Texas Instruments 4GS Carbon Dioxide Sensor
Installation, Set-up and Calibration Manual

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4GS Carbon Dioxide Gas Sensor Installation and Operation Overview

This procedure will allow you to perform the standard field installation for the 4GS Sensor. If the sensor is not operating correctly after completing this procedure, repairs at an authorized repair location will be required.

READ THIS ENTIRE MANUAL BEFORE PROCEEDING. Failure to follow this procedure may cause unreliable sensor operation or may cause permanent damage to the unit.

Part Numbering System

Your 4GS Gas Sensor is available in a variety of standard configurations, or with any of several optional features. Each of the standard configurations and options are described in **Tables 1 & 2**. Although the standard configured 4GS is preset at the factory, each unit can be easily adjusted by the OEM/field user to any ppm range from 300 to 5000. This user can also easily select either the 4-20mA output mode or the voltage output mode. To confirm which configuration you have purchased, refer to the model number on the back of the sensor.

Table 1 4GS Standard Configurations

Part Number	*Description*
4GS-1	**Standard HVAC configuration, 0-2K range, voltage output, wall mount case. Range and outputs are software adjustable.**
4GS-2	**See description below.**
4GS-DM-KIT (Available separately)	**Duct mount kit with aspiration box, venturi tube and mounting hardware.**
4GS-PT-KIT (available separately)	**Pitot tube kit with pitot tube, vinyl tubing, filter and mounting hardware.**

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The 4GS-2 model comes with several optional features. To order this product in a configuration that will suit your application, please consult **Table 2**.

Table 2

4GS-2-2 C D R

Sensor	*Type*	*Sensing Range*	*Case*	*Display*	*Relay*
4GS	**-2**: Custom config. of the 4GS	**2**: 0-2K ppm **5**: 0-5K ppm	**C** - wall mount case *Blank for unit without a case*	**D** - front panel display (LCD) *Blank for no display*	**R** - relay output *Blank for no relay*

Table 3 Specifications

Sensing Method	NDIR - Non Dispersive Infrared.
Gas sampling mode	Pump and/or diffusion capability.
Sensing Range	0-2000 ppm or 0-5000 ppm.
Accuracy	• > 1500 ppm: +/- 5%. • 0-1500 ppm: +/- 75 ppm. (readings @ standard pressure 760 mm Hg & 25°C).
Pressure effect	0.19% of reading per mm Hg.
Repeatability	+/- 8 ppm.
Warm up time	< 90 seconds.
Response time **@ 500 ml/min flow rate**	<30 seconds to 63% of step change. <60 seconds to 100% of step change.
Calibration interval	3 years recommended. NO calibration on installation.
Output voltage	Linearized 0-10V standard, 1K Ohm output impedance.
Output options	• 0-5V, 0-10V software adjustable linear outputs. • 4-20mA current loop: hardware adjustable. • LCD: 2-line, alpha-numeric ppm display. • User defined upper ppm setting from 300 ppm to 5K ppm, software adjustable in 100 ppm increments via LCD or Interface Keypad. • Relay output: trip point is software adjustable in 100 ppm increments from 300 to 5K using LCD or Interface Keypad (factory set at 1000 ppm).
Relay output	Output values from 10 mA to 500 mA @ 24 VAC or 30 VDC.
Output relay de-actuation	100 ppm below relay set point.
Power requirements	24V AC/DC Nominal, < 3W.
Field calibration adjustment, *quick*	Zero ppm gas calibration via keyswitch on PWB.
Field calibration interface, full	Zero and Span calibration: user definable via menu driven software at LCD or Interface Keypad.
Operating temperature range	0°C to +50°C.
Maximum temperature variation	5 ppm/°C over operating temperature.
Operating humidity range	5-95 %, non-condensing.
Storage temperature range	-40°C to +70°C. Display version: -20°C to +70°C.
Dimensions (case)	Approx. 3.84” x 3.84” x 1.085”.
Materials	Case - ABS, UL94VO.
Patents	Patents Pending.

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Sensor Installation

Overview of the Installation Process

This manual will show you how to perform these steps for installation:

- Identify the mounting location
- Identify the sensor model you are installing
- Prepare the wires for termination
- Install the sensor back plate
- Terminate the wires to the sensor terminal strip
- Install the sensor front case

Step 1: Choosing a location

Your Texas Instruments CO_2 gas sensor is designed to be wall mounted. Direct exposure to people's breath, or to incoming ventilation air will bias the CO_2 sample concentration reading in the space to be monitored. Some points to remember:

- Select a mounting location with good air circulation within the area to be monitored
- Select a mounting location that is not near ventilation inlets, doors, windows, or other fresh air entry points
- Select a location that experiences representative concentrations of people for the area (e.g. not right above a water cooler or above a copy machine)
- Select a location at least 4 1/2 feet above the floor.

Your sensor has been designed for long life in standard building environments. Extreme conditions could cause the performance to deteriorate.

Avoid locations subject to the following conditions:

- Moisture condensing
- Liquid splashing or soaking
- Strong fumes from cleaning solutions or other chemicals (acids, ammonia, etc.)
- High or low temperature extremes

Step 2: Preparing to Install the 4GS Sensor

Assemble the following materials prior to beginning installation:

- 4GS Sensor including wall mounting back plate
- Hand tools (screwdriver, drill with 2" hole saw, wire strippers)
- Volt Ohm Meter (VOM)
- 2 self tapping screws:

US Junction Box mount	#6 x 1/2"
European Junction Box mount	3.5 x 12mm
Drywall Mount	Match to wall anchors used

This procedure assumes that:

- Wiring that meets your system requirements and local codes has been run to the installation point
- The sensor will be mounted to a wall
- The sensor will be attached to a junction box, or by other adequate attachments to drywall, plaster or wood construction using appropriate mounting hardware. Please refer to the **Simplified Installation Instructions** .

Step 3: Wall Mounting Back Plate Installation

When directly wall mounted, **the 4GS requires a 2" diameter access hole** in the wall to which it is mounted. Alternatively, if the sensor is mounted to a standard junction box, the necessary clearance is provided by the junction box.

The 4GS sensor is shipped from the factory with the case front and back plate mated. They snap together and also have a small security screw installed. Remove the screw and retain for later use. Unsnap the case parts by gently prying apart.

For direct wall mount applications,

- Ensure that a 2" diameter hole is provided . The sensor wiring must be routed through this hole.
- Note the molded in arrows in the back plate. Ensure that either one is pointing up.
- Using the backplate as a template, mark the required screw holes to attach the sensor back plate. Drill these holes and use anchors or other appropriate means to securely mount the sensor back plate to the wall.
- Route the sensor wires through the center hole of the backplate.
- Securely screw the back plate in place.

For junction box mounting applications

- Choose the proper wall mounting back plate for your application. Sizes to fit both European and US junction boxes are available.
- Route the sensor wires through the center hole of the backplate.

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- Note the molded in arrows in the back plate. Align the screw holes to the junction box while ensuring that one molded in arrow is pointing up.
- Securely screw the back plate to the junction box. **CAUTION**: Mounting screws should be snug. If backplate is bent by over-tight screws, front cover may not latch!

Step 4: Electrical Installation

IMPORTANT: Read these wiring instructions carefully. Make all electrical connections as illustrated. Wiring errors may cause permanent damage to your CO_2 Sensor.

- Electrical connection of your 4GS sensor requires size 18 to 22 AWG wires. At a minimum, four wires are required: two wires are required for power and two wires to carry the signal from the sensor.
- Disconnect wiring electrical power. Trim all wires so 6" to 8" extends from the junction box or wall opening. Strip insulation from all wires so 1/4" of conductor is exposed. Label each wire for reference later.

CAUTION: Be sure all electricity is disconnected before attaching the wires to the sensor. Terminate the leads/ wires for input power and sensor outputs to the terminal strip on the sensor according to the chart below.

Position	Wire	Comments
1	24VAC/ DC In	1/2 wave AC rectifier.
2	24VAC/ DC Common	Sensor common.
3	Relay	Optional.
4	Relay	Optional.
5	CO_2 Signal Output	Linearized voltage output, or selectable 4-20mA current loop output.
6	CO_2 Signal Common	CO_2 Common, or selectable 4-20 mA current loop return.

*Step 5: 4-20mA Current Loop Output Selection - **Optional Step***

The 4GS-4 sensor is factory preset to the 4-20mA output configuration, while 4GS-1,2 & 3 are preset to the voltage output configuration. To select the alternate output configuration, first locate the "jumper" found next to the top, left side of the terminal strip. By moving this jumper to its alternate position, you will select the alternate output. Your selection will be indicated by either an "I" (current mode) or "V" (voltage mode), as printed next to the jumper on the circuit board protective cover.

Step 6: Installing the Sensor Front Case

Display models have an LCD contrast adjustment. On the sensor, locate and adjust the potentiometer labeled Display Adjust until the contrast is correct for your application.

The 4GS sensor front case is a snap mount design. Additionally, there is a security screw that provides extra impact resistance.

- Orient the sensor so that the ventilation slots are facing the floor
- Snap the front cover onto the back plate
- Re-install the security screw

CALIBRATION PROCEDURE

Overview

This procedure will allow you to perform field calibration for the 4GS gas sensor. This procedure is conducted as part of a scheduled maintenance program. It is not intended as a repair or rework procedure.

Words that are written in ***BOLD ITALICS*** denote actual keyswitches on the Interface Keypad or sensor main board. Words that are **CAPITALIZED BOLD FACE** are actual commands that will be displayed on the sensor LCD or the Interface Keypad LCD.

Equipment Requirements for Calibration

- A copy of this manual.
- Zero calibration gas.
- Span calibration gas.
- A gas regulator - to control the flow of calibration gas at .5 liters per minute. The regulator is used for both gas bottles.
- Tubing - to connect the regulator to the calibration inlet of the sensor.
- The Interface Keypad - This tool is necessary if you do not have a display version of the 4GS.
- A watch.
- A paperclip.

Warning: USE CAUTION WHEN WORKING WITH LIVE ELECTRICAL WIRING.

- Do not hang a calibration gas bottle from the sensor.

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- Do not attempt to use any other keyswitch device to calibrate the sensor.

Violation of these warnings may void the unit's warranty.

Getting Started

READ THIS ENTIRE MANUAL BEFORE BEGINNING THE CALIBRATION PROCEDURE. Incorrect calibration will cause unreliable sensor operation and may cause permanent damage to the unit.

If the sensor is not operating correctly after completing this procedure, repairs at an authorized repair location will be required.

ABOUT THE EQUIPMENT

In preparation for calibration, you must determine which model 4GS sensor is to be calibrated. There are two basic models - display models with an LCD display on the face of the sensor case and the non-display model with a blank or plain front cover.

Calibrating the 4GS or setting the user defined parameters requires inputs via two keyswitches or keys. On display models, these keys may be found on the back of the main board. Non-display models do not have keyswitches on the main board.

All 4GS models have a 16 pin connector on the left side of the unit, behind a small, user serviceable plastic panel. This connector allows connection of the Interface Keypad . This keypad contains both an LCD display and the two required keyswitches. All 4GS units can be serviced with the Interface Keypad. All non-display units require this accessory for calibration. A display-type unit may be calibrated with the Interface Keypad or with it's on board keyswitches.

All adjustments on the 4GS are carried out via the use of two keyswitches clearly marked "***Enter***" and "***Select***". The keyswitches on the Interface Keypad and those on the main board of a display model are identical in function. Any instructions in this manual referring to a keyswitch can be performed on the Interface Keypad or the main board keyswitches.

Preparing for Calibration if you are using the TI Interface Keypad

The Interface Keypad is connected to the 4GS via a 16 pin header connector located on the left side of the sensor. This connector is located behind a protective plastic cover. The cover must be removed to gain access to the connector. Then the ribbon cable from the Interface Keypad must be connected to the 4GS. Here are the steps to follow:

Remove the protective cover by using a small screwdriver or equivalent tool to pry the cover out. Retain the cover for later re-installation.

Note the ridge on the side of the plug connector. This must be facing away from the circuit board during mating to ensure proper polarity. Plug in the connector. This step will automatically place the sensor into Menu Operation Mode.

When the user service operation is completed, be sure to re-install the protective cover.

Preparing for Calibration of a Display Model via use of the On Board Keyswitches

To access the on board keyswitches, you must remove the front case from the wall mounting plate. This will provide access to the rear of the main board where the on board keyswitches are located. Here are the steps to follow.

Remove the small, steel screw located in the bottom of the case front. Retain the screw for later re-installation.

The case front is held to the wall mounting plate by four snaps. The case should be gently pried off the back plate. This may be done with hand pressure or by gently prying with a small screwdriver or equivalent tool, taking care not to mar the case.

The sensor is wired to the system via a terminal strip. These connections must be maintained during user service. Warning: Use appropriate caution when handling these live circuits.

The sensor must be placed into Menu Operation Mode. This is done by moving a "jumper" which is found next to the top, right-side of the terminal strip.

When user servicing is complete, the jumper must be returned to its original position and the case re-installed.

User Servicing - The 4GS Menu System

The LCD (either on the 4GS or the Interface Keypad) provides a menu-type system to guide the user through any required user servicing. The SELECT keyswitch is used to move the cursor. The cursor looks like this: >. Each time the SELECT key is pressed, the

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cursor moves to the next menu option. The ***Enter*** key allows the user to confirm a menu choice. When the ***Enter*** key is pressed, the choice is saved and a new value is now operational.

The menu provides access to 4 Main Sections: Calibration, Select Full Span Maximum Voltage Value, Set Relay Close Value and Set Span Value. Each of these main sections has a series of menu choices. The basic structure of the menu system looks like this:

The menu choice that appears in **BOLDFACE** appears on the 4GS LCD. It is followed by an expanded description.

Main Menu	Menu Level #1	Menu Level #2	Menu Level #2
CAL - Calibration	**ZERO** - Calibrate Zero Point	**SAVE** - Save new Zero value - or **EX** - Return to Main Menu	
	SPAN - Calibrate Span Point	**+/ -** Choose calibration gas concentration	**SAVE** - Save new Span value - or **EX** - Return to Main Menu
	EX - Return to Previous Menu		
VOLT - Select Full Scale Maximum Voltage Value	± - Select 5VDC or 10VDC output, and **SAVE** - save new setting		
RP - Set Relay Actuation point	± - Select relay closure value, and **SAVE** - Save new setting		
MX - Setting the CO_2 Concentration where full output is delivered	± - Select maximum concentration value and **SAVE** - Save new setting		

Instructions for User Service

Calibration: Calibrate Zero Point

Step 1. Prepare the zero gas bottle. This includes screwing the regulator onto the bottle and attaching the tubing to the hose barb on the end of the regulator.

Step 2. Locate the sensor to be calibrated. Locate the gas inlet in a small round hole in the bottom edge of the case front. Remove the protective cap from the gas inlet. Retain this cap for re-use. Connect the tubing from the zero gas bottle to the sensor gas inlet. Use of excessive force while attaching tubing will damage the sensor. Ensure the unit has been powered up a minimum of 90 seconds prior to Step 3. The sensor uses this time to stabilize its reading: premature action may result in an inaccurate calibration.

Step 3. The screen should display the main menu.

	M	X	>	C	A	L	
	R	P		V	O	L	T

Step 4.

By pressing the ***Select*** keyswitch, move the cursor "**>**" (scroll) until it points to **CAL** and press Enter.

Your display should look like this:

>	E	X		Z	E	R	O
	E	X		S	P	A	N

Scroll to **ZERO** and press ***Enter***. Display should read

F	L	O	W		G	A	S
	E	X	>	S	A	V	E

Flow the zero gas for 5 minutes. Press ***Enter*** with the cursor pointing to **SAVE**. The display will briefly read complete, and then return to the main menu.

Step 5. Shut off the zero gas. Disconnect the gas tubing from the sensor. Re-install the protective cap on the gas inlet. Your zero calibration is finished.

Step 6. If this is the last procedure that you are performing, return the sensor to normal operation mode by repositioning the jumper or disconnecting the Interface Keypad. Return the case to its original condition with all covers in place.

Calibration: Non-Menu, Calibrate Zero Point

This alternate zero calibration procedure is a quick and easy procedure to re-zero the sensor. Any 4GS unit can be re-zeroed with this procedure.

Step 1. Power up the unit and wait 90 seconds. Locate the gas inlet in a small round hole in the bottom edge of the case front. Remove the protective cap from the gas inlet. Retain this cap for re-use. Attach the Zero gas tubing to the sensor gas inlet and flow gas for 5 minutes.

Step 2. Two access holes are located on the left side of the case. The bottom hole is the access hole for the Re-zero key. Straighten a paper clip and insert into the access hole and depress the

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keyswitch inside. The LED in the status hole above should begin to blink. Depress the keyswitch again and the LED should cease blinking. The second keyswitch actuation will complete the zero calibration. If the zero calibration keyswitch is not pressed within eleven blinks, the LED will stop blinking and the zero calibration will not be complete. This feature serves as a fail-safe. The prior values will not change.

Step 3. Turn off the zero gas and disconnect it from the CO_2 sensor. Re-install the protective cap on the gas inlet. Your zero calibration is complete.

Calibration: Calibrate Span Point

Step 1. Power up the unit and wait 90 seconds. Locate the gas inlet in a small round hole in the bottom edge of the case front. Remove the protective cap from the gas inlet. Retain this cap for re-use. Attach the span gas tubing to the sensor gas inlet.

Step 2. The display should read:

	M	X	>	C	A	L	
	R	P		V	O	L	T

By pressing the ***Select*** keyswitch, move the cursor "**>**" (scroll) to point to **SPAN**. Press ***Enter***. The menu will look something like this:

	+			0	8	0	0
	-		>	C	O	N	T

The number in the upper right is the CO_2 concentration of the span gas. It is factory preset at 800 ppm. If the last user of the sensor used another value, this will be displayed.

Step 3. If you are using high accuracy calibration gas not purchased from TI, and need to adjust the span to a different value (concentration must be between 750 and 850 PPM), scroll to (**+**) or (**-**) by using the ***Select*** key, then, by repeatedly pressing the ***Enter*** key, adjust the LCD display value to match the span gas value. Then, scroll to **CONT**. Press ***Enter***. The screen should read

F	L	O	W		G	A	S
	E	X	>	S	A	V	E

Flow the span gas for 5 minutes. Select **SAVE** and press the ***Enter*** key. The display will briefly display complete, and then return to the main menu.

Step 4. Shut off the span gas. Disconnect the gas tubing from the sensor. Re-install the protective cap on the gas inlet. Your span calibration is finished.

Step 5. If this is the last procedure that you are performing, return the sensor to normal operation mode by repositioning the jumper or disconnecting the Interface Keypad. Return the case to its original condition with all covers in place.

Setting the Relay Point - **RP**

The 4GS CO_2 Sensor is designed to operate as a part of a control system. Some models contain a relay output. The CO_2 PPM value at which the relay circuit closes is the Relay Set Point. This output is typically used to begin or end a function (i.e. actuate a ventilation damper).

Step 1. Enter the Menu Operation Mode. (See the Preparing for Calibration section above). From the main menu screen

	M	X		C	A	L	
>	R	P		V	O	L	T

Scroll to **RP** and press the ***Enter*** key.

Step 2. The menu will look something like this:

	+			1	0	0	0
	-		>	S	A	V	E

The number in the upper right is the CO_2 concentration at which the relay will close. It is factory preset at 1000 ppm. If the last user of the sensor used another value, this will be displayed.

Step 3. If the relay set point value is acceptable, skip to step 4. If you wish to change the relay set point value, ***Select*** (**+**) or (**-**) and press ***Enter*** to alter the value. The relay set point value will change in 100 PPM intervals each time you press the ***Enter*** key. You cannot choose a relay set point value above the saved **MX** value or below 300 PPM.

Step 4. When you have set the relay point that is correct for your application, scroll to SAVE and press ***Enter***. You have now completed this procedure.

Setting the Maximum Output PPM Level - **MX**

The 4GS CO_2 Sensor is designed to operate as a part of a control system. Every unit can be adjusted to provide its full electrical output at a CO_2 value of your choice. This setting is typically adjusted to provide full actuation of a damper or other final control device at a CO_2 concentration less than the sensor's full scale capability.

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Step 1. Enter the Menu Operation Mode. (See the Preparing for Calibration section above). From the main menu,

>	M	X		C	A	L	
	R	P		V	O	L	T

scroll to MX and press the ***Enter*** key.

Step 2. The menu should look something like this:

	+			2	0	0	0
	-		>	S	A	V	E

The number in the upper right is the CO_2 concentration at which the sensor delivers full output. It is factory preset at 2000 ppm. If the last user of the sensor used another value, this will be displayed.

Step 3. If the maximum output value is acceptable, skip to step 4. If you wish to change the maximum output value, ***Select*** (**+**) or (**-**) and press Enter to alter the value. The maximum output value will change in 100 PPM intervals each time you press the ***Enter*** key. You cannot choose a maximum output value above the 5000PPM or below 300 PPM.

Step 4. When the screen displays the correct value, scroll to **SAVE** and press ***Enter.*** Note: If you save a maximum output value that is less than the current relay point, the relay point will automatically be changed to the maximum output value.

Step 5. If this is the last procedure that you are performing, return the sensor to normal operation mode by repositioning the jumper or disconnecting the Interface Keypad. Return the case to its original condition with all covers in place.

Setting the Full Scale Maximum Voltage Value - **VOLT**

The 4GS CO_2 Sensor is designed to operate as a part of a control system. Every unit can be adjusted to provide 2 different full scale output voltages. The 4GS can be configured to provide 0-5VDC and 0-10VDC outputs.

Step 1. Enter the Menu Operation Mode. (See the Preparing for Calibration section above). From the main menu screen,

	M	X		C	A	L	
	R	P	>	V	O	L	T

scroll to **VOLT** and press the ***Enter*** key.

Step 2. Your screen should look something like this:

					1	0	V
	-		>	S	A	V	E

The number in the upper right is the DC voltage which the sensor delivers at full output. It is factory preset at 10VDC. If the last user of the sensor used another value, this will be displayed.

Step 3. If the maximum output value is acceptable, skip to step 4. If you wish to change the maximum output value, ***Select*** (**+**) or (**-**) and press ***Enter*** to alter the value. The maximum output value will scroll to one of the two choices (5V or 10V) each time you press the ***Enter*** key. **NOTE:** *10V must be selected when using the 4-20mA (jumper selected) output*.

Step 4. When the screen displays the correct value, scroll to **SAVE** and press ***Enter.***

Step 5. If this is the last procedure that you are performing, return the sensor to normal operation mode by repositioning the jumper or disconnecting the Interface Keypad. Return the case to its original condition with all covers in place.

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Troubleshooting

Condition	Next Action	How To
Cannot calibrate the sensor.	Full cold restart.	Unplug sensor power connector. Leave unit unpowered for 1 full minute. Plug in sensor power connector and allow unit to warm-up for 5 full minutes before attempting calibration procedure.
Cannot locate all required calibration equipment.	Do not attempt to calibrate unit.	See table on last page for calibration parts list.
I have calibration gas available, but it is not gas purchased through TI.	TI calibration gases for these sensors are custom mixed to +/- 3% ppm. Use of gases other than TI gases need to be mixed to an equal precision or they will most likely cause the unit to operate unreliably.	See table on last page for calibration parts list.

Calibration component parts

Part Number	Description
CAL-A-0-5	Zero Gas Bottle, 100% Nitrogen, High Pressure, disposable 17 liter size. (Approx. 5 Calibration capacity). Requires Regulator.
CAL-A-800-5	Span Gas Bottle, 800 PPM CO_2, High Pressure, disposable 17 liter size. (Approx. 5 Calibration capacity). Requires Regulator.
CAL-A-0-35	Zero Gas Bottle, 100% Nitrogen, High Pressure, disposable 105 liter size. (Approx. 35 Calibration capacity). Requires Regulator.
CAL-A-800-35	Span Gas Bottle, 800 PPM CO_2, High Pressure, disposable 105 liter size. (Approx. 35 Calibration capacity). Requires Regulator.
CAL-A-Tube	.125” Thin wall tubing with adapter for CAL-A-REG-5 and CAL-A-REG-35. 6’ length.
CAL-A-REG-5	Regulator for use with CAL-A-0-5 and CAL-A-800-5 gas bottles.
CAL-A-REG-35	Regulator for use with CAL-A-0-35 and CAL-A-800-35 gas bottles.
CAL-A-Case -5	Carrying case for 2 17 liter bottles, regulator, tubing and Interface Keypad (CAL-B-Key).
CAL-A-Case-35	Carrying case for 2 105 liter bottles, regulator, tubing and Interface Keypad (CAL-B-Key).
CAL-B-Key	Interface Keypad with hook-up cable.
CAL-B-Kit-5	Complete calibration kit with all necessary parts to calibrate approximately 5 sensors, includes carrying case.
CAL-B-Kit-35	Complete calibration kit with all necessary parts to calibrate approximately 35 sensors, includes carrying case.

To order Calibration Parts and Supplies, please call TI at (508) 236-1148 or fax TI at (508) 236-1961.

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FCC and CE Compliance

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modification not expressly approved by Texas Instruments Inc. for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits of a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference in which case the user will be required to correct the interference at his own expense.

Application Note

Important Notice: Texas Instruments (TI) reserves the right to make changes to or discontinue any product or service identified in this publication without notice. TI advises its customers to obtain the latest version of the relevant information to verify, before placing orders, that the information being relied upon is current.

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Questions regarding maintenance, care or replacement of parts for the TI 4GS CO_2 sensor should be directed to (508) 236-1148, fax: (508) 236-1961 or e-mail: gas-sensor@ti.com. Be sure to visit our Web Site at: **www.tisensors.com**. This instruction packet may also be found on our website.

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