

RAM 4021-DPX

Operation Manual



GfG Instrumentation

Worldwide Manufacturer of Gas Detection Solutions

ABL 4021-DPX /RAM 4021-DPX

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ABL-4021-DPX

FOR YOUR SAFETY

Like any piece of complex equipment, the GfG Instrumentation ABL-4021 series will do the job it was designed to do, only if it is used and serviced in accordance with the manufacturer's instructions. All individuals who have or will have the responsibility of servicing the equipment must carefully read this manual. The warranties made by GfG Instrumentation with regards to this instrument are voided, if the product is not used and serviced in accordance with the instructions in this manual. Please protect yourself and others who depend on this instrument by following these instructions. The above does not alter statements regarding GfG Instrumentation's warranties and conditions of sale and delivery.

DESCRIPTION

General

This unit is designed to provide continuous monitoring of the carbon monoxide and dew point in the levels of breathing air.

The instrument's electronics are enclosed in a NEMA-4X polycarbonate case. The case is corrosion resistant, positively pressurized by the compressor supply line, and sealed except for a bleed hole to exhaust the compressor's air. The unit operates on 110 V AC power. It comes equipped with a case mounted horn that may be disconnected if not required.

Calibration adjustment controls are not necessary since they are automatically performed by the microprocessor.

The carbon monoxide chemical cell has a life expectancy of two to three years with a 30-day calibration check recommended. The dew point sensor has an expected life of two years and requires no calibration due to its auto calibration feature.

SET UP PROCEDURE

By briefly depressing the top button (see Figure 1) it is possible to cycle through the set up parameters. Each time the top button is depressed the display screen will identify the selected mode and will indicate the current set up. The lower button will change the parameter.

Set-up modes

The following outlines the set up modes and options available. In each mode it is possible to change the set up using the lower button.

DPalm xx.x Dew point high relay setting (dryer failure alarm)

DLalm xx.x Dew point low relay setting (dryer control)

COalm xx The alarm point in parts per million is displayed

CO XX The part per million of carbon monoxide to be used for calibration is displayed (i.e. CO - 20).

The carbon monoxide test gas concentration may be set from 5 to 100 PPM and is factory set to 20 PPM. It is important to use the same test gas as the "CAL" setting, otherwise the calibration will fail because of the error protection feature.

NOTE: This set-up must be identical to the PPM concentration of the carbon monoxide calibration gas (5 - 50 PPM CO).

CO rly	The carbon monoxide alarm relay (remote) can be made operational (ON) or disabled (OFF) in this mode. Setting the relay ON or OFF permits any auxiliary device connected to them to be shut off if not needed. During calibration it will be automatically shut off.
DP rly	Setting the relay ON or OFF permits any auxiliary device connected to them to be shut off if not needed. Factory set to 10 degrees F. (Dryer failure relay)
DL rly	Used for controlling a dryer to cycle on/off at the set point determined-factory set to -4 degrees F.
Test Mode	Activates alarms and solid squares on LED readout when lower button is pushed. The alarm horn and light relays may be tested by pressing and holding the bottom button while in alarm test Set-Up mode. When testing an auxiliary horn, be sure the relay is turned ON.

OPERATION

Plug the unit into 110 V AC and the display will show introductory messages and a warm-up countdown. If the unit does not power up, check the electrical connections and try re-plugging the unit. If the start up does not occur, call the factory.

After the warm-up countdown, the instrument will display CO readings. The air regulator may be adjusted at any time to set the flow level from 0.5 to 0.9 CFH. If the low flow indication shows on the display, increase the flow to 1 CFH; and then drop the flow to operational range of .5 to .8 CFH.

CAUTION: If the unit is reading a carbon monoxide gas level, do not make any adjustment for a few hours until the unit has settled in. If calibration is attempted within the first fifteen minutes, a **TOO SOON** message will occur on the display.

If the carbon monoxide gas readings remain high or below zero (-0), recalibration may be needed. We also recommend checking the compressor's air intake, which may be the cause for high readings. Outside air intake is recommended - but can easily be contaminated by furnace exhaust, building vents, parking lots, etc. Intakes within the building are to be avoided because they often contain low PPM level carbon monoxide.

CALIBRATION

Calibration carbon monoxide sensor with co test gas (recommended every 30 days)

Although the unit was calibrated at the factory, it may require carbon monoxide recalibration due to handling. The only way to assure the sensor is operating properly is to place gas on it.

To calibrate the unit with carbon monoxide test gas, shut off the air from the compressor supply line with the regulator, and after a few moments, a "LOW FLOW" message will appear. Assemble the calibration kit and connect the tank of test gas to the cal port connector on the instrument. Open the gas valve (use only the fixed flow regulator provided with the calibration kit). The display will read "CAL GAS DETECTED" then "WAIT" and a 60 second count down will begin.

If the compressor air supply line was not shut off, a message will appear "SUPPLY OFF". If such a message occurs, shut off the supply air; and then begin the cal process again to activate the cal port switch.

After 60 seconds a gas reading will appear. With 20 PPM test gas applied the gas reading should be 20. The number will move around as it's self adjusting, then will automatically set.

After the unit auto calibrates, a message will appear "CAL PASSED", then "REMOVE CAL GAS", indicating that the CO gain adjustment has been set for 20 PPM. This prompts the calibrator to remove test gas. Then the message "LOW FLOW" appears, prompting the calibrator to turn the supply on at the regulator.

If an incorrect gas concentration is used or the sensor and/or instrument is not properly functioning, the auto calibration process will not finish. If the instrument fails to complete the auto calibration process within 5-6 minutes, remove the calibration gas, and the message will appear "CAL FAILED". This affords improper calibration protection and an effort should be made to understand why it did not calibrate (see troubleshooting section for assistance).

Dew point sensor calibration

The dew point sensor does not require external calibration, and will self calibrate periodically, or after a severe humidity change. During the dew point sensor auto-calibration, the dew point reading will remain constant on the display until auto calibration is complete. The auto calibration process will take 2-3 minutes.

"ZERO/CAL" adjustment for carbon monoxide

The carbon monoxide read-out (PPM) will be "0" in the absence of carbon monoxide. This "0" can be calibrated by flowing clean air over the sensor and activating the zero/cal set switch.

The "ZERO/CAL" set switch is activated through a small hole in the face of the unit using a wire activator (bent paper clip).

Two methods are available to check or set the carbon monoxide ZERO/CAL.

With normal flow through the unit from a clean air supply, depress the ZERO/CAL switch and the message "ZEROING" will appear. Hold closed until the "ZEROING" message disappears, immediately release the switch, and the instrument will self zero.

If the supply air is clean the display will show a 0 reading for CO which indicates that a zero setting has been accepted and is now in use. If the supply line has more than a trace of carbon monoxide the following message will appear "ZERO CO", alternating with a flashing CO alarm light. The instrument is informing the user that it will not zero calibrate because of bad Zero air, and it will use its previously zeroed cal setting.

CAUTION: Be sure that the cylinder in use is "zero gas" impurity free air (standard air) when zero initializing.

A second method for zeroing is to place zero test gas (Impurity Free Air) in the cal port in the same manner described previously with calibration gas, and the unit will initiate its calibration gas routine. However, the unit expects that 20 PPM CO is being applied in the cal port unless the zero set switch is pushed. Check to see that the message now says "ZEROING" instead of "WAIT" with the 60 second countdown. At any time during the countdown the zero may be pushed to program the unit for zero gas. If the set switch is not pushed, the instrument will fail to calibrate. This is the error protection. After the zero button is depressed, a "ZEROING" message appears. Then release the zero set switch, and the instrument will self zero.

MAINTENANCE (qualified technicians only)

NOTE: Except for the sensors, all internal parts are to be serviced only by the factory or its authorized agents.

Dew point sensor replacement

The dew point sensor is shipped to you pre-calibrated, no user calibration is required. The dew point sensor will auto calibrate periodically during use. To replace, disconnect the power to the instrument, unplug and remove the sensor from the dew point sensor chamber, replace sensor and reassemble.

Carbon monoxide sensor replacement

When CO test gas fails to show a gas response during calibration, or the instrument will not complete calibration, a new sensor is required. Most CO sensors will last from one and one-half years to three years.

To replace the sensor, disconnect the power to the unit; remove the four corner screws, and the electronics front cover. Next remove the three screws that hold the grey sensor block and unplug the CO sensor from its socket. Replace with a new sensor after **being sure that the shorting wire is removed** from the new sensor. Reassemble the unit and reconnect to power. Let the new sensor settle in for at least an hour prior to calibrating.

A NEW CO SENSOR MUST BE ZEROED

When calibrating a new CO sensor, perform a zero operation prior to a gas calibration procedure. Caution needs to be taken that the air is free of carbon monoxide. If the supply line is not CO free, then obtain a tank of Impurity Free Air test gas from GfG (stock number 7802-006).

After a successful zero operation is completed, supply 20 PPM cal gas (or another value selected in the Set Up mode) and perform a gas calibration on the instrument (see calibration section).

TROUBLESHOOTING SECTION

The CO zero cal will not set if there is CO gas present, or if the sensor or electronics are bad. Also, the instrument will not calibrate if the incorrect concentration of CO gas is used, or the sensor is bad or beyond its useable life.

With 20 PPM CO cal gas the instrument will read close to 20 during calibration. If the computer cannot auto adjust the readout to 0 (zero) or 20 (cal), the zero or calibration will fail.

Zero fail during CO calibration

If a failure occurs during CO zero cal, the zero air should be questioned for CO content.

Another zero operation with known good zero air should be performed. If the instrument still fails to zero, the unit is malfunctioning, call the factory for further instructions.

Calibration gas fail during CO calibration

With 20 CO PPM gas on the unit the reading should reach 20. If the reading does not reach 20, use the appropriate following procedure.

1. If the gas reading does not show any increase when the gas is applied, probably the sensor is expired or the test gas is zero concentration. Check hose connections to assure gas is flowing into the sensor chamber.
2. If the reading is close to 20, a zero calibration procedure with known zero gas will probably correct the problem. If the unit was zeroed with more than a couple PPM of CO, the cal will fail when 20 PPM test gas is applied.

ACCESSORIES AND FIELD REPLACEMENT PARTS

ACCESSORIES

7750-001	Calibration kit (includes calibration connector and 20 ppm test gas 34 L)
2605-002	High pressure regulator (5,000 PSI)
1301-002	Remote horn – 110 V AC

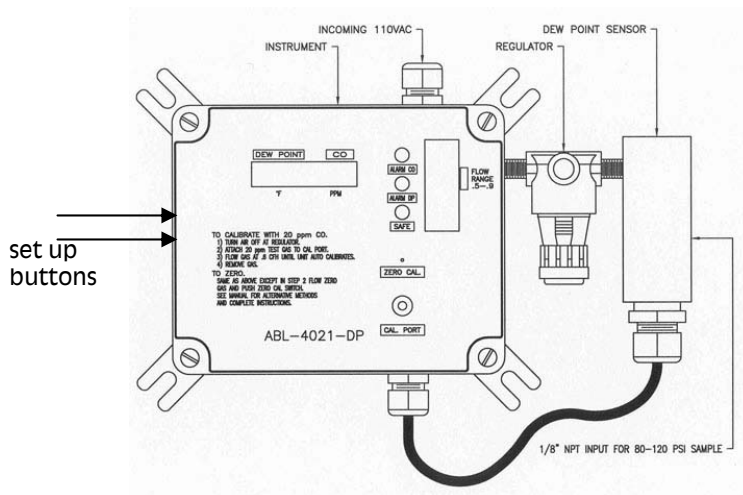
REPLACEMENT PARTS

5503-020	Sensor – chemical cell
1702-DPX	Dew point sensor
7750-004	Calibration regulator
7802-001	Test gas - 20 ppm carbon monoxide 34 L
7802-006	Test gas - impurity free Air 34 L (zero gas)

EQUIPMENT TECHNICAL DATA

Gases detected	Carbon monoxide	Dew point
Sensor	Electro chemical cell	Solid state Thin film type
Meter scale	0 to 100 ppm CO	-80 °F to +40 °F
Response	90% max. in 20 sec	N/A
Accuracy	+/- 1ppm	+/- 3 °F
Expected sensor life	3 years	2 years
CO sensor warranty	1 year	
Operating temperature range (sample air)	+ 32 °F to 105 °F	
Factory set adjustable alarm points	10ppm CO	(H) + 10 °F(L) -4 °F
Standard inlet pressure	½" feed - 80 to 120 psig	
Sample flow rate	0.5 cubic feet of air per hour (scfh)	
Relays		
1 – CO alarm	250 V AC/30 V DC @7A	
2 – dew point		
Power source	110 V AC @ 1A	
Dimensions	7.3 x 5.9 x 4 inches (L x W x H) (185 x 150 x 101 mm)	

FIGURE 1
4021-DPX DIAGRAM

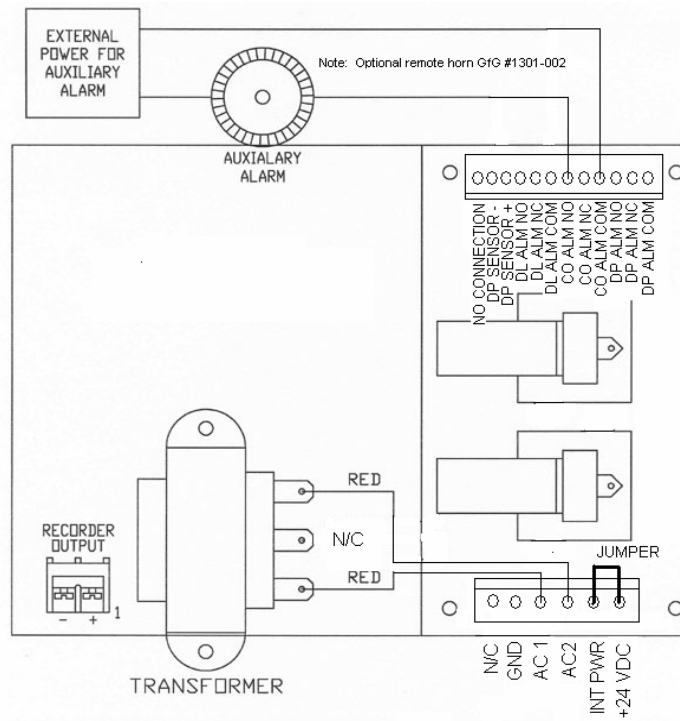


WARRANTY

GFG INSTRUMENTATION, INC., warrants each new electrical product manufactured by it to be free from defective material and workmanship for the purpose intended, for a period of one (1) year from the date of sale to the original purchaser, and agrees to remedy any such defect or to furnish a new part (at the company's option) in exchange for any part of any product of its manufacture which under normal use, and service disclosed such defect; provided the product is delivered by the purchaser to GFG'S factory, intact, for our examination, with all transportation prepaid to our factory, provided that such examination discloses, in our judgment, that it is thus defective.

This warranty does not extend to any products that have been subjected to misuse, neglect, accident, unauthorized modifications, or to use in violation of instructions furnished by us, nor does it extend to products that have been repaired or altered outside of our factory. **This warranty is in lieu of all warranties express or implied and no representative or person is authorized to assume for us any other liability in connection with the sale of our products. All implied warranties are limited to the duration of this written warranty. In no event is GFG INSTRUMENTATION, INC., liable for special, incidental, or consequential damages arising from any breach of warranty of product.**

WIRING DIAGRAM





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