



EC 21

Operations Manual



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For Your Safety

As with any piece of complex equipment, the GfG EC 21 transmitter will do the job it is designed to do only if it is used and serviced in accordance with the manufacturer's instructions. Please protect yourself and your employees by following the instructions in this manual. All individuals who have or will have the responsibility for using and servicing this product must carefully read this manual. The warranties made by GfG with respect to the product are voided if functions or parameters are changed without the permission of GfG. They are also voided if the product is not used and serviced in accordance with the instructions in this manual. Failures or false alarms caused by interfering gases or electrical signals are not part of the warranty obligation. The above does not alter any statements by GfG regarding warranties, conditions of sale and/or delivery.

General Description

The EC 21 transmitter uses an electrochemical sensor to convert a gas concentration into a linear 4–20mA electrical signal, and transmits it over a cable to the controller. It is a simple to connect, loop powered two wire transmitter.

Electrical Connections

The power connector is designed with a “quick disconnect” feature, which simplifies transmitter installation, replacement and service. The connector plug is easily removed from the transmitter by pulling straight up on the top of the power connector. This separates the bottom connection from the wiring connections to the plug. The connector plug is designed to be installed in only one direction (polarized) for safety reasons. Power is connected to the plug of the power connector by securing the stripped ends of the electrical cable using the two screws on the connector plug. Connect the supply wires (10–30 VDC) to the correct terminals on the connector plug (see diagram), and re-attach to the transmitter pc board by pressing back down on the pins from where it was removed.

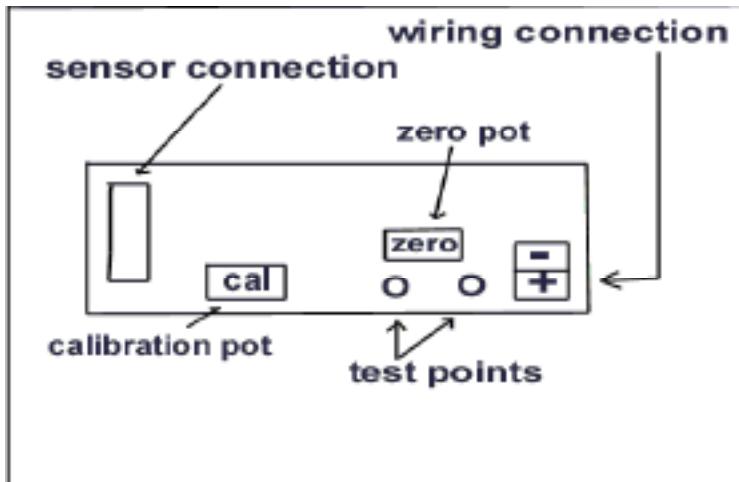
Caution: If the supply wires are reversed on the power connector, the transmitter will produce no current output.

Zero Point Adjustment

The EC 21 transmitter uses a conveniently located set of two test terminals (see diagram) which provide a mV reading that corresponds to the 4–20 mA output. A reading of 40 mV on the test terminals corresponds to 4 mA, and 200 mV corresponds to 20 mA. This feature offers a quick and easy way to verify zero readings and gas response without having to disconnect wires and place current meters in line with the transmitter.

Using a DC voltmeter set to the mV range, place the voltmeter's leads in the 40–200 mV test terminals on the transmitter pc board. The reading should be approximately 40 mV. If you are unsure if the ambient air is clean, flow impurity free air (zero air) into the sensing inlet using a calibration adapter and a 0.5 to 1.0 lpm fixed flow regulator, and allow the mV reading to stabilize. Please contact your GfG sales representative for zero gas or portable gas detector ordering information if necessary. If the mV reading is not 40 mV, then the zero must be adjusted.

To adjust the ZERO to 4mA (40 mV on the test terminals), slowly adjust the zero potentiometer on the transmitter board (see diagram) until a reading of 40 mV on the test terminals is reached (if the zero potentiometer cannot be adjusted to 40 mV, please contact GfG service for detailed instructions). This procedure will set the current output from the transmitter to 4 mA (zero).



Sensitivity Check (Calibration)

The EC 21 transmitter uses a conveniently located set of two test terminals (see diagram) which provide a mV reading that corresponds to the 4-20 mA output. A reading of 40 mV on the test terminals corresponds to 4 mA, and 200 mV corresponds to 20 mA. This feature offers a quick and easy way to verify zero readings and gas response, without having to disconnect wires and place current meters in line with the transmitter.

Using a DC voltmeter set to the mV range, place the voltmeter's leads in the 40–200 mV test terminals on the transmitter pc board. Attach the calibration adapter to the sensing inlet. Flow the correct concentration of calibration gas at 0.5 to 1.0 lpm (please contact your GfG sales representative for calibration gas ordering information if necessary). Allow the gas to flow across the sensor for at least 2 minutes or until the transmitter signal is stable, then check to see that the mV reading is at the correct mV for your sensor type and gas concentration (see chart below).

If the mV reading is not correct, adjust the Span potentiometer slowly until the correct mV reading is obtained (if the span potentiometer cannot be adjusted to the correct mV reading, please contact GfG service for detailed instructions). After the span adjustment is complete, remove the calibration gas and allow the transmitter current output to return to 40 mV (zero).

Percent of Scale to mV Output

% of Detection Scale	mV Output Linear 40–200 mV	Scale Examples			
		0–20	0–100	0–200	0–500
0%	40.0	0	0	0	0
5%	48.0	1	5	10	25
10%	56.0	2	10	20	50
15%	64.0	3	15	30	75
20%	72.0	4	20	40	100
25%	80.0	5	25	50	125
30%	88.0	6	30	60	150
35%	96.0	7	35	70	175
40%	104.0	8	40	80	200
45%	112.0	9	45	90	225
50%	120.0	10	50	100	250
55%	128.0	11	55	110	275
60%	136.0	12	60	120	300
65%	144.0	13	65	130	325
70%	152.0	14	70	140	350
75%	160.0	15	75	150	375
80%	168.0	16	80	160	400
85%	176.0	17	85	170	425
90%	184.0	18	90	180	450
95%	192.0	19	95	190	475
100%	200.0	20	100	200	500

Bold text in the chart above indicates a recommended concentration.

Technical Data

Gas & Detection Range:	Varies by sensor type
Detection principle:	Electrochemical
Gas supply:	Diffusion
Response time T90:	< 30 seconds (depending on sensor type)
Output signal:	4–20mA Linear
Voltage supply:	10–30 VDC
Sensor Cable:	18 AWG 2 conductor shielded
Dimensions	2.625 x 5.25 x 6 in.
Temperature:	-20 to 50° C (most sensor types)
Relative Humidity:	15–95% rh non-condensing

GfG reserves the right to change part number, prices & technical information without notification.

Troubleshooting

Symptom	Possible cause	Solution
No output	<ul style="list-style-type: none">Supply wires reversed	<ul style="list-style-type: none">Check wiring for proper polarity
No voltage to transmitter	<ul style="list-style-type: none">No power	<ul style="list-style-type: none">Check for 10-30 VDC at power connector
No response to gas	<ul style="list-style-type: none">Sensor has expiredSensor wires disconnectedSensor not plugged in correctly	<ul style="list-style-type: none">Replace sensorCheck sensor wiringCheck sensor connection to transmitter pcb
Sensor will not calibrate	<ul style="list-style-type: none">Sensor has expiredIncorrect or bad span gasIncorrect span setting	<ul style="list-style-type: none">Replace sensorUse correct concentration of span gasRefer to chart for correct span setting for transmitter type

Please contact GfG Engineered Fixed Systems department at 734-761-5987 if you need additional help.

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