INTELLIGENT GAS DETECTOR

Gas Detection For Life

GD-70D Series

Features

- **Monitor combustibles, O_2, and a wide range of toxics**
- **Plug and play intelligent sensors retain calibration and sensor data**
- **Common platform (main unit / sensor / pump) for all detection methods**
- **Universal main unit (all sensor types)**
- **Multifunctional sensor unit (new Intelligent sensor)**
- **No internal tubing (main unit) / No coil (pump)**
- **Front access, no tools required, easy sensor and pump replacement**
- **Large size LCD screen**
- **Various communication methods available (4-20mA, LonWorks, and PoE)**
- **Minimal maintenance cost through enhanced troubleshooting firmware functions**
- **Small mounting space**
- **Environmentally friendly**
- **Wide variety of sensors available**

The new Model GD-70D smart gas detection transmitter series sets a new standard for performance, flexibility, and versatility. The GD-70D sample-draw transmitter offers an array of sensor technologies unmatched in the industry, including unique offerings, such as our hydrogen-specific or LEL versions.

The long life high capacity pump and wide variety of sensing elements are replaceable in a few seconds, with no tools required! The smart sensors retain all calibration and sensor-specific data in non-volatile memory, so sensors can be hot-swapped in the field with no programming required. The sensors also retain calibration information, which means they can be conveniently calibrated separate from the transmitter, avoiding transport of calibration gases to field locations. The GD-70D firmware automatically corrects for long-term zero and span “drift” minimizing maintenance and maximizing reliability.

The GD-70D can be used as a stand-alone device, offering a number of communication protocols to existing PLC systems, or can be integrated with RKI’s Beacon series of single and multi-channel controllers.

All GD-70D transmitters include a large, easy to read integral LCD display, tri-color bar graph for visual notification of alarm status, programmable low and high alarm relays, and fault relay. Pump flow is self-tuning for maintenance-free operation. Because all GD-70D base units are identical, sensors can be interchanged with no programming or tools required, resulting in maximum flexibility to the user. NEMA 4X 115 VAC versions available.

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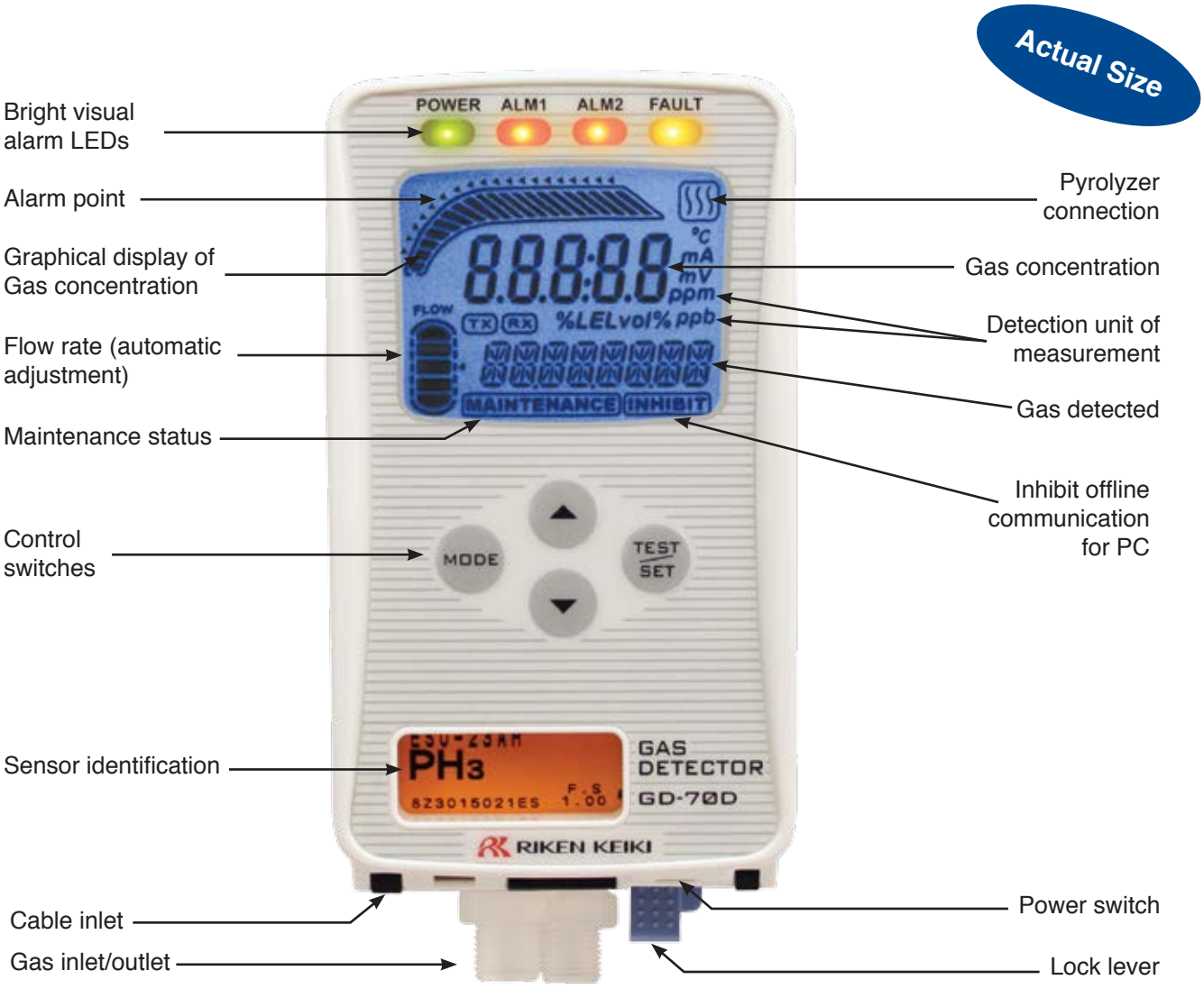
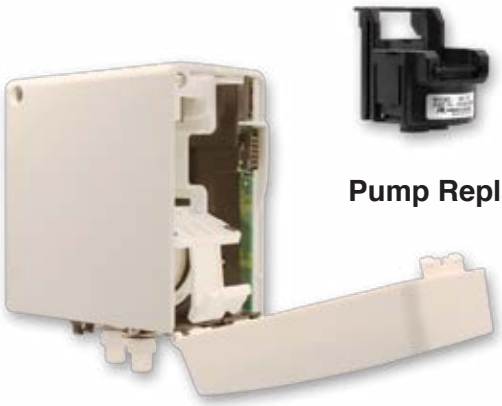
GD-70D Series



Tool Free Maintenance

Sensor Replacement



Pump Replacement

Specifications subject to change without notice.

MAIN UNIT			
Model	**GD-70D**	**GD-70D-NT**	**GD-70D-ET**
Communication	4-20mA DC	DC power line communication	PoE method
Detection principle	Different type depending upon sensor unit and detectable gas (see table)		
Sampling method	Sample draw (auto-adjustment of flow rate) 0.5 L / min +/-10%		
Display	• Large LCD display (white backlight) • Flow rate, communication status, pyrolyzer status, gas detected		• Gas concentration • Error code, content of error
Gas alarms	Two alarm levels: 1st alarm - Red	2nd alarm - Red	Fault alarm - Yellow
External output	1st, 2nd, and trouble alarms: Relay contact output for each alarm		
Self diagnostic function	System failure, sensor failure, flow failure, communication error NT / ET / Analog		
Datalogging	Event history, alarm history, calibration history. Alarm trend (180 sec before / after 1st alarm)		
Operation temp. & humidity	0 ~ 40ºC, 30 ~ 70% RH (non-condensing)		
Operating settings	All operational settings are user adjustable through front panel		
Power requirements	DC 24V+/- 10%, approx 1.5W (Max 4W including sensor unit) Note: Approx. 2.5W (Max 5W) with SGU sensor unit		PoE standard arrangement
Dimensions	2.8"W x 4.7"H x 5.9"D (70W x 120H x 150Dmm)		
Weight	Approx. 0.9kg (2.0lbs), including sensor unit		
Mounting	Wall-mounting base plate by 2 or 3 screws		
Sampling tubing	4 x 6mm PTFE tubing recommended. Tube fittings provided as standard accessories		
Bushing	Cable type varies depending on communication method (Cable bushing optional)		

SENSOR UNIT					
Model	**ESU**	**SGU**	**SSU**	**OSU**	**NCU**
Detection principle	Electrochemical cell	Semiconductor	Pyrolysis-particle	Galvanic cell	Catalytic combustion
Gas detected and detection range	Refer to list of detectable gases	0-2000ppm H_2, CH_4, or CH_2F_2 (R-32) in air and others	0-15ppm TEOS in air	0-25% O_2 in air	0-100% LEL H_2, CH_4, and others
Self diagnosis function	Sensor trouble, system failure				
Date logging function	Event history, alarm history, calibration history, Alarm trend (60 sec. before/after 1st alarm)				

PYROLYZER UNIT	
Model	PLU-70
Application	NF_3 / TEOS gases detected in air
Usage	Used by connecting to "GD-70D" (Main unit)
Power Lamp	LED (Green color) Normal: Light-on Warming-up: Flashing at every 1 sec interval Trouble: Flashing at every 0.2 sec interval
Self-diagnostic function	Pyrolyzer unit trouble Fan trouble System trouble
Operating temp. & humidity	0-40° C, 30-70% RH (non-condensing)
Operational settings	All operational settings are user adjustable through front panel
Power requirements	DC 24V+/- 10%, approx. 25W (max)
Dimensions	2.8"W x 4.7"H x 5.9"D (70W x 120H x 150Dmm)
Weight	Approx. 1.2kg (2.6lbs)
Mounting	Wall-mounting base plate by 2 or 3 screws
Sampling	4x6mm PTFE tubing recommended. Tube fittings provided as standard accessories
Bushing	1.25sq 2 core cable for power supply DC24V (Cable bushing optional)

GD-70D Series

ESU Gas Detected		Detection Range	ACGIH TLV-TWA	Part #
Ammonia	NH3	75 ppm	25 ppm	GD-70D-NH3
Arsine	AsH3	0.2 ppm	5 ppb	GD-70D-ASH3
Boron Trichloride	BCl3	15 ppm		GD-70D-BCl3
Boron Trifluoride	BF3	9 ppm	0.1 ppm	GD-70D-BF3
Bromine	BR2	1 ppm	0.1 ppm	GD-70D-BR2
Carbon Monoxide	CO	75 ppm ∗ 150 ppm 300 ppm ∗	25 ppm	GD-70D-CO- 01/02/03/11/12/13
Chlorine	Cl2	3 ppm 1.5 ppm ∗	0.5 ppm	GD-70D-Cl2
Chlorine Trifluoride	ClF3	0.6 ppm	(C) 0.1 ppm	GD-70D-ClF3-A
Diborane	B2H6	0.3 ppm	0.1 ppm	GD-70D-B2H6
Dichlorosilane	DCS	15 ppm		GD-70D-DCS
Disilane	Si2H6	15 ppm	(C) 2 ppm	GD-70D-Si2H6
Dimethylamine	(CH3)2NH	15 ppm	5 ppm	GD-70D-DMA
Diethylamine	(CH3CH2)2NH	15 ppm	5 ppm	GD-70D-DEA
Fluorine	F2	3 ppm	1 ppm	GD-70D-F2
Germane	GeH4	0.8 ppm	(C) 2 ppm	GD-70D-GeH4
Hydrogen Bromide	HBr	6 ppm, 9 ppm ∗	(C) 2 ppm	GD-70D-HBR-06/-09
Hydrogen Chloride	HCl	6 ppm, 15 ppm ∗	(C) 2 ppm	GD-70D-HCL- 06E/15E
Hydrogen Cyanide	HCN	15 ppm		GD-70D-HCN
Hydrogen Fluoride	HF	9 ppm, 3 ppm ∗	0.5 ppm	GD-70D-HF-03/-09
Hydrogen Selenide	H2Se	0.2 ppm	0.05 ppm	GD-70D-H2Se
Hydrogen Sulfide	H2S	1 ppm 30 ppm	1 ppm	GD-70D-H2S-01/-30
Methylamine	CH3NH2	15 ppm	5 ppm	
Nitric Oxide	NO	100 ppm	25 ppm	GD-70D-NO
Nitrogen Dioxide	NO2	9 ppm 15 ppm	3 ppm	GD-70D-NO2-09
Nitrogen Tetraoxide	N2O4	15 ppm		GD-70D-N2O4
Nitrogen Trifluoride	NF3	30 ppm	10 ppm	
Ozone	O3	0.6 ppm	0.1 ppm	GD-70D-O3
Phosphine	PH3	1 ppm	0.3 ppm	GD-70D-PH3-AH
Silane	SiH4	15 ppm	5 ppm	GD-70D-SiH4 -AH/DH
Silcon Tetrachloride	SlCl4	15 ppm		GD-70D-/SiCl4
Silcon Tetrafluoride	SiF4	9 ppm		GD-70D-SiF4
Sulfur Dioxide	SO2	6 ppm	—	GD-70D-SO2
Sulfur Tetrafluoride	SF4	9 ppm		GD-70D-SF4
Tetraethyl Orthosilicate	TEOS	15 ppm		GD-70D-TEOS
trichlorosilane	TCS	15 ppm		GD-70D-TCS
Trimethylamine	(CH3)3N	15 ppm	5 ppm	GD-70D-TMA
Tungsten Hexafluoride	WF6	9 ppm		GD-70D-WF6

SGU Gas Detected		Detection Range	ACGIH TLV-TWA	Part #
Carbonyl Sulfide	COS	2,000 ppm	—	
Dichloroethene	C2H2CL2	600 ppm	200 ppm	
Dichlorethylene	DCE	600 ppm		GD-70D-MDCE
Dichloromethane	CH2CL2	2,000 ppm	50 ppm	GD-70D-MDCM
Difluoromethane	R-32	2,000 ppm	1,000 ppm	
Fluoro Methane	R-41	2,000 ppm	1,000 ppm	
Hydrogen	H2	500 ppm ∗ 1,000 ppm ∗ 2,000 ppm 2% Vol.	—	GD-70D-MH2-S500 GD-70D-MH2-S1K GD-70D-MH2-S2K GD-70D-MH2-20K
Isopropyl Alcohol	CH3CHOHCH3	2,000 ppm	200 ppm	GD-70D-MIPA-2K
Methane	CH4	2,000 ppm 5,000 ppm ∗	—	GD-70D-MCH4-2K GD-70D-MCH4-5K GD-70D-MCH4-20K GD-70D-MCH3OH-1 GD-70D-MCH3OH-2
Methyl Alcohol	CH3OH	1,000 ppm 2,000 ppm ∗	200 ppm	
Propane	CH3H8	2,000 ppm 5,000 ppm ∗	1,000 ppm	GD-70D-MC3H8-2K GD-70D-MC3H8-2K
NCU Gas Detected		**Detection Range**	**LEL % Vol. Levels**	
Hydrogen	H2	100% LEL	—	GD-70D-LEL-H2
Hydrogen	H2	2% Vol.	—	GD-70D-H2-20K
Isobutane	i-C4H10	100% LEL	—	GD-70D-ISOB
Methane	CH4	100% LEL	—	GD-70D-LEL-CH4
Methane	CH4	2% Vol.	—	GD-70D-CH4-20K
SSU Gas Detected		**Detection Range**	**ACGIH TLV-TWA**	
Trimethyl Silane	TMS	15 ppm	—	GD-70D-TMS
Trimethoxysilane	TRIMOS	15 ppm	—	GD-70D-TRIMOS
Tetraethyl Orthosilicate	TEOS	15 ppm	10 ppm	
OSU Gas Detected		**Detection Range**	**ACGIH TLV-TWA**	
Oxygen	O2	25% Vol.	—	GD-70D-OXY

∗ Special order for non-standard range

RKI INSTRUMENTS

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INSTRUMENTS
Gas Detection For Life

Quick Reference Guide
Operation of the GD-70D
Rev. 5-17-11

Perform all zeroing and calibrations on the GD-70D in a known fresh air area.

Note: The GD-70D gas transmitter is a generic transmitter that can take a variety of different sensor units including electrochemical sensors (ESU), Pyrolysis-particle type (SSU), Semiconductor type (SGU) and Galvanic cell type (OSU). Consult the GD-70D manual for additional information.

1. **Installing the sensor**
   a. Remove sensor from packaging leaving sensor unit intact. (do not open up the sensor unit)
   b. Push the two release tabs on the top of the main unit to open the front cover.
   c. Attach sensor to main unit by pushing it in locking the sensor in place.
   d. Once sensor is secured, close the front cover pressing firmly until the cover clicks into place.
2. **Turning ON / OFF the GD-70D**
   a. Turn the GD-70D upside down so inlet and outlet fittings are facing up (if possible). If not, then you will need to look at the bottom of the GD-70D.
   b. Swing the white access door to the left to gain access to the POWER switch.
   c. "O" is OFF, "I" is ON.
   d. Move the POWER switch to the desired position.
   e. Swing the white access door back covering the POWER switch.
   f. Allow the GD-70D to warm up sufficiently before use.
3. **Changing Sensor Type**
   a. The GD-70D will automatically recognize the sensor unit when the sensor is replaced or the specifications have changed. When a sensor with a different serial number or with a different principle or specification is attached, the GD-70D will display one of the following messages:
      i. C-01 CHG UNIT: This message indicates that the sensor unit has been replaced with the same type (principle/type/range etc.). Press and hold the MODE button to acknowledge the new sensor and start up the unit.
      ii. C-02 CHG SPEC: This message is displayed if a sensor unit with a different specification (principle/type/range etc.) is attached. Press and hold the MODE button to acknowledge the new sensor unit

with new specifications and to start up the unit. Instrument will boot up and indicate 1-1 ZERO Press the SET button, then press the SET button again to ZERO the sensor. The GD-70D will indicate ZERO OK and revert back to menu 1-1. Press and hold the MODE button to return to normal operation.

iii. Note: Bump test or calibrate sensor unit after replacement is recommended to confirm operation.

4. User Mode

a. Press the MODE key for three seconds
b. Menu 1-1 ZERO will be displayed
   i. Press the SET key to enter this function
   ii. The current zero value will be displayed (ZERO SET)
   iii. Pres the SET key to perform the zero adjustment
   iv. The display will indicate zero reading and indicate ZERO OK if adjustment can be made. If not, ZERO NG will be displayed.
   v. The GD-70D will then return to menu 1-1 ZERO automatically
   vi. Press the UP key to move to the next menu
c. Menu 1-2 CONFIRM will be displayed
   i. Press the SET key to enter this function
   ii. First alarm point will be displayed. Example: 5.0 ppm AL 1
   iii. Use the UP arrow to scroll to the second alarm point. Example 10.0 ppm AL 2
   iv. Press the UP arrow to view Alarm Delay in seconds
   v. Press the UP arrow to view Zero Suppression Value. Example: 0.9 ppm SUPPRESS
   vi. Press the UP arrow to view Zero Follower ON/OFF display (if ESU or SSU sensors are installed). Example: ON ZERO F
   vii. Press the UP arrow to view Sensitivity Correction ON/OFF display (if ESU sensor installed). Example: OFF S ASSIST.
   viii. Using the UP or DOWN arrows will scroll through the 1-2 menus.
   ix. Press the MODE key to return to menu 1-2.
   x. Press the UP key to move to the next menu
d. Menu 1-3 FLOW
   i. Press the SET key to view flow rate in liters/min. Example: 0.50 L/M
   ii. Press the MODE key to move back to menu 1-3 FLOW.
   iii. Press the UP key to move to the next menu.
e. Menu 1-4 ADDRESS
   i. Press the SET key to view detector's network address. Example: 01 ADDRESS
   ii. Press the UP key to move to the next menu
   iii. Note: Must be set up for digital communications.
f. Menu 1-5 70D VER
   i. Press the SET key to view program version of the main unit. Example: 03647 4E74
   ii. Press the MODE key to return to menu 1-5
   iii. Press the UP key to move to the next menu
g. Menu 1-6 UNIT VER

i. Press the SET key to view the program version of the installed sensor unit.
ii. Press the MODE key to return to menu 1-6
iii. Press the UP key to move to the next menu

h. Menu 1-7 NET VER
i. Press the SET key to view the program version of the communication function (NT specification)
ii. Must be set up for digital communications.
iii. Press the UP key to move to the next menu

i. Menu 1-8 M MODE
i. Press the SET key once;
ii. Then press and hold the SET key for three seconds to enter into MAINTENANCE MODE.
iii. Pressing the UP key will bring you back to Menu 1-1 ZERO; or press and hold the MODE key to return to normal operation. If you fail to press the MODE key to return the monitor to normal operation, the unit will automatically return to normal mode in 10 hours.

5. Maintenance Mode

a. Gas introduction display. When you enter Maintenance Mode, the first menu item is 2.0 GAS TEST.
i. If SET key is pressed display will flash GAS TEST alternating with GAS type.
ii. Press the MODE button to return to menu 2-0.
iii. Press the UP key to move the next menu.

b. Menu 2-1 ZERO
i. Press the SET key to enter ZERO adjustment mode.
ii. Press the SET key again to zero the detector. When completed ZERO OK will be displayed briefly then display will return to menu 2-1.
iii. Press the UP key to move to the next menu.

c. Menu 2-2 SPAN
i. Press the SET key to enter this mode
ii. Connect calibration gas to transmitter and allow reading to stabilize or a maximum of 2 minutes.
iii. Press the SET key
iv. The display will indicate actual gas reading and SPAN VAL
v. Use the UP or DOWN keys to set reading to gas value as indicated on the cylinder.
vi. Press the SET key to adjust. If adjustment is successful, the display will indicate SPAN OK, then SAVE Y/N?
vii. Press the SET key to record the adjustment result.
viii. Display will then indicate SPAN END.
ix. Display will return to 2-2 SPAN. Remove the test gas from the inlet tube.
x. If the span adjustment fails, the display will indicate SPAN NG. Check span gas concentration and/or replace sensor if needed.
xi. Press the UP key to move to the next menu.

d. Menu 2-3 LAST CAL
    i. Press the SET key will show the date and time of the last calibration.
    ii. Press the MODE key to return to menu 2-3.
    iii. Press the UP key to move to the next menu.
e. Menu 2-4 BIAS
    i. Press the SET key to display the bias voltage. Example: 250 mV
    ii. Press the MODE key to return to menu 2-4.
    iii. Press the UP key to move to the next menu.
f. Menu 2-5 DEF FLOW
    i. This is normally not used unless the flow sensor has been replaced.
    ii. Press the UP key to move to the next menu.
g. Menu 2-6 FLOW
    i. Press the SET key to display flow rate in LPM. Example: 34% 0.50 L/M.
    ii. Press the MODE key to return to menu 2-6.
    iii. Press the UP key to move to the next menu.
h. Menu 2-7 TEMP
    i. Press the SET key to display the temperature of the detector in degrees C. Example: 25.4 Deg. C.
    ii. Press the UP key to move to the next menu.
i. Menu 2-8 WARM TIME
    i. Press the SET key to display the warmup completion date/time for semiconductor type sensors. (Must have MOS sensor in unit to work)
    ii. Press the UP key to move to the next menu
j. Menu 2-9 SETTING1
    i. Press the SET button.
    ii. The display will indicate SET 0 INHIBIT.
    iii. OFF INHIBIT will be displayed. Press the UP or DOWN button to toggle ON INHIBIT or OFF INHIBIT.
        1. This function enables or disables the alarm function when the detector is in normal operation.
    iv. Press the SET key to return to SET 0 INHIBIT.
    v. Press the UP key to move to the next menu.
    vi. SET 1.ALM P
        1. Press the SET key enter this menu.
        2. Press the UP or DOWN key to set the alarm point for the first alarm. Example: 25.0 ppm AL 1
        3. Press the SET button to move to alarm two.
        4. Use the UP or DOWN keys to set the alarm two set point. Example: 50 ppm AL 2.
        5. Press the SET key to return to SET 1.ALM P menu.
        6. Press the UP key to move to the next menu.
    vii. SET 2 ALM DLY
        1. Press the SET key to see the alarm delay. Example: 2 (SEC).

2. Use the UP or DOWN key to adjust the alarm delay.
3. Press the SET button to return to SET 2 ALM DLY.
4. Press the UP button to move to the next menu.

viii. SET 3 MAINTE
1. Press the SET button to enter this mode.
2. This is used to stop the pump when transmitter is in operation in order to replace pump assembly.
3. Press the SET key again to return to SET 3 MAINT menu.
4. Press the UP key to move to the next menu.

ix. SET 4 F TEST (Fault alarm test)
1. Press the SET button to enter this mode. SET 4 F TEST will be displayed.
2. Press the UP or DOWN keys to select OFF F TEST or ON F TEST.
3. Press SET key to activate fault alarm.
4. Press the UP key to select OFF F TEST then press the SET key to disable the fault test.
5. Press the SET key again to deactivate the fault alarm
6. Press the MODE key to cancel this menu and return to SET 4 F TEST.
7. Press the MODE key to return to menu 2-9 SETTING.
8. Press the UP key to move to the next menu.

k. 2-10 SETTING2
i. Press the SET key to enter this mode. The display will indicate SET 0 ADDRESS.
ii. Press the SET key enter. (Note: Needs to be set up for digital communications)
iii. Press the UP key to move to the next menu.
iv. SET 1 DAY TIME
1. Press the SET key to enter this mode. Display will indicate the following: TIME, YEAR, MONTH, DAY.
2. Press the SET key to select the YEAR. Use the UP or DOWN keys to set the correct YEAR. Press the SET key to move to month.
3. Use the UP or DOWN keys to select the correct MONTH. Press the SET key to move to DAY.
4. Use the UP or DOWN keys to select the correct DAY. Press the SET key to move to HOURS.
5. Use the UP or DOWN keys to set the proper HOURS. Press the SET key to move to MINUTES.
6. USE the UP or DOWN keys to set the proper MINUTES then press the SET key. The display will revert to menu SET 1 DAY TIME.
7. Press the UP key to move to the next menu.

v. SET 2 SUPPRESS
1. Press the SET key to enter this mode.
2. The display will indicate current zero suppression. Example: 4.5 ppm.

3. Use the UP or DOWN keys to set the zero suppression desired.
4. Press the SET button when completed.
5. Display will revert to SET 2 SUPPRESS.
6. Press the UP key to move to the next menu item.

vi. SET 3 SUP TYPE
1. Press the SET key to enter.
2. You can select CUT or SLOPE. If CUT is selected, values that exceed the suppression are directly displayed. When SLOPE is selected, values that exceed suppression are slowly displayed.
3. Once either CUT or SLOPE is selected press the SET key to return to menu SET 3 SUP TYPE.
4. Press the UP key to move to the next menu.

vii. SET 4 TEST RELY
1. Press the SET key to enter this mode.
2. This mode allows you to set the contact activation for an alarm test. Select either ON or OFF and then press the SET key to confirm the selection. When ON is selected the contact can be activated even during an alarm test.
3. Display will indicate OFF TEST RLY.
4. Push the UP button to select ON TEST RLY then press the SET key to return you to menu SET 4 TEST RLY.
5. Press the UP key to move to the next menu.

viii. SET 5 TEST 4-20
1. Press the SET key to enter this mode.
2. This mode sets the external output for an alarm test. Select either ON or OFF and then press the SET key to confirm. When ON is selected, the external output is active even during an alarm test. Default setting is ON.
3. Press the set key to return to menu SET 5 4-20.
4. Press the UP key to move to the next menu.

ix. SET 6 RELY PTRN
1. Press the SET key to enter this mode.
2. The display will indicate nd AL 1 RLY (Energized Relays)
3. Pressing the UP button will select nE or (Non-energized Relays) Default is nd.
4. Pressing the SET key will move to AL2 RLY
5. Pressing the SET key will move to FLT RLY
6. Use the UP or DOWN keys to set the alarm logic required.
7. Press the SET key will return you to menu SET 6 ALY PTRN.
8. Press the UP button to move to the next menu item.

x. SET 7 ALM TYPE
1. Press the SET key to enter this menu.
2. Note: This can only be used with an OSU galvanic O2 sensor.

3. You can select L-LL (two falling alarms), LH (one falling and one rising alarm) or H-HH (two rising alarms) as needed for oxygen.
4. Press the UP key to move you to the next menu item.

xi. SET 9 AL LIMIT
1. Press the SET key to enter this menu.
2. The display will indicate on AL LIMIT.
3. Pressing the UP or DOWN keys can toggle this feature either on or off.
4. Press the SET key to return to menu SET 9 AL LIMIT.
5. Press the UP key to move to the next menu.

xii. SET 10 FLT PTRN
1. Press the SET key to enter this menu.
2. The display will indicate nL FLT PTRN (default setting).
3. Pressing the UP or DOWN key will toggle between nL (non latching) and L (latching).
4. Press the SET key to return to menu SET 10 FLT PTRN.
5. Press the UP key to move to the next menu item.

xiii. SET 11 AT FLOW
1. Press the SET key to enter this mode.
2. Pressing the UP or DOWN keys will toggle between on and oFF. On is the default setting.
3. Press the SET key to return you to menu SET 11 AT FLOW.
4. Press the UP key to move to the next menu item.

xiv. SET 12 ZERO F
1. Press the SET key to enter this mode.
2. The display will indicate on ZERO F.
3. This allows you to have the zero follower circuit either ON or OFF. On is the default setting.
4. Press the SET key to return to menu SET 12 ZERO F
5. Press the UP key to move to the next menu item.

xv. SET 13 ZERO 24F
1. Press the SET key to enter this mode.
2. This mode is used for the above zero follower. A setting to determine whether the first 24 hour zero follower will be performed after power is turned on. On is the default setting.
3. Press the SET key to return to menu SET 13 ZERO 24F.
4. Press the UP key to move to the next menu item.

xvi. SET 15 MNT OUT
1. Press the SET key to enter this menu.
2. Using the UP key will allow you to select the following: This sets the external output for the maintenance mode. You can select: 2.5mA, 4.0 mA, HOLD or 4-20mA. Default is 2.5mA.
3. Press the SET key to return to menu SET 15 MNT OUT.
4. Press the UP key to move to the next menu item.

xvii. SET 16 MA 4-20
1. Press the SET key to enter this menu.

2. This menu allows you to tune the 4-20 mA. This must be done using an ammeter.
3. Press the SET key to return to menu SET 16 MA 4-20.
4. Press the UP key to move to the next menu item.

xviii. SET 17 BK LIGHT
1. Press the set key to enter this menu.
2. Using the UP or DOWN keys, you can toggle between ON and SAVE. When ON the backlight is on continuously. If SAVE the backlight only lights up during an operation or an event. Default is ON.
3. Press the SET key to return to menu SET 17 BK LIGHT.
4. Press the UP key to move to the next menu item.

xix. SET 18 ETHERNET
1. Press the UP key to move to the next menu item.

xx. SET 19 PUMP CK
1. Press the UP key to enter this menu.
2. On PUMP CK will be displayed.
3. Using the UP or DOWN buttons toggles between ON or OFF. The default is ON.
4. Press the SET key to return to menu SET 19 PUMP CK.
5. Press the MODE key to return to menu 2-10 SETTINGS.
6. Press the UP key to move to the next menu item.

l. 2-11 PL DATA
i. No adjustment.
ii. Press the UP key to move to the next menu.

m. 2-12 FAULT
i. No adjustment.
ii. Press the UP key to move to the next menu.

n. 2-13 F MODE
i. This is the FACTORY MODE, password is required to enter this mode. No customer adjustments.
ii. Push and hold the MODE key to return to normal operation.

GD-70D series

Solar Cell, Semiconductor & LCD Factories

Improved Function

Environmentally Friendly Design

Global Standard

Concept

GD-70D has been developed to fulfill all the customer's wants and needs

Improved Function

Universal design

1) Basic components consists of:
   * Main PCB, Sensor assembly and Pump unit
2) Easy maintenance from front access. No tools required.
3) Large LCD (White-color backlight)
4) No need for daily check. Auto flow adjustment and self diagnosis.

Environmentally Friendly Design

Compact and Renewable

5) Power-saving technology
6) Simple Operation
7) Smaller size and weight
8) Recyclable sensor/amplifier module

Global standard

International Certificate

9) RoHS/CE marking

Features for GD-70D

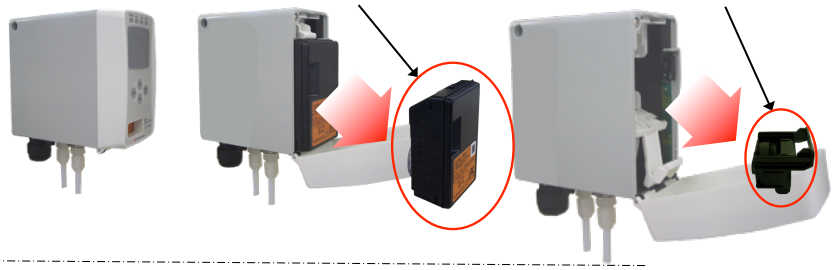
1. **Common platform for all detection methods**
2. **Universal Main unit for all sensor types**
3. **Multifunctional intelligent Sensor unit**
4. **No internal tubing (Main unit) / No Coil (Pump unit)**
5. **Front access, no tools required for easy replacement of sensor & pump**
6. **Large size LCD (Easily viewable)**
7. **Various communication method available (4-20mA, NT and POE)**
8. **Reduced maintenance through enhanced firmware functions**
9. **Small Footprint**
10. **Simple upgrade from existing units**
11. **Environmentally Friendly**
12. **Global standard certificate**

Upgraded Function

1. Common platform for all detection methods

GD-70D consists of three independent modules: main unit, sensor unit and pump unit.

a) Main unit **b) Sensor unit** **c) Pump Unit**



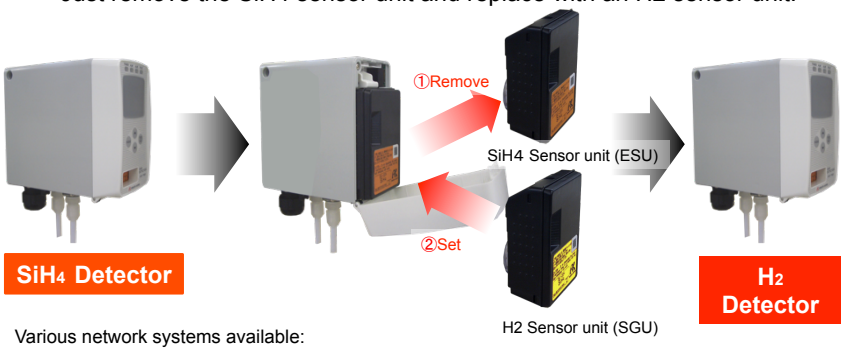
Pyrolyzer (PLU-70D)
Connecting pyrolyzer (PLU-70D) to GD-70D, TEOS & NF3 can be measured.
Temperature for PLU-70D is automatically controlled.

Setting Signal converter the (SD-70SC) & GD-70D can be Networked.

Upgraded Function

2. Universal Main unit

Main unit can be used with all sensor units with various detection principles
Converting from SiH4 to H2 is simple!
Just remove the SiH4 sensor unit and replace with an H2 sensor unit.



Various network systems available:
GD-70D : 4-20 mA DC
GD-70D-NT : NT
GD-70D-ET : PoE

The GD-70D has functions that will not allow the insertion of incorrect sensor units. Every sensor unit has a unique identification which prevents installation error.

Upgraded Function

3. Multifunctional Intelligent Sensor Unit

Each sensor has onboard CPU and provides multiple functions

- **There are five different detection technologies available.**
- **Each sensor unit can monitor and control measuring status.**
- **In the event of an alarm, its measuring status can be memorized by the sensor.**

Available Sensor Units


Electro Chemical


Semiconductor


Galvanic Cell

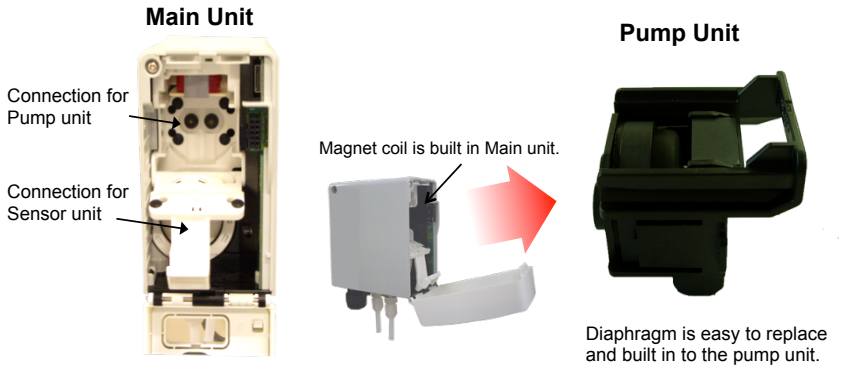

New Ceramic


Pyrolysis-Particle

Upgraded Function

4. No internal tubing and no pump coil to replace

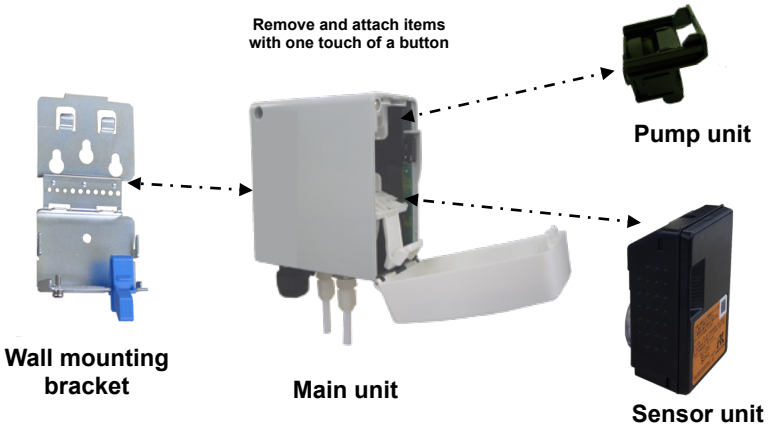
The diaphragm is built in Pump unit for GD-70D
The magnetic coil is built in to the Main Unit.
There are no tubes inside Main Unit to simplify maintenance



Upgraded Function

5. Front access for easy maintenance

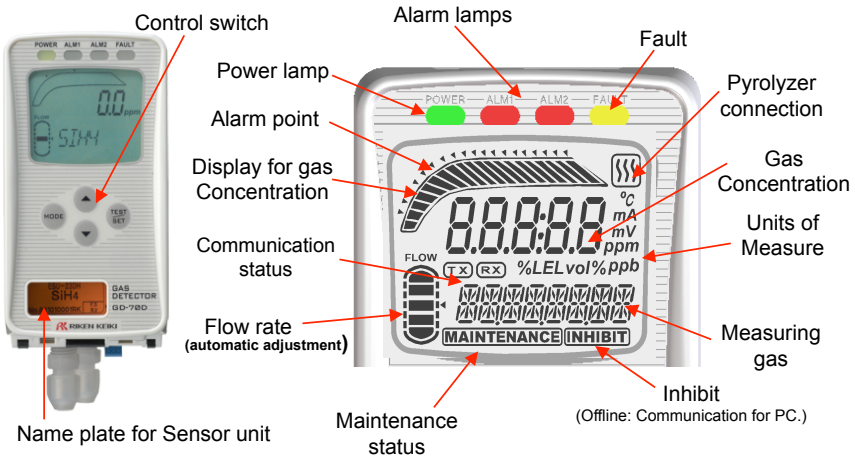
Sensor Unit/Pump unit can be removed easily with one touch of button.



Upgraded Function

6. Large size LCD

GD-70D has a large easy-to-read LCD that displays all information such as measuring gas, gas concentration, flow level and connecting devices.
Dual display for gas concentration : Analog bar graph and digital readouts

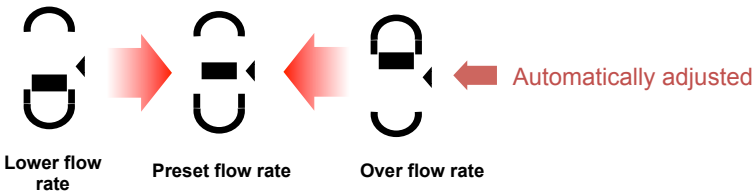


Upgraded Function

7. Reduced maintenance through enhanced troubleshooting firmware functions

- Automatic flow rate control

GD-70D can automatically control flow rate to preset flow level, which makes gas measuring stabilized.



- Self-diagnosis function

GD-70D continuously monitors various measuring status in detail.

- Data logging functions

Event history, Alarm history, Calibration history, Alarm trend with 1 sec interval

Global Standard

11. Global standard

CE marking

RoHS

IEC Standard

Specifications

Main Unit

Model	GD-70D	GD-70D-NT	GD-70D-ET
Communication	4-20mADC	DC power line communication	POE Method
Detection principle	Different type depending upon sensor unit and detectable gas (See table on back page for list of sensor types and detectable gases)		
Sampling method	Sample-drawing (Auto-Adjustment of flow rate)		
Display	Large LCD (White back light) ▪Gas Concentration ▪Flow rate / Communication status / Pyrolizer status / Character display ▪Measuring gas / Error code / Content of error / Character message display		
Display	1ST alarm: red / 2nd alarm: red / Fault alarm:yellow		
External Output	1st alarm / 2nd alarm / Trouble alarm :Relay contact output for each alarm		
Self diagnosis	▪System failure ▪Sensor failure ▪Flow failure ▪Communication failure(NT / ET)		
Date logging function	▪Event history / Alarm history ▪Calibration history ▪Alarm trend (180 sec Before / after 1st alarm)		
Operating conditions	0-40℃ (Without rapid change) ▪30-70%RH (non-condensing)		
Operational Setting	All operational setting are user adjustable by using the front panel		
Power requirement	DC 24V±10% Approx. 5W (Including Sensor unit)		POE standard arrangement
Dimensions	70(W) × 120(H) × 150(D)		
Weight	Approx. 0.9Kg (2.0 lbs) Including sensor unit		
Mounting	Wall-mounting base plate by 3 screws		
Sample Tubing	4 x 6 mm PTFE tubing recommended. Ppfalf union fittings provided as standard accessories.		
Cable	Cable type varies depending on communication method (Cable gland optional)		

Specifications

Sensor Unit

Model	ESU	SGU	SSU	OSU	NCU
Detection Principle	Electrochemical Cell	Semiconductor	Pyrolysis-Particle	Galvanic Cell	New Ceramic
Identification Marking					
Self-diagnosis Function	▪Sensor trouble ▪System failure				
Date-logger Function	▪Event history / Alarm history ▪Calibration history ▪Alarm trend（60 sec Before / After 1st alarm）				

Specifications

Pyrolyzer Unit

Model	PLU-70
Application	Measuring NF3 / TEOS gases
Usage	Used by connecting to “GD-70D”(Main unit)
Display	▪LED (Green color) - Normal：light-on / Warming-up ：flashing 1sec interval / Trouble： flashing 0.2 sec interval
Self-Diagnosis Function	▪Pyrolyzer unit trouble ▪Fan trouble ▪System trouble
Operational Temp. & Humidity	▪0-40℃（Without rapid change） ▪30-70% RH（non-condensing）
Operational Settings	Operational setting are user adjustable by using the front panel (Main unit).
Power Supply	DC 24V±10% Approx.36W (MAX)
Dimension	70(W) × 120(H) × 150(D) (2.8”W x 4.7”H x 5.9”D)
Weight	Approx. 1.2Kg (2.6 lbs)
Mount-Type	Wall-mounting base plate by 3 screws
Sampling Tubing	4 x 6 mm PTFE tubing recommended. PP half union fittings provided as standard accessories.
Cable	Cable type varies depending on communication method (Cable gland optional)

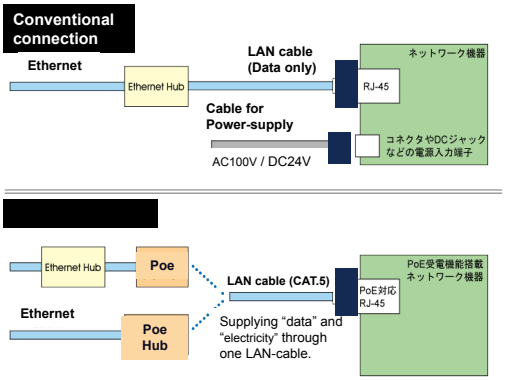
Power over Ethernet

PoE（Power over Ethernet）is a technology that can supply electricity to the detector through LAN cable,（IEEE802.3af）

With this PoE technology, data communication and electricity are available through one piece of LAN cable. Therefore, Detector (GD-70D) can be set without external power source, such as AC adaptor.
GD-70D requires less wiring and cost than units with additional power source（※CAT.5 LAN cable is necessary for PoE connection.

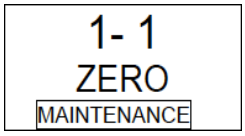
Gas detector(GD-70D) will become Ethernet terminal unit!

- **Cable cut-down**
  （Line for electricity not required）
- **Labor cost reduced**
  （Only RJ-45 connection required）
- **Material cost reduced**
  （Cable for construction reduced）

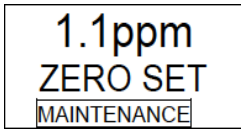


GD-70D Fresh Air

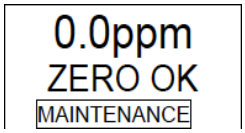
- Press and hold “mode” for 3 seconds.
- Press “SET”

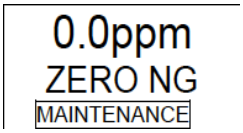


- Press “SET” to perform the zero adjustment



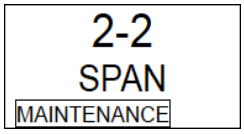
- The menu displays “ZERO OK” if pass, or “ZERO NG” for fail





GD-70D Calibration

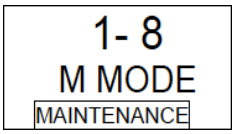
- Press and hold “mode” for 5 seconds.
- Press mode until 2-2.SPAN is displayed



- Press the Set to select SPAN

GD-70D Calibration

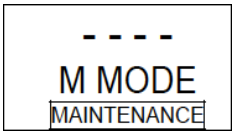
- Press and hold “mode” for 5 seconds.
- Press the down arrow to select 1-8.M MODE



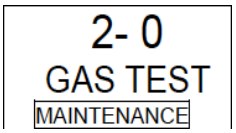
- Press the Set to select 1-8.M MODE

GD-70D Calibration

- Then press the SET key again for three seconds.

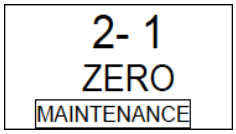


- 2.0 GAS TEST
  Perform a test with the gas. Similar to the detection mode, the reading changes and the alarm lamp lights up after the gas is introduced, but the contact is not activated.

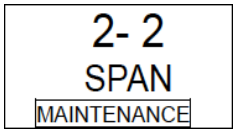


GD-70D Calibration

- 2-1. ZERO
  Perform the zero adjustment.



- 2.2 GAS TEST
  Perform a test with the gas. Similar to the detection mode, the reading changes and the alarm lamp lights up after the gas is introduced, but the contact is not activated.

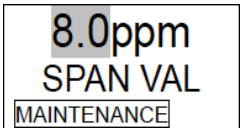


- Press Set to begin Span Adjustment

GD-70D Calibration

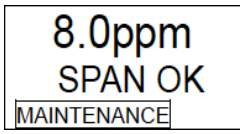
- Allow gas to flow, and then press the SET key when the reading is stabilized

- Make Span Adjustment
  Because the reading will be fixed, select the introduced gas concentration by pressing the ▲ or ▼ key. Select the number, and then press the SET key. (20.9 vol% in the oxygen deficiency alarm specification)

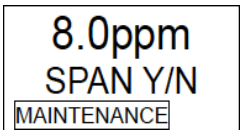


GD-70D Calibration

- Span adjustment completed



- To record the adjustment result, press the SET key. (Press the MODE key to cancel this menu.)



- The menu automatically returns to 2-2.SPAN

Replacing the GD-70D Flow Sensor

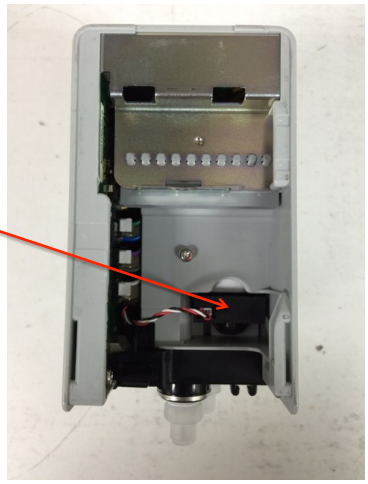
Replacing the Flow Sensor

- Turn off power and remove the GD 70D from the mounting bracket.

•2

Replacing the Flow Sensor

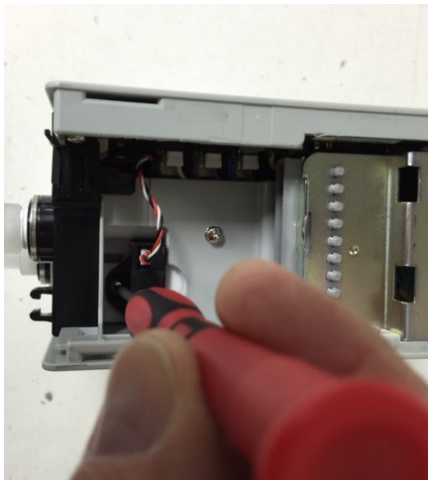
- Turn the GD-70D upside down to gain access of the flow sensor.
- Replacement flow sensor is: P/N 31-1011-01.



•3

Replacing the Flow Sensor

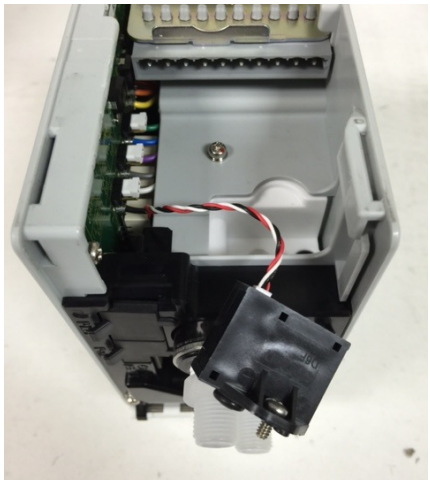
- Using a small Phillips screwdriver, remove the one screw that secures the flow sensor to the GD-70D.
- Lift up on the connecting cable to remove sensor.



•4

Replacing the Flow Sensor

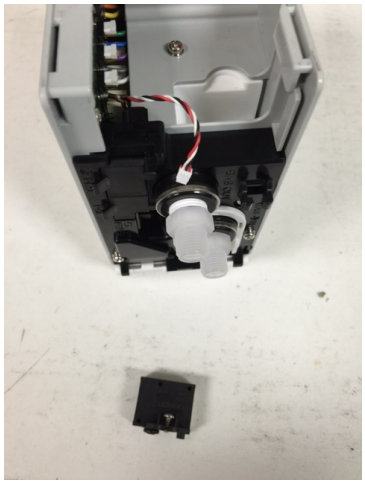
- Lift out flow sensor and remove electrical cable from flow sensor.
- Make sure that the old O-rings are removed from the chamber.



•5

Replacing the Flow Sensor

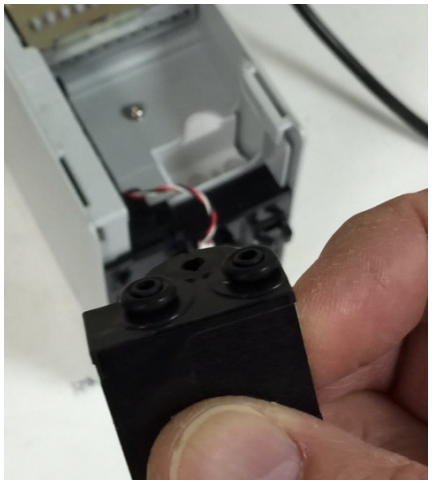
- Old flow sensor removed.



•6

Replacing the Flow Sensor

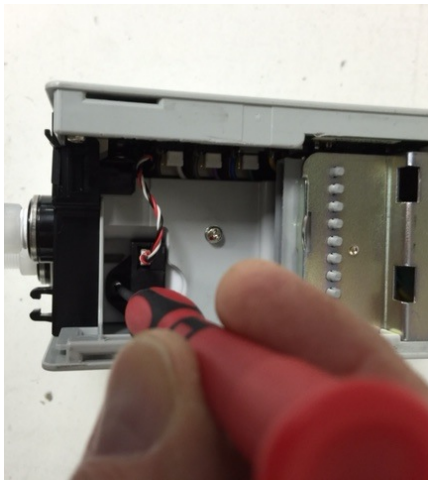
- Place new O-rings on the new flow sensor if not already installed.
- Attach electrical cable to flow sensor and place flow sensor back into GD-70D.



•7

Replacing the Flow Sensor

- Screw new flow sensor back into GD-70D.



•8

Replacing the Flow Sensor

- Reattach the GD-70D to the mounting plate.
- Turn on the GD-70D
- Press and hold the MODE button.
- First menu is 1-1, ZERO.
- Press the UP button to Menu 1-3 Flow

•9

Replacing the Flow Sensor

- With Menu 1-3 displayed, press the SET button to enter this mode.

•10

Replacing the Flow Sensor

- In Menu 1-3 you will see the flow rate in Liters per Minute.
- Press the Mode button to return to menu 1-3.

•11

Replacing the Flow Sensor

- If flow rate is not at .5 LPM, use UP button to scroll to menu 1-8.
- Push and release the SET button.

•12

Replacing the Flow Sensor

- You will see dashes.
- Press and HOLD the SET button to enter into Level 2 menu.

•13

Replacing the Flow Sensor

- Using the UP button, scroll to Menu 2-5 DEF FLOW and press the SET button.

•14

Replacing the Flow Sensor

- Push the SET button again to default flow.
- This will bring you back to Menu 2-5.
- Push and HOLD the MODE button to return to normal mode.

•15

Replacing the Flow Sensor

- With instrument back in normal operation verify that flow indicator shows normal flow rate.
- Calibrate the GD-70D when completed.

•16

INSTRUMENTS

Gas Detection For Life

Training Notes