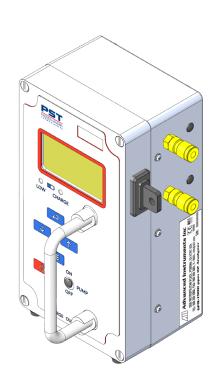
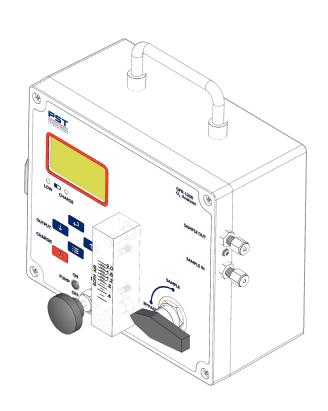
## Hazardous Location Analyzer Field Servicing Guide

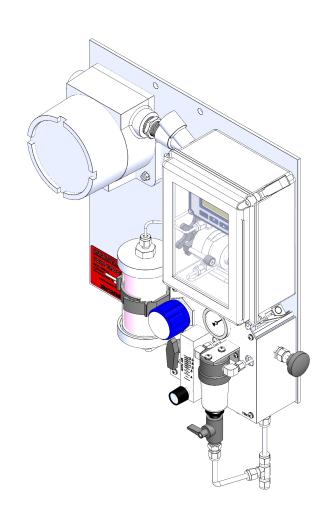
# PROCESS SENSING TECHNOLOGIES

## **Oxygen Analyzers**

PST-FSG-3015-00









Revision	Release Date	Description	CR Number	Author
0	07/2024	Document release	CR# 24-33	OP, IM (ed)



Hazardous Location Analyzer Field Servicing Guide

For contact information, visit ProcessSensing.com

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Welcome to the field servicing guide for our oxygen analyzers.

Here, you will find a list of serviceable parts for each of our analyzers as well as instructions for safe replacement. Please ensure that the parts that you are replacing match the serial numbers that were provided by PST. Please read the safety information below.

#### Start here



#### **Safety Information**

- Keep water and liquids away from electrical components and electricity sources to prevent electric shock, fires, and destruction of wire insulations.
- When installing electrical parts, avoid pulling wires during assembly.
- Do not service parts in an environment where explosive or flammable gases are present.
- Switch off and unplug the unit before performing field servicing procedures.



#### **Required PPE**

• Users must always wear an anti-static wrist strap whilst servicing parts.

Tools needed							
Philips screwdriver							
Flat screwdriver							
Scissors / cutter							



#### **Serviceable Parts**

This field servicing guide applies only to PST branded products with a serial number starting from: 306737869.

Before replacing any parts, ensure that the serial number and certification match the documents provided by PST. Part replacement instructions can only be carried out on the units listed below. These procedures do not require any soldering or use of any machines to provide easy replacement of parts on the field. For other parts not mentioned below, please contact PST to determine if unit can be shipped for repair and replacement.

Field Serviceable Parts List		Portable Analyzer				Online Analyzer	Loop Analyzer	
Field Serviceable Parts	Page #	GPR-1000	GPR-1100	GPR-1200	GPR-2000	GPR-x500/x800 (A)IS	GPR-1500	GPR-2500
A. Main PCB	5	✓	✓	✓	✓	✓	✓	✓
B. Power PCB	6	-	-	-	-	✓	-	-
C. Battery	7	✓	✓	✓	✓	-	-	-
D. Top Sensor Assembly	8	-	✓	✓	-	✓	✓	-
E. Sensor Cable	9	✓	-	-	✓	-	-	✓
F. Coalescing Filter Assembly	10	-	-	✓	✓	✓	✓	✓
G. LCD Display Assembly	11	-	-	-	-	✓	✓	✓
H. H2S Scrubber	12	-	-	✓	✓	✓	✓	✓
I. H2S Scrubber Media	13	-	-	✓	✓	✓	✓	✓
J. Sensor Seal	14	-	✓	✓	-	✓	✓	-
K. O2 Sensor	15	✓	✓	✓	✓	✓	✓	✓



## A. Replacing the Main PCB This section applies to the analyzers listed on page 4.





Part Number: A-1400

- 1. To remove the front enclosure, loosen the enclosure screws with a flat screwdriver or lift the latches.
- 2. Locate the main PCB, which is located behind the LCD. Unscrew the enclosure screws with a Philips screwdriver.
- 3. Remove the 4 short standoffs and unplug all the connectors from the main PCB.

#### NOTE: Do not pull by the wire as this could cause damage.

- 4. First remove the strain relief on the main PCB, then pull down the tabs on the connector to release and remove the ribbon cable.
- 5. Carefully lift the main PCB upwards and pull out both sides of the tab to detach the LCD ribbon cable.

NOTE: Do not shift the ribbon left and right as this could cause damage.

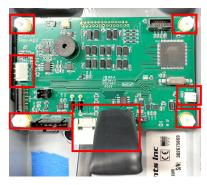


Figure 1: Hardware and connectors to remove from main PCB

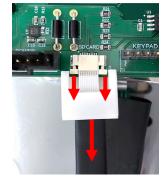


Figure 2: Removing SD card ribbon cable with the strain relief

- 6. Place the new main PCB then connect the LCD ribbon cable to the ribbon cable connector with the connector tabs outward.
- 7. Ensure the LCD ribbon cable is inserted all the way then secure it by pushing in the tabs.
- 8. To secure the main PCB, place it on the standoffs then secure it with the smaller standoffs.
- 9. Reconnect the SD card ribbon cable to the SD card connector, while it is still in the strain relief. Do the same with the LCD ribbon cable.
- 10. Plug all the connectors back into the main PCB.



Figure 3: Location and insertion of LCD ribbon cable

- 11. Re-fit the front enclosure and secure it by tightening the enclosure screws with a flat screwdriver or locking the latches.
- 12. Switch on the unit to verify the procedure is a success.

  If the unit does respond, re-open it and check the assembly.



## B. Replacing the Power PCB This section applies to the GPR-x500/x800 (A)IS analyzers.





Part Number: A-1401

- 1. To open the left enclosure, turn the cover counter-clockwise.
- 2. Locate the power PCB, then unplug the connectors from the power PCB and leave them loose.

#### NOTE: Do not pull by the wire as this could cause damage.

- 3. Use a Philips screwdriver to remove the 3 screws, then lift the base plate away to reveal the power PCB.
- 4. Unscrew the 3 standoffs to free the power PCB.
- 5. Carefully turn over the power PCB and unscrew the terminals to remove the power PCB wires.
- 6. Remove the old power PCB and place the new one in the enclosure.
- 7. Rewire the power PCB and tighten terminal screws to secure (see Figures 5 and 6 for guidance).

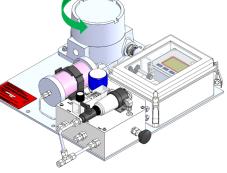


Figure 4: Location of enclosure

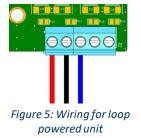


Figure 6: Wiring for AC/DC powered units

8. Reassemble by following steps 1-7 in reverse.

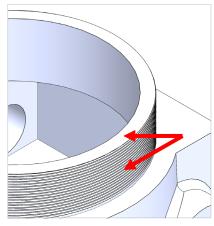


Figure 7: Inspect threading for signs of damage

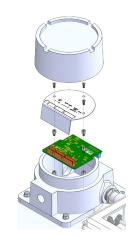


Figure 8: Enclosure assembly

- 9. Clean and inspect the enclosure for any signs of damage and debris.
- 10. Inspect the flame path/threading joint between the lid and body for damage to the threads.
- 11. Inspect gaskets for pitting, damage, or signs of corrosion.
- 12. Wipe dirt, grit, and other foreign bodies from the screw threads.



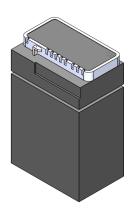
If there is damage to any components, the integrity of the Exd protection may be compromised.

In this event, contact PST immediately.

13. Close the left enclosure by turning the cover clockwise.



#### C. Replacing the Battery This section applies to the GPR-1000, GPR-1100, GPR-1200 and GPR-2000 portable analyzers.



Part Number: A-4770 A-4771

- 1. To remove the front enclosure, loosen the enclosure screws with a flat screwdriver, (see Figure 9).
- 2. Unplug the battery wires by pulling the connectors.

#### NOTE: Do not pull by the wire as this could cause damage.

- 3. Using scissors, cut the zip ties to free the wires.
- 4. Remove the screws, standoffs, bolts, washers, and battery clamps that may be in the way of the battery.

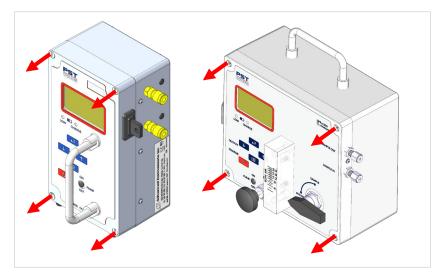


Figure 9: Loosen the enclosure screws

- 5. Remove the old battery and place the new one in the enclosure, ensuring the correct orientation as shown in Figure 10.
- 6. Attach the connectors from the battery to the analyzer.
- 7. Secure the wires with zip ties for a clean assembly.

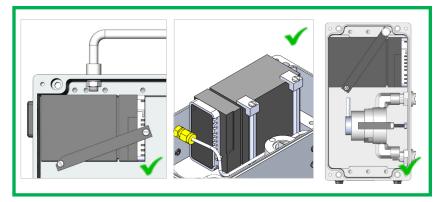
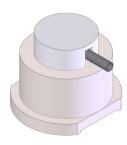


Figure 10: Battery positions in enclosure

- 8. Re-fit the front enclosure and secure it by tightening the enclosure screws with a flat screwdriver.
- 9. Switch on the unit to verify the procedure is a success. If the unit does not turn on, re-open it and check the assembly.



#### D. Replacing the Top Sensor Assembly This section applies to the GPR-1100, GPR-1200, GPR-x500, GPR-x800 (A)IS analyzers.



Part Number: B-2762-#

(To determine the option number, please refer to analyzer model)

- 1. Loosen the enclosure screws with a flat screwdriver to remove the front enclosure or lift the latches.
- 2. Unplug the top sensor wire from the main PCB by pulling the connector.

#### NOTE: Do not pull by the wire as this could cause damage.

- 3. Turn the star wheel underneath the sensor housing body assembly in a counter-clockwise direction until the top sensor is loose.
- 4. Disengage the top sensor assembly by turning it 90° counter-clockwise then pulling it as shown in Figure 12.



Figure 11: Sensor assembly connector on the main PCB

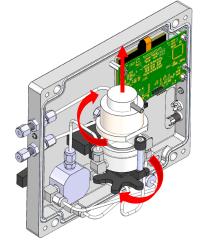


Figure 12: Removing the old top sensor assembly

- 5. Position the new top sensor assembly, ensuring the correct orientation.
- 6. Turn it 90° clockwise to re-engage, then secure it by turning the star wheel clockwise.

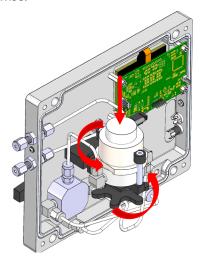
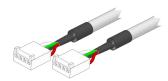


Figure 13: Placing the new top sensor assembly in the correct orientation

- 7. Plug the new top sensor assembly's connector into the main PCB.
- 8. Re-fit the front enclosure and secure it by tightening the enclosure screws with a flat screwdriver or locking the latches.
- 9. Switch on the unit to verify the procedure is a success. If the unit does not respond, re-open it and check the assembly.



#### E. Replacing the Sensor Cable This section applies to the GPR-1000, GPR-2000, and GPR-2500 analyzers.





Part Number: A-4251 A-4383-X (X is determined by sensor)

- 1. To remove the front enclosure, loosen the enclosure screws with a flat screwdriver or unlatch the box enclosure.
- 2. Unplug the sensor cable by pulling the connector or by unscrewing the connector fitting.

#### **NOTE:** Do not pull by the wire as this could cause damage.

- 3. Disconnect the other end of the sensor cable from the main PCB.
  - i. For GPR-2500, the main PCB is located inside the smaller enclosure. (See Figure 21)
- 4. Plug the new sensor cable to the sensor and main PCB.
  - i. For GPR-1000 and GPR-2000, ensure the wire is fed into the smaller enclosure through the grommet before plugging back to the PCB.
- 5. Re-fit the front enclosure and secure it by tightening the enclosure screws with a flat screwdriver or locking the latches.
- 6. Switch on the unit to verify the procedure is a success. If the unit does not respond, re-open it and check the assembly.

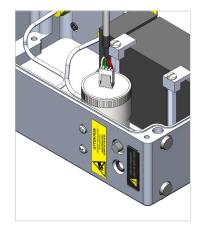


Figure 14: Sensor assembly connector on the main PCB



Figure 15: Unscrewing sensor cable A-4383-X

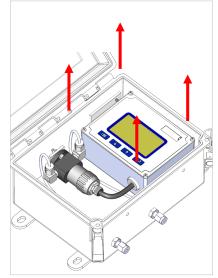
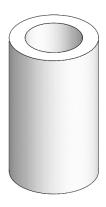


Figure 16: Location of main PCB the box enclosures



## F. Replacing the Coalescing Filter Element This section applies to the GPR-1200 and GPR-2000 portable analyzers.



Part Number: FLTR-1037

- 1. Locate the coalescing filter and drain all the liquid from the housing bowl.
- 2. Ensure there is no pressure in the housing and unscrew the housing bowl from the housing.
- 3. Unscrew the element retainer in a counter-clockwise direction, not by the filter.
- 4. Dispose of the old filter element and position the new filter element on the element retainer.
- 5. Reassemble the unit and ensure the element retainer and housing bowl are screwed on tightly to prevent leaks.



Figure 17: Unscrewing housing howl from housing



Figure 18: Unscrewing the element retainer



Figure 19: Element retainer and filter element



Figure 20: Filter with aluminum bowl



## G. Replacing the LCD Display Assembly This section applies to the GPR-x500 analyzer series.



Part Number: A-4462

- 1. Lift the latches to access the the LCD display assembly inside the box enclosure.
- 2. Remove the four screws with a Philips screwdriver.
- 3. Carefully lift the panel and detach the wire connectors from the main PCB.

#### **NOTE:** Do not pull by the wire as this could cause damage.

- 4. Remove the four standoffs from the PCB.
- 5. Carefully lift the main PCB upwards and pull out the LCD ribbon cable connector tabs to remove and release the cable.
- 6. Insert the new ribbon cable into the LCD display connector on the main PCB (see Figure 3) and insert the new LCD display assembly.

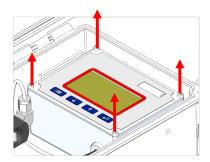


Figure 21: Removing the screws of the small enclosure top

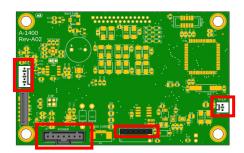


Figure 22: Removing the old top sensor assembly

- 7. Temporarily remove the short standoffs on the new LCD display assembly and line up the main PCB into the standoffs. Screw the short standoffs back into the assembly.
- 8. Insert all the wire connectors back into the main PCB.
- 9. Lay the assembly back in the small enclosure and secure with screws, ensuring all the wires are inside the enclosure.
- 10. Refit the box enclosure cover and lock the latches.

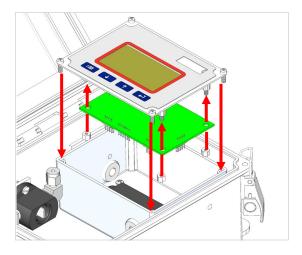
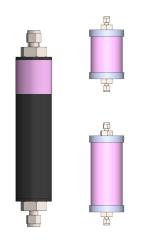


Figure 23: Placing the new top sensor assembly in the correct orientation



## H. Replacing the H2S Scrubber This section applies to the analyzers listed on page 4.



1. Locate the H2S scrubber and release from the tubing by unscrewing the fittings at both ends (see Figure 24).

- A. Online and loop units use A-3247.
- B. Portable units use A-2734-6.
- 2. Unlock the clasp by pulling each end in opposite directions to release the scrubber. Refer to Figure 25 for guidance.
- 3. Dispose of the old scrubber.
- 4. Place the new scrubber on the clasp and lock tightly by squeezing the sides together.
- 5. Reinstall the top and bottom tubes by screwing the fittings tightly to the scrubber.

Part Number: *A-3247 A-2734-6* 

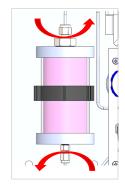


Figure 24: Remove fittings on both sides

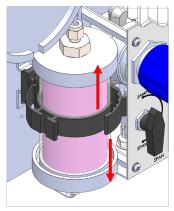


Figure 25: Opening the clasp

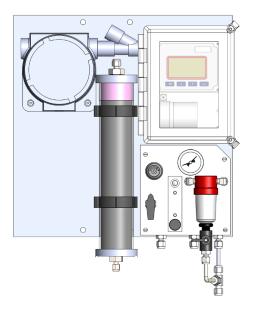


Figure 26: Example of scrubber placement on GPR-x500/GPR-x800 (A)IS



## I. Replacing the H2S Scrubber Media This section applies to the GPR-1200, GPR-2000, GPR-x500 and GPR-x800 (A)IS analyzers.



Part Number: CHEM-1008 (50lb) CHEM-1018 (50lb) CHEM-1008-2 (1L) CHEM-1018-2 (1L)

- 1. Locate the H2S scrubber and release it from the tubing by unscrewing the fittings at both ends.
  - A. Online and loop units use A-3247.
  - B. Portable units use A-2734-6.
- 2. Unlock the clasp by pulling each end in opposite directions to release the scrubber.
- 3. Twist open the large nut on the scrubber and dispose of the media.
- 4. If there are two types of media, open the other side and dispose of the second media.
- 5. Fill the scrubber by pouring the correct media into it
- 6. Screw the large nut back onto the scrubber tightly to close.

**NOTE:** If there are two types of media, fill the larger portion with the pink one and ensure the filled end is closed before refilling the other.

- 7. Place the scrubber back in the clasp and lock tightly by squeezing the sides together.
- 8. Reinstall the top and bottom tubes by screwing the fittings tightly to the scrubber.

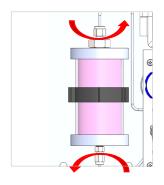


Figure 27: Remove fittings on both sides.

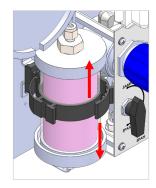


Figure 28: Opening the clasp.

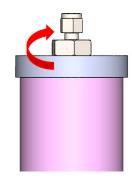


Figure 29: Unscrewing the big nut.

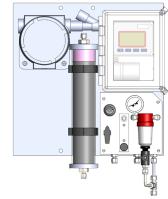


Figure 30: Example of scrubber in-situ on GPR-x500 and GPR-x800 (A)IS



#### J. Replacing the Sensor Seal This section applies to the GPR-1100 and GPR-1200, GPR-x500 and GPR-x800 (A)IS analyzers.



Part Number: ORNG-1007

- 1. To remove the front enclosure, loosen the enclosure screws with a flat screwdriver or unlock the latches to open the box enclosure (see Figure 9).
- 2. Turn the star wheel underneath the sensor housing body assembly in a counter-clockwise direction until the top sensor is loose.
- 3. Disengage the top sensor assembly by turning it 90° counter-clockwise then pulling it as shown in Figure 12.
- 4. Using a flat screwdriver, remove and dispose of the sensor seal as shown in Figure 32.
- 5. Apply vacuum grease to the new sensor seal and place it in the groove on the sensor housing body.

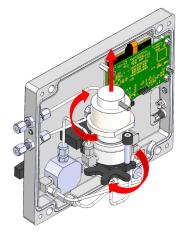


Figure 31: Removing the top sensor assembly



Figure 32:Removing the sensor seal from the sensor housing body

- 6. Position the top sensor assembly, ensuring the correct orientation.
- 7. Turn it 90° clockwise to re-engage, then secure it by turning the star wheel clockwise.

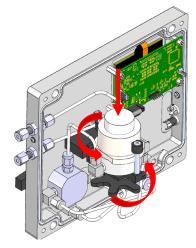


Figure 33: Placing the top sensor assembly in the correct orientation.

8. Re-fit the front enclosure and secure it by tightening the enclosure screws with a flat screwdriver, or by locking the latches.



## K. Replacing the Oxygen Sensor This section applies to all units listed on page 4.



Part Number: (Refer to User Manual for list of sensors available for each analyzer)

- 1. Loosen the enclosure screws with a flat screwdriver to remove the front enclosure or unlock the latches to open the box enclosure (see Figure 9).
- 2. Turn the star wheel underneath the sensor housing body assembly in a counter-clockwise direction until the top sensor is loose.
- 3. Disengage the top sensor assembly by turning it 90° counter-clockwise then pulling it as shown in Figure 12.
- 4. Dispose of the old oxygen sensor.
- 5. Remove the new sensor from its bag and place it inside the sensor housing. Refer to Figure 34 for the correct placement.

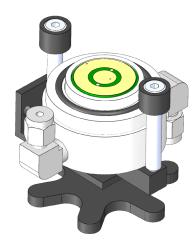


Figure 34: Correct sensor placement with the board side on top

6. Remove the grounding tape from the oxygen sensor and quickly replace the top sensor assembly, ensuring the correct orientation.

#### **NOTE:** Perform this procedure quickly to prevent damage to the sensor.

7. Turn it 90° clockwise to re-engage, then secure it by turning the star wheel clockwise.

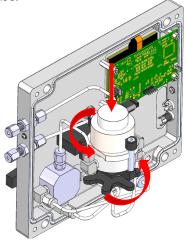


Figure 35: Placing the top sensor assembly in the correct orientation

8. Re-fit the front enclosure and secure it by tightening the enclosure screws with a flat screwdriver, or lock the latches to close the box enclosure.

