

Version

17

LDARtools

phx21™ Startup Guide

Rev. Date: February 28, 2022

To confirm that this is the most current version, please go to
<http://www.ldartools.com/documentation/>

OR

Go to the Customer Portal and Open the
“Docs” section.



Table of Contents

External Parts.....	1
Connecting the Probe.....	3
Disconnecting the Probe	3
Turning phx21 On or Off.....	4
Filling the phx21 with H ₂	5
Charging the phx21	6
Purging the Charger	7
Changing the Inlet Filter	7
Replacing the Probe Tip Filter.....	7
phx21 Application on the PDA.....	8
Starting the phx21 Application:.....	8
Tabs on the phx21 Application:	9
Probe Filter Status.....	9
Menu Options on phx21 Application:.....	10
Igniting the phx21	10
Manually Calibrating the phx21 After a 30-Minute Warm Up ..	11
Creating Daily Calibration Reports	12
Monitoring with the phx21	12
Error Messages from the phx21	13
LDARtools Technical Support	14

Welcome to the LDARtools Family

We are excited that you have chosen the phx21 as your VOC analyzer. The phx21 is designed to work for you.

If you are not getting the results you want, we **WANT TO HEAR ABOUT IT**—immediately.

Level 1 Repair Procedures are sent via email when issues are diagnosed. To protect the intrinsic safety of the phx21 analyzer, **ONLY** certified personnel may perform Level 1 repairs.

Make sure before beginning any on-site repair, please fill out the Report an Issue form on the LDARtools website and wait for response from our Support staff.

External Parts

- The **connection end plate (north overmold)** contains the following:
 - A. Bluetooth® antenna
 - B. Power button
 - C. Charger plug
 - D. Probe port
 - E. H₂ fill port



- The **phx21** case
 - Case is a solid aluminum piece with serial number and manufacturer information.



- The **FID end plate (south overmold)** contains the following:
 - A. FID exhaust (flame arrestor assembly)



Connecting the Probe

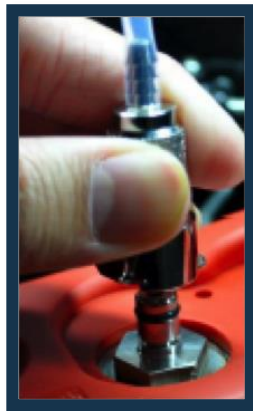
1. Align the quick disconnect, which is attached to **probe hose**, with the **probe port**.
2. Snap the quick disconnect cable into the **probe port**.

Note: The **probe** and a **probe tip filter** must be connected to the **phx21** before igniting the device.



Disconnecting the Probe

1. Press the tab on the quick disconnect to release **probe**.
2. Pull **probe** off gently.

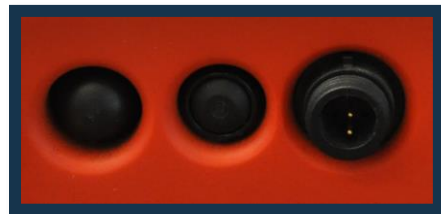


Turning phx21 On or Off

1. To turn the **phx21** on or off, perform one of the following:
 - a. ON: Press and hold the **power button** for 2 seconds.
 - b. OFF: Press and hold the **power button** for 5-8 seconds.
- B. The **power button** has several indicators that indicate the current status.
 - a. No light = Off.
 - b. Solid Green Light = On and the **phx21** is connected via Bluetooth®.
 - c. Blinking Green Light = On but the **phx21** is not connected via Bluetooth®.



Device is turned on.



Device is turned off.

Filling the phx21 with Hydrogen

Gases are typically stored under pressure in metal cylinders. Cylinders are designed to withstand high pressures. Improper handling and use of compressed gases can result in devastating consequences. Be sure to follow all safety guidelines outlined by your facility.

1. Remove the **H₂ quick-fill cover (LDAR #747)**.
2. Make sure of the following:
 - The **H₂ cylinder** being used to fill the **phx21** has a regulator in place.
 - Use the *phx21 Vitals Chart* to set/check cylinder pressure.
 - Verify no dust or debris is present in the **H₂ fill port** or the **H₂ fill adapter (LDAR# 1260)**.
3. Connect the **probe** to the **probe port**.



4. Connect the **H₂ fill adapter** to the **H₂ fill port**.



IMPORTANT: Do *NOT* attach the **H₂ fill adapter** to the **probe port**.
This will lead to a costly repair.

5. Turn the handle 180° counterclockwise to open the valve.
6. Wait for 4-5 seconds while your H₂ supply is replenished.
7. Turn the handle 180° clockwise to close the valve. There will be a slight hiss from the release of pressure.

8. Pull on the collar of the **H₂ fill adapter** to release it.



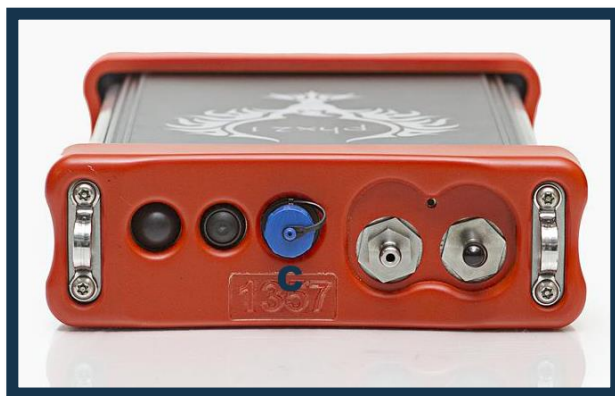
9. Twist the **H₂ quick-fill cover** onto the **H₂ fill port**. The **phx21** MUST be operated with the **H₂ quick-fill cover** in place at all times. It is recommended to keep replacements on site.

Charging the phx21

1. Obtain a **phx21 charger** (LDAR# 762).
2. Turn off the **phx21** by pressing and holding the **power button** for 5-8 seconds.
3. Twist the blue **charger jack cap** (LDAR# 646) counterclockwise to access the **charging port**.

IMPORTANT: The *charger jack cap* **MUST** be in place while using the **phx21** in a hazardous area.

4. Align the grooves of the **phx21 charger** and the **charger jack**.



5. Twist the turning collar on the **charger** connector clockwise. A light on the **charger** will flash when the connection is successful. The light should blink until the **battery** is charged. Once charged, the light will remain solid.

Purging the Charger

1. Connect the **charger**.

Note: The **battery** will not charge while the **pump** is on and the **phx21** will run as long as H₂ is available.

2. Turn off the **phx21** by pressing and holding the **power button** for 5-8 seconds.
3. Unplug the **charger** and wait for 5 seconds.
4. Plug the **charger** back in. The **phx21** will now charge properly.

Changing the Inlet Filter

1. Turn the **probe port** counterclockwise by hand using the **socket 3/8" drive 5/8"** (**LDAR# 969**).
2. Remove **probe port**. If dirty, do not clean. Replace the **inlet filter (LDAR# 825)**.

IMPORTANT: Cleaning will damage pump. Replace and notify management technicians are not using **probe tip filters**. Do *NOT* use **TVA cup filters**.

3. Screw the **probe port** into the **phx21** clockwise.
4. Tighten the **probe port** with the provided **socket 3/8" drive 5/8"** by hand. Do *NOT* use a wrench.

Replacing the Probe Tip Filter

1. Locate the **probe filter** between the **probe tip (LDAR# 1091)** and the **probe**.
2. Make sure the **pump** is off before removing the old/contaminated filter.
3. Remove the dirty filter, and then attach the **probe tip** to a clean filter. LDARtools offers two types of filters: **Probe Filter-Double Thread (LDAR# 025)** and **Probe Filter (LDAR# 1264)**.

IMPORTANT: A **probe tip filter** must be in place at *ALL* times while the **phx21** is running.

phx21 Application on the PDA

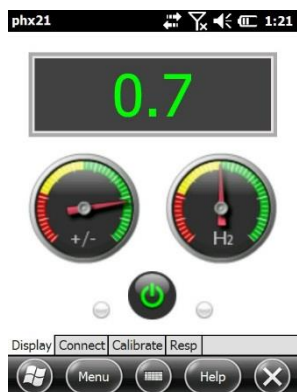
Before any repairs are performed on-site, you must fill out the Report an Issue form on the LDARtools website. You will receive instructions and procedures via email.

Starting the phx21 Application:

1. Tap the **Start** button, and then tap **LDARtools**.
2. Tap the **phx21**. You will be prompted to connect to a **phx21** device. The application will list all **phx21s** in range.
3. Tap the **phx21** device you wish to connect to. A connecting message will appear. You will be directed to the **Display** tab once connection is complete.
4. If connection fails, power off the **phx21** then do another “Refresh”, power the **phx21** back on, “Refresh” again, then tap the **phx21** you want to connect to.

Tabs on the phx21 Application:

1. The **Display** tab provides information on the **phx21** connected to the Archer:



- The main display shows the PPM reading.
- The left gauge indicates the **phx21**'s battery level.
- The right gauge indicates the **phx21**'s H₂ level.
- The **Ignite** button is the circular on/off button in the center.
- The status light on the left shows data is being received from the **phx21**.
- The status light on the right shows the pump is running and the **probe filter** status.
- The timer under the H₂ gauge is the estimated hours and minutes left before you run out of H₂.

2. The **Connect** tab allows you to connect to other **phx21** devices that are in range.
3. The **Calibrate** tab provides access to the calibration options that you can initiate.
4. The **Resp** (Response) tab is currently not in use.

Probe Filter Status

1. The **probe filter** is clean.
2. The **probe filter** is dirty and the **pump**'s power is increased to maintain accuracy.
3. The **probe filter** is very dirty and needs to be replaced. The **pump**'s power is increased further.
4. The filter needs to be replaced. The **pump** is running on max power and will turn off in 60 seconds to avoid damage.

Menu Options on phx21 Application:

1. Tap **Menu**.
2. Tap either:
 - a. **Bleed** to access the screen to bleed or empty the H₂ bottle.
 - b. **Save Data** to save information to the **phx21**'s memory.

IMPORTANT: The **Details** and **Settings** menu options are only used under the guidance of an LDARtools Technical Support Specialist. If you accidentally accessed either option, you must close the onscreen keyboard to view the **OK** and **Cancel** buttons.

Igniting the phx21

1. Go to the **Display** tab.
2. Tap the **Power** button in the middle. The **phx21** will attempt to ignite.
3. Wait for either of the following:
 - a. The button turns **gray**: Ignition is unsuccessful.
 - b. The button turns **green**: Ignition is successful.
4. If ignition fails, Tap **Re-ignite using Secondary**. If ignition problems still continue, please click the Report an Issue on the LDARtools website to let us know.

Manually calibrating the phx21 After a 30-Minute Warm Up

The **phx21** should not be calibrated with on-demand regulators as they do not consistently simulate the monitoring process. The vacuum required to open and hold open the valve can and does affect calibration accuracy. If there is no other option, apply gas for 20 seconds before starting calibration.

Before you begin manually calibrating with gas bags, please take note of these precautions to ensure the most accurate calibration possible:

- LDARtools recommends using a SpanBox or 25 liter cal bags—available at the LDARtools webstore (**Calibration Bags 25L – LDAR #862** for TVA and **phx21**).
- When filling bags, do not fill them completely. Doing so is not only bad for the bag, it can also cause calibration issues.
- Make sure the bag is not pinched or pressed during calibration.
- Once the cal bag is connected to the **phx21** and before you tap **Begin**, wait an ample amount of time to let it sit and purge.
- Make sure the cal bag valve is fully open to ensure proper flow.
- Always start with the lower concentration and work your way up to the highest concentration when calibrating, drifting, or confirming the calibration.
- Each calibration span event overwrites all prior calibrations to that span and sets the Analyzer precisely to the concentration that was JUST introduced. Doing multiple back-to-back calibrations with different probes, for example, does nothing but overwrite the previous calibration. If you drift later, you can only drift to the MOST RECENT calibration.

1. Go to the **Calibration** tab.
2. Tap **Cal. Zero**.
3. Apply the Zero Gas, then wait 10 seconds if using bags.
4. Tap **Begin**.
5. Let the calibration run. The **phx21** will sample the gas three times, then display the *Calibration Complete* message.
6. Tap **Cal. Spans**.
7. Tap **Add**.

8. Type the Target PPM for the span gas.
9. Type the Actual PPM for the cylinder.

IMPORTANT: You must always calibrate a span between 90 and 1500 PPM. Failure to do so will cause unpredictable calibration results.

10. Tap **OK**.
11. Repeat Steps 7-10 until all the Calibration Spans have been added. This only needs to be setup once.
12. Tap **Next**.
13. Apply the span gas to the probe, then wait 10 seconds if using bags.
14. Tap **Begin**. The **phx21** will sample all the Calibration Spans entered three times automatically. A progress bar will indicate “Calibration Complete” when the **phx21** finishes sampling gases.

Tech Tip: If you experience high Response Times, please Report the Issue to support@ldartools.com.

Creating Daily Calibration Reports

The **phx21** does not automatically create daily calibration reports when the device is manually calibrated.

If you were previously using Cal2.0 onsite, please contact an LDARtools Sales Specialist for assistance in adapting the reporting features for use with the **phx21**. Do either of the following:

- Call (877-788-1110 ext. 2)
- Email sales (sales@ldartools.com)

Monitoring with the phx21

1. Tap **Monitor**.
2. Tap **LTI Mobile**.
3. Fill in the information to start monitoring.
4. Tap the **Monitor** tab. Tap **Monitor**. The **phx21** monitoring screen will appear.

Monitoring with the phx21

If a **phx21** flames out for any reason, relight as soon as possible. A properly functioning machine will reliably detect deflections within 1 min. Depending on the time spent flamed out, you may need to wait up to 30 minutes for the machine to perform to standard specifications. For best drift performance, the **phx21** should be ignited for 30 minutes before any drift checks.

Error Messages from the phx21

1. If the flow is obstructed slowly due to a dirty filter:

“Maximum Pump Power Level reached. Please check your probe for obstructions or replace your probe filter.”

2. If air sample pressure is low due to a sudden blockage (kink, water in filter, blocked probe inlet):

“Air sample pressure low! Please check your probe for obstructions or replace your probe filter.”

Storage and Use Conditions

Overnight equipment storage and calibration must be done indoors at or near room ambient conditions(15-25C) with a maximum humidity of 85%.

LDARtools Technical Support

At LDARtools, we want to ensure that you get the maximum performance from all of the software and equipment that we offer. We have made every effort to provide you with a comprehensive manual to assist you with using our products. If you are having issues with any of our products, please contact us for assistance right away.

For general questions, you can consult a member of LDARtools Technical Support Team by emailing support@ldartools.com.

For equipment issues and before beginning any repair contact LDARtools Technical Support Team by following the below directions:

1. Report an issue at LDARtools.com. Click Support then Report Hardware Issue.
2. Issue MUST include the log and span file from the analyzer you are reporting at the time the issue was occurring. See Report an Issue page for instructions.
3. If a confirmation email is not received within 30 minutes please email support (support@ldartools.com).
4. Stand by for instructions from the LDARtools Technical Support Team.

IMPORTANT: Equipment being shipped to LDARtools for repair must have a Return Merchandise Authorization (RMA) printed and in the box. Failure to do so will result in extra processing and diagnostic expense and time. The only exception would be written instructions from LDARtools Technical Support Team.