User Manual

YELLOW JACKET®

YJACK VAC® Vacuum Gauge

Bluetooth® Sensing Technology

Contents

YJACK VAC® Getting Started

Introduction

Thank you for your purchase of the YELLOW JACKET® YJACK VAC® Bluetooth® Sensing device.

Take a moment to familiarize yourself with your new device(s). You will notice that all YJACK® devices feature a simple on/off button to power cycle the device. The YJACK VAC® comes with a quick coupler for system attachment to aid in the proper positioning of the device within your workspace. Each YJACK® product is powered by (2) AAA batteries housed beneath the removable battery door on the back of the device. The procedure to replace the product batteries is the same across all YJACK® devices.

The YJACK VAC® includes an integrated Electronic Paper Display (EPD) which can provide feedback as to the device's current mode of operation. During normal operation, the status indicator LED will flash yellow once every two seconds to indicate that a measurement has been transmitted via Bluetooth®.

Unlike other Bluetooth® devices, YJACK® devices do not require "pairing" or an established connection between one another or the user's smart device to transmit and receive information. Simply power the device on and it will immediately begin broadcasting data to other available devices within the broadcast range.

YJACK® tools may be used individually or together, broadcasting up to (6) unique measurements to one P51-870 TITAN® or TITANMAX® Digital Manifold (see firmware requirements) or an unlimited number of unique measurements to a smart device running the YJACK VIEW® app smart application.

To order accessories, receive assistance, or locate the nearest YELLOW JACKET® distributor, contact Ritchie Engineering Company, Inc.

Corporate Office and Mailing Address:

Ritchie Engineering Company, Inc.
YELLOW JACKET® Products Division
10950 Hampshire Avenue South
Bloomington, MN 55438-2623 USA
Phone: (952) 943-1300 or (800) 769-8370
Fax: (800) 769-8370
E-mail: custserv@yellowjacket.com
www.yellowjacket.com

Safety and Warning Information

Use the YJACK® Series of Bluetooth® sensing devices only as specified in this manual.

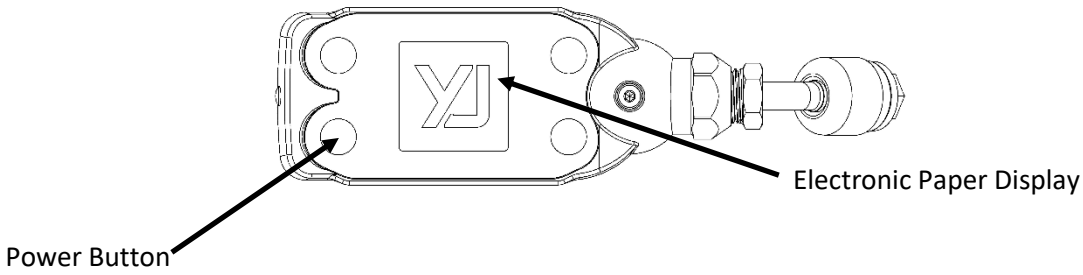
- Most governments and legal authorities require that HVAC technicians be trained and certified in the safe and proper operation of HVAC tools, such as these instruments.
- Read the entire User Manual before using the instrument.
- Do not use the instrument if it is damaged. Before you use the instrument, inspect the case. Look for cracks or loose components.
- The instrument contains no internal user serviceable parts, except for the AAA batteries.
- Do not open the instrument. Have the instrument serviced only by Ritchie Engineering Co. or authorized service centers.
- Do not use the instrument if it operates abnormally. Protection may be impaired. When in doubt, have the instrument serviced.
- Do not operate the instrument around explosive gas, vapor, or dust.
- Do not operate the instrument outside of its rated specifications, outlined later in this manual.
- Always wear eye and skin protection when working with refrigerants. Escaping refrigerant vapors will present a freezing danger. Do not direct refrigerant vapors venting from hoses towards the skin.

Using Your YJACK VAC® Device

To operate, remove the red plug from the brass quick coupler nut. Then the device can be attached directly to the side port of a core removal tool or to a system service port. A 5/16” adapter (19121 straight or 19221 90° degree) can be used for systems with 5/16” connections. For the most accurate system vacuum readings and to avoid contamination of the sensor, it is not recommended to connect the vacuum gauge directly to the vacuum pump.

Powering the Device On

The YJACK VAC® device utilizes the power switch and an integrated display. Press and hold the power button to power on the device. Release the power button when the display image changes or the status indicator LED illuminates.



Status LED: What Does it Mean?

Once powered on, the LED will flash every time the YJACK VAC® device readings are broadcast, every 2 seconds. When the battery level reaches 10%, the LED will flash red to indicate the low battery condition. When powering off the device, the LED stays red until the power button is released and the device is powered down.

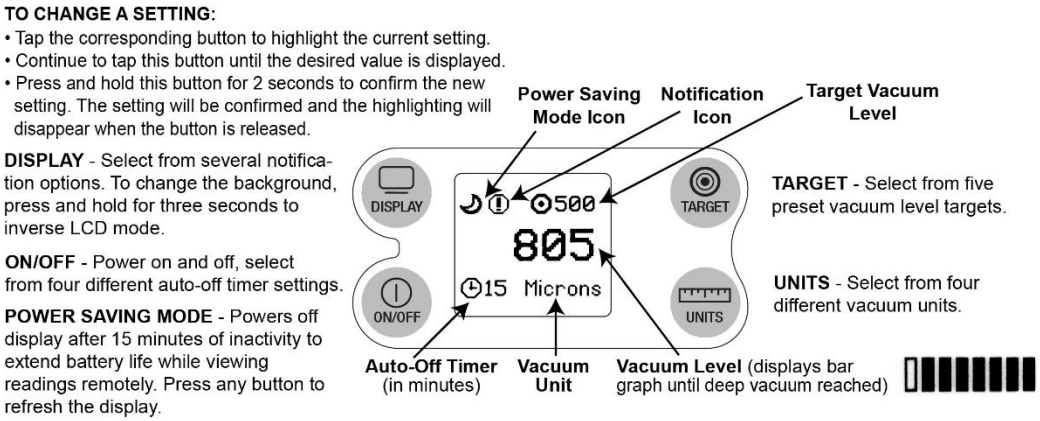
Changing the Batteries

Each YJACK VAC® product is powered by (2) AAA batteries housed beneath the removable battery door on the back of the device. Using your finger or a flat blade, pry up on the battery door to remove it from the device. Remove the batteries and place (2) new AAA batteries into the battery holder. Reference the required polarity of the

batteries molded into the battery holder. Replace the battery door by inserting the tab on the inside edge of the door into the slot in the module enclosure and then press down on the battery door until it snaps into place.

Changing the Display and Settings on the YJACK VAC®

The diagram below outlines the button functions and device settings for the YJACK VAC®:



YJACK VAC® Vacuum Gauge Specifications

The following table outlines the specifications for the YJACK VAC® product.

Warranty: 2 years
IP Rating: IP-52
Battery Type: 2 x AAA (Included)
Radio Version: Bluetooth 5.2 Compliant Low Energy
Bluetooth Range: 1000 feet (304 meters) line-of-sight**
Communication Interface: YJACK VIEW® App, TITANMAX®, & P51-870 TITAN® Digital Manifold
YJACK VAC® mounts directly to system service port.
**Radio interference and nearby obstructions may reduce signal strength

67066 YJACK VAC® Vacuum Gauge

Measurement Type	Vacuum
Weight	0.39 lb. (180 g)
Dimensions	6.5"L x 1.8"W x 1.5"H (165 x 45 x 38mm)
Tether Length	N/A
Operating Temperature	5°F to 122°F (-15°C to 50°C)*
Storage Temperature	-4°F to 140°F (-20°C to 60°C)
Battery Life	Up to 240 hours
Quick Coupler Fitting	1/4" Flare w/ Depressor
Vacuum Measurement Range	1 to 760,000 microns with YJACK VIEW app, 1 to 99,999 microns on integrated display
Vacuum Measurement Accuracy	+/- 20% of reading from 10 to 25,000 microns
Units of Measure	microns, Torr, mTorr, mbar, mmHg, Pa
Auto-Off Timer	Adjustable from 15 minutes to never

*Operating temperature is restricted by integrated display; range is extended when using with YJACK VIEW® app

Using With a P51-870 TITAN® and TITANMAX® Digital Manifold

To use the YJACK VAC® Sensing device with the P51-870 TITAN® and TITANMAX® Digital Manifolds, ensure that the firmware version is up to date. The YJACK VAC® is used in the P51-870 TITAN® and TITANMAX® evacuation session. If a firmware update is required, reference the "P51-870 TITAN® and TITANMAX® Digital Manifold – Firmware Update" for details on updating the firmware.

Using with a TITANMAX®

Once the refrigerant has been recovered from the system, the TITANMAX® can be used to accurately monitor the system evacuation. Evacuation menu displays the current vacuum pressure in digital and graphical form, target vacuum level, and the vacuum hold timer.

Connecting to the TITANMAX®*:* Turn on the TITANMAX® click on Available devices. Select the YJACK VAC® that you wish to use for the Evacuation Session, it should turn Green to indicate it is selected. Select the main menu then select Evacuation Session. The TITANMAX® will be pulling the data from the YJACK VAC®, and the Bluetooth® icon will appear next to the micron reading on the screen indicating that the vacuum data is being provided by the connected YJACK VAC®.

System vacuum reading is displayed in real time as a numeric representation and as represented in a graphical format as a line graph. While evacuating the system, the TITANMAX® will display microns numerically from atmosphere down to the 1,000-micron vacuum level after which it will accurately measure and display down to 5 microns numerically and on the line graph.

Interpreting the Evacuation Graph: The evacuation menu features a fully functional evacuation line graph. The evacuation graph starts showing graphing on the y-axis once the current vacuum reading falls below 1000 microns. The evacuation numerical reading reads from atmospheric all the way into a deep vacuum, but the graph shows data trending once the 1,000-micron level has been reached. A leader line is used to plot new data from left to right. This function allows the user to compare old data to newer data as each measurement is recorded and displayed. The line graph fully overwrites the old data every 300 seconds (approx. 5 minutes) and will begin again from the left side of the graph.

Operating the Evacuation Menu: Before beginning an evacuation, connect the YJACK VAC® Device to the system at a sufficient distance from the vacuum pump such that it will not disturb the vacuum reading. Use the "Target" and "Hold" buttons to set the target vacuum level and vacuum hold timer respectively. Pressing each of these buttons will bring up a keypad to type in numbers between a range of available values, with the last value selected being automatically saved. Target vacuum level can be adjusted in whole integer increments. Vacuum hold timer can be adjusted in integer increments between 1 and 30 minutes. The user will start a vacuum hold test by tapping the button "HOLD TEST" the user will be taken to the pressure rise setup screen If the "CANCEL" button is pressed, the user will remain on the evacuation screen.

NOTE: Using the vacuum hold timer can help to ensure that all refrigerant has been evacuated from the system and the system is free of non-condensables. Refrigerant and non-condensables can cause the vacuum level to rise in a system giving a false positive during a leak test when no leak is present. However, all refrigerant and non-condensables (moisture) should be completely evacuated to confirm the system is evacuated properly and leak free ensuring a Negative Leak test result prior to charging the system.

Using With a P51-870 TITAN®

Evacuation Mode Overview: Once the refrigerant has been recovered from the system, the P51-870 TITAN® can be used to accurately monitor the system evacuation. Evacuation mode displays the current vacuum pressure in digital, analog, and graphical form, percent change per minute, estimated time remaining, target vacuum level, and the vacuum hold timer.

Connecting to the P51-870 TITAN®: Turn on the P51-870 click on Evacuation. Press on the gauge and select the YJACK VAC® that you wish to use for the Evacuation Session. The selected device will turn green. select the BACK button and the P51-870 TITAN® will be pulling the data from the YJACK VAC® on the screen. System vacuum pressure is displayed in real time as a digital representation as denoted by Pvac, analog as represented by a graphical format as a logarithmic line graph. While evacuating the system, the P51-870 TITAN® will display 100,000 microns from atmosphere down to the 100,000 micron vacuum level after which it will accurately measure and display down to 5 microns.

Interpreting the Evacuation Graph: In addition to the evacuation gauge, evacuation mode also features a fully functional evacuation line graph, the evacuation graph features a logarithmic y-axis. This means that the evacuation graph captures the full scale of an evacuation but is more precise in a deep vacuum allowing the user to observe small fluctuations in vacuum pressure. An orange leader line is used to plot new data from left to right. This function allows the user to compare old data to newer data as each measurement is recorded and displayed. The line graph fully overwrites the old data every 200 seconds (approx. 3.5 minutes) and will begin again from the left side of the graph.

Operating the Evacuation Mode: Before beginning an evacuation, connect the YJACK VAC® to the system at a sufficient distance from the vacuum pump such that it will not disturb the vacuum reading. Use the "Target" and "Hold" buttons to set the target vacuum level and vacuum hold timer respectively. Pressing each of these buttons will cycle between a range of available values, with the last value selected being automatically saved. Target vacuum level can be adjusted in 6 increments: 200, 300, 400, 500, 750, 1000 microns (or equivalent selected vacuum unit). Vacuum hold timer can be adjusted in 7 increments: 1m, 3m, 5m, 10m, 15m, 30m, None. The session timer, displayed in the top right corner will begin incrementing the moment evacuation mode is entered. Use the session timer to monitor the overall length of the evacuation session. While evacuating a system the %/min will change to reflect the current % change in vacuum pressure every minute. A larger number will indicate a faster evacuation rate than a lower number. Additionally, the estimated time remaining is denoted by ETR and will adjust based on the current %/min and the target vacuum level setting. Once the set target vacuum level has been reached, the vacuum hold timer will start to deplete. When the hold timer reaches zero, an alarm will sound indicating the evacuation has been completed. In addition, the user will be prompted to start a pressure hold test. By tapping the button "Begin Pressure Hold Test?" the user will be taken to the pressure rise setup screen and the alarm will be silenced. If the button is not selected, the user will remain on the evacuation screen. To silence the alarm, adjust the desired target vacuum level and continue the evacuation or select a new mode of operation. If the vacuum hold timer is not desired, simply tap the Hold button until NONE is displayed.

Using in the YJACK VIEW® App

The YJACK VIEW® smart application provides a simple yet comprehensive interface to display, analyze, and record the data from the YJACK VAC® Bluetooth® device. The YJACK VIEW® smart application is compatible with all YJACK®, TITANMAX® and P51-870 TITAN® devices (firmware version v4.0 or later). Freely navigate between available session types: Pressure/Temperature, Psychrometrics, Evacuation, Leak Test, Electrical, Charging & Recovery, Anemometer, Static Pressure and Combustion.

Easily place and monitor status of all YJACK®, TITANMAX® and P51-870 TITAN® devices from one Available devices screen. Datalog allows recording multiple devices with multiple sampling intervals. Generate customized and detailed service reports capturing system readings and equipment information. The app is available for both iOS and Android smart devices through the App Store and Google Play Store, respectively. Be sure to download any available app updates as they will include new features and app enhancements. Open the camera app on your Android or iOS smart device and scan over the QR codes or click on the links below to go directly to the app store pages:

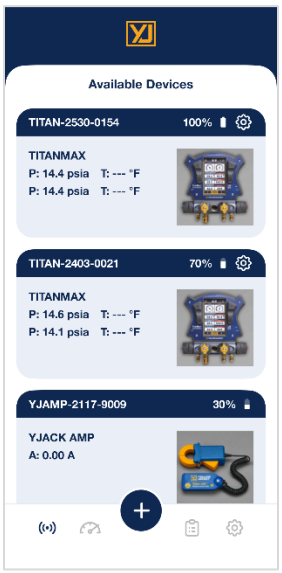
https://play.google.com/store/apps/details?id=com.ritchieengineering.yjackview

Google Play Store for Android™ devices

https://apps.apple.com/us/app/yjack-view/id1492358956

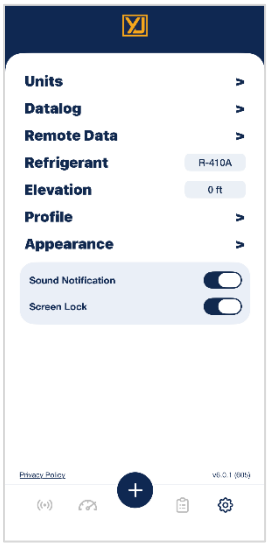
App Store for iOS devices

Available Devices



Upon selecting Available devices in the app, a list of available devices will appear. If there are no P51-870 TITAN®, TITANMAX® or YJACK® devices turned on and within range, no devices will be listed, but as these devices are powered on, they will populate on this screen. Each device that appears on the list of available devices includes some basic information about the device. This includes the device serial number/Bluetooth® ID, the battery level, and any readings that the device is broadcasting. Keep in mind that the YJACK PATH® can be utilized to repeat the readings from any P51-870 TITAN®, TITANMAX® or YJACK® device, improving the connection range. If a device moves out of range or is turned off, it will display on the available devices screen with a red banner. If this occurs make sure the device is turned on and moved back within range, possibly by relocating the YJACK PATH® device.

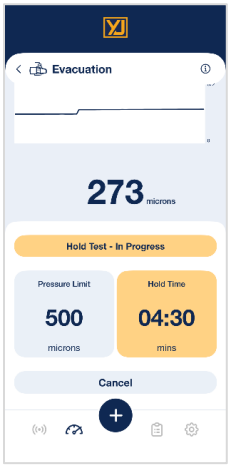
General Settings



Before starting any system readings session with the YJACK VIEW® app, make sure the app settings are configured to your preferences. Press on the gear icon in the lower right corner of the screen. A list of configurable settings will appear including Units, Datalog, Remote Data, Refrigerant, Elevation, Profile, and Appearance. From the settings home screen, you can also turn on and off sound notifications and the screen lock functions. Units will allow you to set your preferred units of measurement for pressure, static pressure, temperature, weight, vacuum pressure, distance, power (energy), airflow, and airspeed. Once the proper settings have been selected, press “Save.” To select your refrigerant type, select the refrigerant label and a list of over 126 selectable refrigerants will appear. Next to each refrigerant name, there is an outline of a star. Pressing on the star icon will turn the star solid yellow and classify that refrigerant as a favorite. Favorite refrigerants will always appear at the top of the refrigerant selection screen for easy access. To remove a refrigerant from the list of favorites, simply press on the solid yellow star next to the desired refrigerant and it will instantly be removed from the list of favorites. Once the favorites have been configured as desired, and the proper refrigerant has been selected, press Save. The final app configuration setting is to set the elevation where the service is being performed. Select the elevation label, enter the elevation where service is being performed and press “save.” Additionally, from the settings screen, the user profile can be edited. Select the profile label and complete the user information. This data is not stored outside of the app. Finally, the app is available in light or dark mode. Under appearance, select desired appearance option and select “close”. Datalog and Remote Data are also available from the settings menu. These

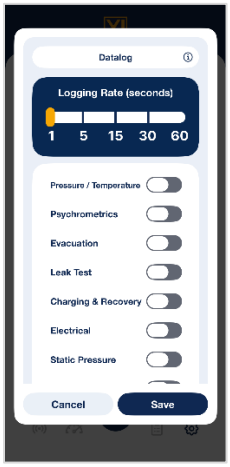
will be discussed in more detail below. Now that the app settings have been configured. The session type can be selected, select the gauge icon to navigate to the sessions home screen.

Evacuation



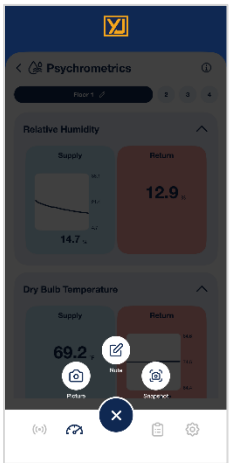
The Evacuation session type displays the system vacuum level from any vacuum device plugged into a P51-870 TITAN®, TITANMAX®, or YJACK VAC®. The first time an Evacuation session is started, the vacuum measurement will need to be assigned to the specific vacuum device. Tap the System Vacuum graph/number. A list of available devices broadcasting vacuum measurements will appear. Select the correct device being used with the vacuum device. Once assigned, the system vacuum level will be displayed. If the system is initially at atmospheric pressure, the reading is displayed as 760,000 microns (or other unit equivalent) until the system vacuum drops below that level. From the Evacuation reading screen, a target vacuum pressure and hold time can also be set. To set the target vacuum pressure, press the Target Vacuum display box. Enter the target vacuum pressure and press “Save.” Follow the same process for the Below Target Time. Once the system vacuum level reaches the target pressure and stays below for the Below Target Time, the Status will change to Yellow Stating “Evacuation Complete”. It will ask you to start a Hold Test, you need to input a Hold Test Time and Pressure Limit (maximum acceptable pressure during hold test) then hit Save and Start Test. A message will appear indicating that the hold test has completed. The vacuum reading assignment is stored in the app memory for future sessions, but the assignment can be changed at any time by pressing on the system vacuum reading.

Create Datalog



Datalogs can be created to log readings during any of the session types or individual sensors. To start a datalog from within any session, press on the gear icon in the upper right corner of the screen and select Datalog. From this screen you can select the logging rate, which is how frequently the readings will be logged, and which session type to log readings from. Multiple session types or sensors can be selected if desired, but keep in mind that only one session screen can be displayed within the app at any given time. Once the logging rate and session type(s) have been selected, press save. A recording icon and timer will display in the upper right corner of the screen. When you are ready to start recording data, press on the red circle “record” icon to begin the datalog. The timer will count from the time that the datalog was started. When you are ready to stop the datalog, press on the red square “stop” icon. You can then select to either save or discard the log file. If you wish to save the log file, a list of available save options will appear.

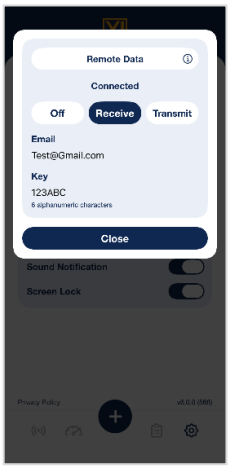
Take Report Snapshot, Picture, or Note



Report snapshots, photos, or notes can be recorded to reports during any of the sessions. To take a data snapshot, photo, or note from any active session, press on the plus button in the center of the quick access menu. Select report, photo, or note from the submenu.

To save snapshot, picture, or note, you will be prompted to select which customer/job from a dropdown menu. If the customer or job does not exist, you may create a new one. Repeat process for which report and report section to save within the customer/job. Finally, give the snapshot, picture, or note a title. Press “save.” Reports can be accessed by selecting the clipboard icon on the bottom left of the screen.

Remote Data



Remote Data shares live sensor readings with another user to enable real-time troubleshooting and remote monitoring. To activate remote data, select the gear icon on the bottom right to access the settings page. Select “Remote Data”

To Transmit Data

To share your data with another user or device, enter your email and a case-sensitive 6-digit key. Select the “Transmit” button on the right. Select “Close.”

To Receive Data

To receive Remote Data, enter the same email and case-sensitive key as the transmitting device and select “Receive”. Select “Close.”

Use the receiving device to navigate to the desired session and select the active YJACK®, TITANMAX®, or P51-870 TITAN® Devices.

Create Report

Reports can be used to save information or share with a customer. To create a report, select the clipboard icon on the right side of the quick access menu. You must select a customer/job or create a new customer/job to create a new report. To create a new customer/job, click the plus button in the middle of the quick access menu and select “Job”. Enter the job name and/or customer information and select “new”.

Select the customer/job within the list. To create a new report, click the plus button in the middle of the quick access menu and select “Report”. Enter the report information and select “new”. Select the newly created report to edit. Select the plus button in the middle of the quick access menu to add pictures, notes, or an additional section to keep the report organized. The pencil icon in the upper right corner of each section allows for edits.

Additionally, from active sessions you can create reports after taking a snapshot, picture, or note.

When your report is completed, select the plus button in the middle of the quick access menu and select “Generate”. Your report will be created in PDF format with the ability to share to a contact or downloaded to your device.

Troubleshooting & FAQs

Q: Why is my YJACK VAC not reading the correct vacuum?

A: Most likely the sensor got contaminated with oil, best option is to clean the vacuum sensor, see Vac Sensor Cleaning instructions on the Website product page under "Documents" tab. Link to instructions

Q: Why am I losing my Bluetooth® connection when I am within 1000' of the YJACK® device(s)?

A: With any radio technology, when you start to add obstructions between the transmitter and the receiver, the ultimate range may decrease as different objects interfere with the radio signal in different ways. The more obstructions you add between YJACK® device and either the P51-870 TITAN®/ TITANMAX® or the smart device running the YJACK VIEW® app, the weaker the signal may become after it has passed through or around the obstacles. This could ultimately lead to a shorter maximum range, but this can be improved by using the YJACK PATH® signal repeater device. All YJACK® devices (minus the YJACK MANO® and YJACK DEW®, they run on Bluetooth® 4.2), including the YJACK PATH®, utilize a Bluetooth® 5.2 compliant low energy radio to ensure the best possible range, however each situation will be slightly different depending on the environment/ surroundings you are working within. The YJACK PATH® can be positioned to get around obstructions and up to 6 YJACK PATH® devices can be used simultaneously to maximize the connection range, even in environments with multiple obstructions.

Q: Why doesn't my TITANMAX® show up on the list of available devices within the YJACK VIEW® app?

A: The app must be version 5.0 or higher.

Q: Why doesn't my P51-870 TITAN® show up on the list of available devices within the YJACK VIEW® app?

A: The radio inside the P51-870 TITAN® must be programmed with radio firmware version 2.01 or higher. This firmware version includes critical updates for communication with the YJACK VIEW® app. The firmware can be updated over-the-air through a Bluetooth® connection to a Windows or MacOS device. The radio firmware updater files are available on the P51-870 TITAN® (40870) product webpage under the "Documents" tab (https://yellowjacket.com/product/p51-titan-digital-manifold).

Q: Why are the YJACK® devices not showing up on my TITANMAX®?

A: Only devices required for providing data to the sessions on the TITANMAX® will be displayed in the available device session.

Q: Why are the YJACK® devices not showing up on my TITANMAX®, or P51-870 TITAN®?

A: The circuit board inside the TITANMAX® and P51-870 TITAN® must be programmed with USB firmware version to the latest version available on the yellowjacket.com website to recognize the YJACK® series of devices. If the TITANMAX® or P51-870 TITAN® firmware version that is displayed during power up is older than the version on the website, the firmware must be updated through a USB connection to either a Windows or MacOS device. The firmware updater files are available on the P51-870 TITAN® (40870)/ TITANMAX® (40881) product webpage under "Firmware Update"

Spare Parts

69026 Replacement Battery door
19020 Replacement Gaskets for ¼" & 5/16" (10 pack)
19189 Replacement Brass Connector (1/4" Female QC 45° x 1/4" NPT Male)

Accessories

69030 Vacuum sensor Cleaning Kit