eVac™ Pro Programmable Digital Vacuum Gauge

Operation and Maintenance Manual

Introduction

Thank you for your purchase of the YELLOW JACKET® eVac Pro Digital Vacuum Gauge. With the eVac Pro, you can accurately measure vacuum pressure in Microns, Pascals, Millibar, Millitorr, mmHg, PSI, and inHg with resolution down to 0.1 micron. Ideal for the HVAC/R, industrial, and scientific professionals, the eVac Pro is small, lightweight, rugged and easy to use. It is programmable, allowing for unattended evacuation and rise-time testing of HVAC/R systems of all sizes.

Features

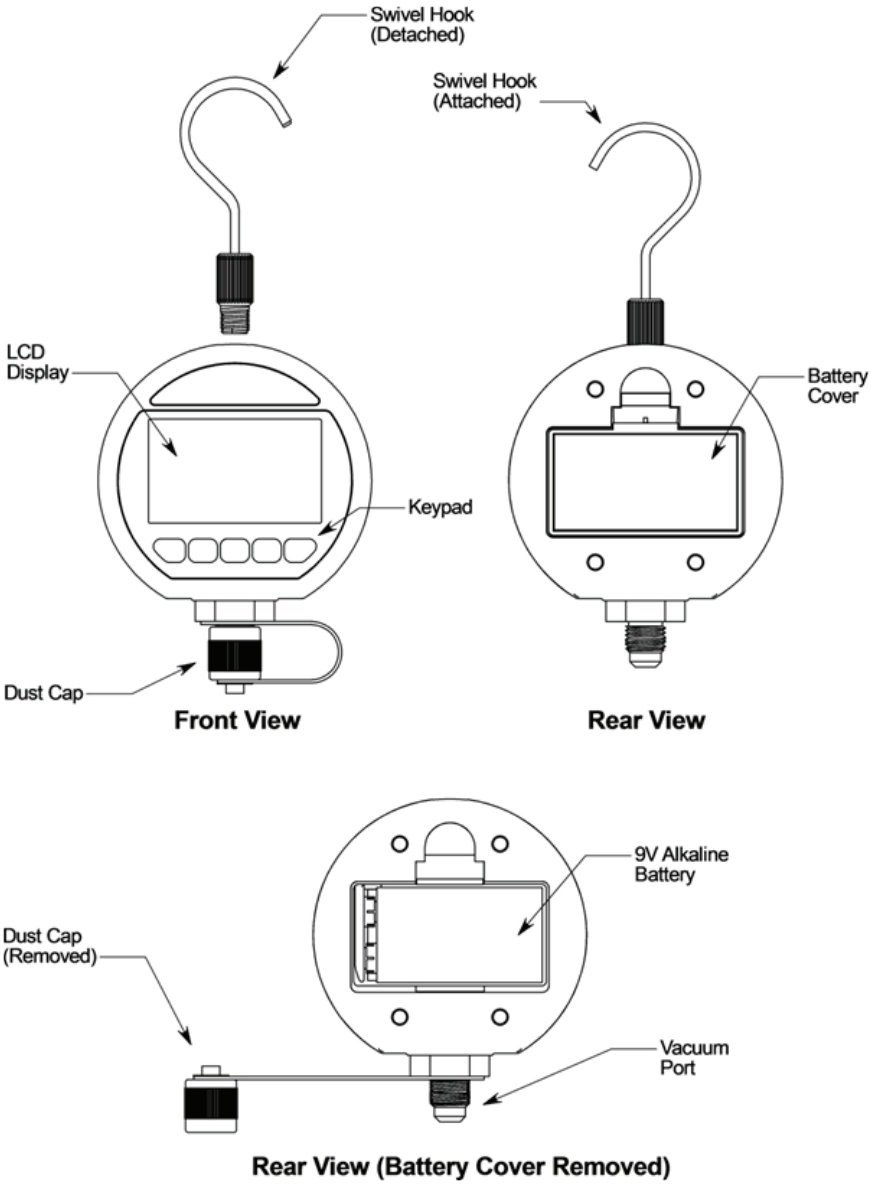
- Large, high-visibility back-lit LCD display
- Measures Vacuum in Microns, Pascals, Millibar, Millitorr, mmHg, PSI, and inHg
- 0 to 25,000 Micron range with 0.1 micron resolution less than 10,000 microns
- “Analog” vacuum level bar graph
- Evacuation progress indicator shows vacuum between 25,000 microns and ATM
- Vacuum leak rate, ambient temperature, and saturation temperature indicator
- Automatic oil sensor
- Measures ambient and saturation temperature in Fahrenheit and Celsius to 0.1˚
- Built-in memory retains all previous settings
- Rugged, compact design (protective silicone rubber boot available)
- Long battery life
- Programmable automatic evacuation and rise-time testing
- Calibration Self Test -- can be field calibrated with no special equipment
- Ideal for HVAC/R service, industrial use, and scientific measurement

Specifications

Range:	0 – 25,000 Microns (3333.1 Pa, 33.331 mBar, 25,000 mTorr, 25.000 mmHg, 0.4 8341 PSI, -28.037 inHg)
Vacuum Accuracy:	5% of Reading +/- 5 Microns
Vacuum Resolution:	0.1 Micron (@ 0.0 to 9999.9 Microns)
Temperature Accuracy:	0.2˚F (0.1˚C)
Temperature Resolution:	0.1˚
Warm-up Time:	Instant
Response Time:	Instant
Power:	9V Alkaline Battery (9V Lithium recommended for low temperature operation)
Battery Life:	Up to 300 Hours
Operating Temperature:	10˚F – 122˚F (-12˚C – 50˚C)
Vacuum Port Fitting:	¼” Male Flare – nickel plated for durability with dust cap
Maximum Overpressure	500 PSI
Weight:	6 oz. (170g) including battery and swivel hook
Dimensions:	3.5” x 3” x 1.25” (9cm x 7.5cm x 3cm)

WARNING: To avoid personal injury and to prevent damage to the eVac Pro, never exceed 500 PSI.

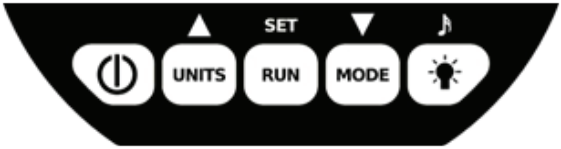
Parts Diagram



LCD Display

Item	Function
A	Main Numeric Display
B	Alternate Numeric Display
C	“Analog” Vacuum Level Bar Graph and Evacuation Progress Indicator
	Backlight Indicator. Flashing: Temporary, Solid: Always On
	Sound Indicator
	Battery Level Indicator
SET	Set Mode Indicator
RUN	Indicates Programmed Evacuation or Rise Time Analysis in Progress
DONE	Indicates Programmed Evacuation or Rise Time Analysis is Complete
OIL	Oil Sensor Indicator
CAL	Calibration Mode Indicator
TIME	Indicates that Evacuation Time is Displayed on the Alternate Numeric Display
RISE TIME	Indicates that Rise Time is Displayed on the Alternate Numeric Display
TEMP	Indicates that Ambient Temperature is Displayed on the Alternate Numeric Display
SAT. TEMP	Indicates that Saturation Temperature is Displayed on the Alternate Numeric Display
LEAK RATE	Indicates that the Vacuum Leak Rate is Displayed on the Alternate Numeric Display
°C	Indicates either Celsius or Fahrenheit Degrees are Displayed
/s /min	Indicates that the Vacuum Leak Rate is Displayed in UNITS/second or UNITS/minute.
PSI	Pound per Square Inch Units Indicator
inHg	Inches of Mercury Units Indicator (Gauge Pressure Referenced to –29.921 inHg)
Pa	Pascal Units Indicator
mBar	Millibar Units Indicator
mmHg	Millimeters of Mercury Units Indicator
mTorr	Millitorr Units Indicator
Microns	Micron Units Indicator

Keypad



Item	Function
⏻	*Press to Turn Power On.* *Press and Hold to Turn Power Off.* *While power is off, Press and Hold for Calibration Test.*
UNITS	*Press and Release to Change Display Units.* *Press and Hold to Change Temperature Display Units (°F or °C).*
RUN	*Press and Release to Start RUN Mode (Evacuation or Rise Time Analysis).* *Press and Hold to Cancel RUN Mode .*
MODE	*Press to Switch Between Ambient Temperature, Leak Rate, and Saturation Temperature on Alternate Display.* *Upon Initiating RUN Mode, Press to switch between Evacuation and Rise Time Analysis.*
☀	*Press and Release to Activate Backlight.*
▲ ▼	*Press or Press and Hold to Change Programmed Pressure or Time in SET Mode.*
SET	*Press and Hold to Enter SET Mode.* *Press and Release to Switch to Next Setting.* *Press and Hold to Exit SET Mode.*
♪	*Press and Hold to Mute/Un-mute Sound.*

Quick Start

To operate the eVac Pro as a basic vacuum gauge:

1. Install the battery as described in the “Battery Installation” section below.
2. Turn the power on by pressing ⏻. The display will show HI-P to indicate pressure greater than 25,000 Microns.
3. Select the desired units by repeatedly pressing UNITS .
4. Attach the eVac Pro to the system to be evacuated with a high quality vacuum hose or brass coupler. Start the vacuum pump. Read the vacuum level from the Main Display.
5. Turn the power off by pressing and holding ⏻.

WARNING: To avoid damaging the eVac Pro, only hand-tighten the sensor connection. If greater torque is required, support the sensor body with a ¾” wrench. Do not use gauge body for leverage.

NOTE: To assist in the use of this gauge and the interpretation of vacuum information, please refer to the Frequently Asked Questions Section at the end of this guide.

Battery Installation and Replacement

1. If installed, remove the protective boot.
2. Remove the battery cover from the rear of the eVac Pro by compressing tab at the base of the battery cover.
3. If necessary, remove and detach old battery from battery clip.
4. Attach battery clip to new battery and insert into battery compartment. Replace battery cover by aligning tab and snapping back into place.
5. Reinstall the protective boot.

IMPORTANT: TO PREVENT DAMAGE FROM LEAKING BATTERIES, DO NOT LEAVE A DEAD BATTERY INSIDE THE eVac Pro. REMOVE BATTERY IF THE eVac Pro IS NOT TO BE USED FOR AN EXTENDED PERIOD OF TIME.

Battery Level Indicator

The battery level indicator shows the relative strength of the battery. Four bars indicate full power. As the battery is depleted, the number of bars displayed decreases, until no bars are left. At this point, the battery must be replaced (refer to the **Battery Installation** section above). If the battery power drops to the point where the eVac Pro can no longer function accurately, the alarm will beep 10 times and the power will turn off automatically. When the battery is replaced, and the eVac Pro is turned back on, the eVac Pro will resume operation with all previous setting intact.

Units

Change the displayed units by pressing and releasing the UNITS key on the keypad. The appropriate units indicator on the LCD display will cycle through **PSI, inHg, Pa, mBar, mTorr, mmHg, or Microns** with each press. The units cannot be changed in the *Set Mode* or the *Run Mode* (see corresponding sections below).

Hi-Pressure Indication

If the sensed vacuum pressure exceeds 25,000 Microns (0.48342 PSI, -28.937 inHg, 3333.1 Pa, 33.331 mBar, 25,000 mTorr, or 25.000 mmHg), the display will show HI-P.

Sleep Mode

Unlike other digital vacuum gauges, the eVac Pro helps to conserve battery life through advanced power management. After 5 minutes of displaying HI-P, the eVac Pro will enter *Sleep Mode* in which the sensor and backlight are turned off, thus reducing the load on the battery and extending the battery life up to 300 hours or more. While in this mode, the display will show SLEEP. Approximately every 35 seconds, the gauge will automatically check the pressure and exit *Sleep Mode* if the pressure is less than 25,000 Microns. The gauge can be manually brought out of *Sleep Mode* by pressing any key on the keypad. While in *Sleep*, the gauge will beep twice every 5 minutes to remind you that it is on. The eVac Pro will not sleep in the *Set Mode* or the *Calibration Mode* (see the corresponding sections below).

Auto Power-Off

After 1 hour in “Sleep Mode” the eVac Pro will automatically turn itself off to further conserve battery power. The eVac Pro will not auto power-off if an Evacuation or Rise Time Test program is running.

Oil Sensor

It is necessary to prevent oil from being drawn into the vacuum sensor. For HVAC/R service, always recover refrigerant prior to attaching the gauge. If possible, always close the blank-off valve on the vacuum pump prior to turning the vacuum pump off. Over time, oil vapor and other materials may contaminate the sensor. The eVac Pro has a built in oil sensor that will detect this condition. If the **OIL** indicator on the display illuminates, this is an indication that the vacuum sensor has been contaminated and is no longer functioning accurately. If the sensor becomes completely saturated with oil to the extent that it cannot function properly at all, the message **OIL** will show on the display. Prior to further use of the eVac Pro, clean the sensor as describe in the "**Cleaning the Vacuum Sensor**" section below.

Backlight

To activate the backlight temporarily, press once. The indicator on the display will flash, and the backlight will turn off automatically after 1 minute. To activate the backlight permanently, press again. The indicator on the display will show solid. Turn off the backlight by pressing repeatedly until the indicator turns off. During *Sleep Mode*, the backlight will turn off to help conserve battery power, but will turn on again automatically upon resumption of normal operation if it was previously set in the permanent-on mode.

Sound

The eVac Pro has an internal speaker that will emit a beep for each valid key press, and also functions as an alarm in the *Programming and Calibration modes* (see corresponding sections below). It will also beep every 5 minutes in *Sleep Mode*. For silent operation, pressing and holding the ♪ key will mute the sound. The alarm is not affected by the mute status. The ♪ indicator on the LCD display indicates that the sound is on (not muted).

Range and Resolution

The eVac Pro has a broad vacuum pressure measurement range, and the highest resolution of any gauge. The display range and resolution depends upon the units displayed and the vacuum pressure reading, according to the table below:

Units	Vacuum Range	Vacuum Pressure Reading	Resolution
PSI	0 — 0.48342	0 – 0.48342	0.00001 PSI
inHg*	-29.921 — -28.937	-29.921 — -28.937	0.001 inHg
Pa	0 — 3,333.1	1,000.0 — 3,333.1	0.1 Pa
		0 — 999.99	0.01 Pa
mBar	0 — 33.331	10.000 — 33.331	0.001 mBar
		0 — 9.9999	0.0001 mBar
mTorr	0 — 25,000	10,000 — 25,000	1 mTorr
		0 — 9,999.9	0.1 mTorr
mmHg	0 — 25.000	10.000 — 25.000	0.001 mmHg
		0 — 9.9999	0.0001 mmHg
Microns	0 — 25,000	10,000 — 25,000	1 Micron
		0 — 9,999.9	0.1 Micron

*NOTE: inHg is displayed as Gauge Pressure, referenced to a Standard Atmosphere (-29.921 inHg).

“Analog” Vacuum Level Bar Graph

The Vacuum Level Bar Graph has two modes:

Evacuation Progress Indicator

When the pressure is above 25,000 microns (when the display shows HI-P), the bar graph indicates evacuation progress. The bars progressively drop as the pressure drops between ATM and 25,000 microns.

Vacuum Level Indicator

Below 25,000 microns, the bar graph allows for a quick visual determination of the vacuum level achieved. Each bar corresponds to a vacuum pressure range depending on units according to the following table:

	Units					
Bar Value	**Microns**	**Pa**	**Millibar**	**Millitorr**	**mmHg**	**PSI**
10K	10,000 — 25,000	1,000 — 3,333.1	10 — 33.331	10,000 — 25,000	10 — 25	0.2 — 0.48342
5K	5,000 — 10,000	500 — 1,000	5 — 10	5,000 — 10,000	5 — 10	0.1 — 0.2
2K	2,000 — 5,000	200 — 500	2 — 5	2,000 — 5,000	2 — 5	0.04 – 0.1
1K	1,000 — 2,000	100 — 200	1 — 2	1,000 — 2,000	1 — 2	0.02 — 0.04
500	500 — 1,000	50 — 100	0.5 — 1	500 — 1,000	0.5 — 1	0.01 — 0.02
200	200 — 500	20 — 50	0.2 — 0.5	200 — 500	0.2 — 0.5	0.004 — 0.01
100	100 — 200	10 — 20	0.1 — 0.2	100 — 200	0.1 — 0.2	0.002 — 0.004
50	50 — 100	5 — 10	0.05 — 0.1	50 — 100	0.05 — 0.1	0.001 — 0.002
20	20 — 50	2 — 5	0.02 — 0.05	20 — 50	0.02 — 0.05	0.0004 — 0.001
10	10 — 20	1 — 2	0.01 — 0.02	10 — 20	0.01 — 0.02	0.0002 — 0.0004

NOTE: The pressure bars indicate Microns when inHg units are selected.

Alternate Numeric Display

The eVac Pro has an Alternate Numeric Display that can indicate Vacuum Leak Rate, Ambient Temperature, Saturation Temperature, or Programming Time/Progress. Please refer to the “Programming” section below for programming instructions. During normal operation, the Alternate Numeric Display may show Vacuum Leak Rate, Ambient Temperature, or Saturation. Select the display mode by pressing the MODE key to cycle between **LEAK RATE**, **TEMP** and **SAT. TEMP**.

Vacuum Leak Rate Indicator

The Vacuum Leak Rate Indicator displays the rate of change of vacuum per second or per minute in the selected units when the **LEAK RATE** indicator is illuminated. The reading is positive for increasing pressure and negative for decreasing pressure. The **LEAK RATE** Indicator is useful for determining the size of a vacuum leak, if one exists, or the presence of moisture or outgassing. Under high-pressure conditions (HI-P), the leak rate indicator shows - - - - .

Press and hold the UNITS key while the **LEAK RATE** indicator is showing to switch between per second and per minute, as indicated by /s and /min on the display.

Ambient Temperature Indicator

Internally, the eVac Pro uses a very high accuracy temperature sensor to maintain proper calibration throughout the entire operating temperature range. This temperature is shown on the Alternate Numeric Display when the **TEMP** indicator is illuminated. The accuracy of the temperature sensor is 0.2˚F or 0.1˚C.

Saturation Temperature Indicator

The saturation temperature of water (i.e. the temperature at which water boils at the measured pressure) is computed and displayed on the Alternate Numeric Display when the **SAT. TEMP** indicator is illuminated. Under high-pressure conditions (HI-P), is shown on the Alternate Numeric Display.

Press and hold the UNITS key while the **TEMP** or **SAT. TEMP** indicator is showing to switch between Celsius and Fahrenheit, as indicated by ˚**C** and ˚**F** on the display.

Protective Boot Accessory

The protective boot accessory provides additional protection for the eVac Pro. The eVac Pro may be operated with or without the boot installed. For moisture protection, the boot is provided with a sealed cap where the swivel hook would normally be attached. To attach the hook with the boot in place, carefully cut the cap from the boot with a sharp blade.

Swivel Hook

The eVac Pro's removable stainless steel swivel hook enables hanging of the gauge and will allow it to swivel freely in any direction. The gauge may be operated with or without the hook attached. When fastening the hook to the gauge, turn it finger tight only. Use of a tool to tighten the hook may result in damage to the eVac Pro case.

Programming

As a special feature, the eVac Pro includes two related programs: the Evacuation Program and the Rise Time Testing (RTT) Program.

The Evacuation Program allows for unattended evacuation of large systems, and will sound an audible/visual alarm when the evacuation procedure is complete, based upon both an Evacuation Target Pressure and Evacuation Target Time. For example, a procedure may call for evacuating a system to at least 500 microns, and maintaining that pressure (or less) for at least 15 minutes.

Following a successful evacuation, the RTT Program can consistently ensure proper evacuation by analyzing the rate-of-rise of pressure vs. time, and automatically signal a PASS or FAIL indication based upon an RTT Target Pressure and RTT Target Time. Advantageously, a clean, dry, and tight system can successfully PASS a Rise Time Test in as little as 15 seconds, eliminating the need to wait for the RTT Target Time to elapse. For example, a procedure may call for ensuring that a system evacuated to 500 microns or less will not exceed 1000 microns after the vacuum pump has been blanked off over 10 minutes.

Each program consists of both a target pressure (vacuum level) and a time period. There are 16 possible target pressures, depending upon the units displayed, as shown in the following table:

Units						
Microns	**Pascal**	**Millibar**	**Millitorr**	**mmHg**	**PSI**	**inHg**
50	5.0	0.050	50	0.050	0.0010	-29.919
75	10.0	0.100	75	0.075	0.0015	-29.918
100	15.0	0.150	100	0.100	0.0020	-29.917
150	20.0	0.200	150	0.150	0.0030	-29.915
200	30.0	0.300	200	0.200	0.0050	-29.913
300	50.0	0.500	300	0.300	0.0075	-29.910
500	75.0	0.750	500	0.500	0.0100	-29.900
750	100.0	1.000	750	0.750	0.0150	-29.890
1000	150.0	1.500	1000	1.000	0.0200	-29.880
1500	200.0	2.000	1500	1.500	0.0300	-29.060
2000	300.0	3.000	2000	2.000	0.0500	-29.850
3000	500.0	5.000	3000	3.000	0.0750	-29.800
5000	750.0	7.500	5000	5.000	0.1000	-29.700
7500	1000.0	10.000	7500	7.500	0.1500	-29.600
10000	1500.0	15.000	10000	10.000	0.2000	-29.500
15000	2000.0	20.000	15000	15.000	0.3000	-29.300

The time periods may be programmed between 0 seconds and 100 minutes. To program the eVac Pro, the Set Mode must be activated:

Programming (Set Mode)

1. Turn the power on by pressing ⏻.
2. Select the desired units by repeatedly pressing UNITS.
3. Activate the Program Set Mode by pressing and holding **SET**. The **SET** and **TIME** indicators will show on the display, as well as the currently programmed Evacuation Target Pressure and Time.
4. While the pressure display is flashing, press and/or hold the ▲ or ▼ keys to increase or decrease the Evacuation Target Pressure. When compete, press and release the **SET** key.
5. While the minutes display is flashing, press and/or hold the ▲ or ▼ keys to increase or decrease the Evacuation Target Time minutes. When compete, press and release the **SET** key.
6. While the seconds display is flashing, press and/or hold the ▲ or ▼ keys to increase or decrease the Evacuation Target Time seconds. When compete, press and release the **SET** key.

7. The display will now show the currently programmed RTT Target Pressure and Time, and the RISE TIME indicator will illuminate.
8. While the pressure display is flashing, press and/or hold the ▲ or ▼ keys to increase or decrease the RTT Target Pressure. When compete, press and release the **SET** key.
9. While the minutes display is flashing, press and/or hold the ▲ or ▼ keys to increase or decrease the RTT Target Time minutes. When compete, press and release the **SET** key.
10. While the seconds display is flashing, press and/or hold the ▲ or ▼ keys to increase or decrease the RTT Target Time seconds. When compete, press and release the **SET** key.
11. The gauge will beep three times (if sound is enabled), and return to normal mode. The new program is now saved.
12. At any point in the Program Set Mode, pressing and holding the **SET** key will result in saving the current program and returning to normal mode.
13. Once programmed, the eVac Pro will remember the settings until changed again, even if the power is turned off or the battery removed.

NOTE: The units cannot be changed while in the Set Mode.

Executing a Program (Run Mode)

Press and release RUN. The **RUN** indicator will illuminate and EVAC (EVAC) or rISE (RISE), indicating the current program execution mode, will flash on the main display. Press the MODE key to select the desired execution mode. The main display will toggle between EVAC and rISE with each press of the key.

Executing the Evacution Program

1. Ensure EVAC is flashing on the display. Use the MODE to select EVAC as above, if not.
2. Press RUN to start the program.
3. The **RUN** and **TIME** indicators will illuminate on the display. **RUN** will flash to indicate the program is running.
4. Start the vacuum pump.
5. When the vacuum pressure drops to less than the target evacuation pressure, the timer will start. Subsequently, if the pressure exceeds the target evacuation pressure, the timer will stop and resume counting when the pressure again drops to less than the target pressure.
6. When the timer expires, the eVac Pro will sound an alarm, flash the backlight, and blink the DONE indicator. Press any key to silence the alarm. The program is complete.
7. Blank-off and stop the vacuum pump.

Executing the Rise Time Test Program

1. Ensure the vacuum pump is blanked-off and stopped.
2. Ensure rISE is flashing on the display. Use the MODE to select rISE as above, if not.
3. Press RUN to start the program.
4. The **RUN** and **RISE TIME** indicators will illuminate on the display. **RUN** will flash to indicate the program is running.
5. Immediately, the eVac Pro will begin monitoring the rise rate of pressure, though the clock will remain stopped until the pressure exceeds the Evacuation Target Pressure.
6. If a determination is made that the pressure will not exceed the Rise Time Pressure Target within the allotted time, the eVac will alarm and indicate PASS regardless of the time remaining. The analysis is performed, and a PASS can be achieved, even if the clock is not running (i.e. system is still below the Evacuation Target Pressure).

7. If the pressure exceeds the RTT Target Pressure before the RTT Target Time is achieved, the eVac Pro will alarm and show FAIL to indicate that the test has failed.
8. In either case, pressing any key will silence the alarm. In the case of a PASS , the clock will continue counting for further manual analysis. This can be stopped by pressing the RUN key. In the case of a FAIL, normal operation will immediately resume.

While in the Run Mode, the gauge may sleep after 5 minutes of high pressure. The gauge will wake and continue the program normally once the pressure drops below 25,000 Microns. The gauge may be manually wakened from sleep by pressing any key. In the Run Mode, the Auto Power-Off feature is disabled.

Stopping a Program

At any time during the Run Mode, the program can be canceled by pressing and holding RUN .

NOTE: The units cannot be changed while in the Run Mode. Pressing the Mode key during the run mode will toggle between leak rate and time.

Maintenance

The eVac Pro should provide many years of service with no maintenance required. When not in use, the dust cap should remain in place over the sensor port. Clean the plastic enclosure with a damp (not wet) rag. Mild detergent is acceptable, but use no solvents. Take care not to expose the vacuum sensor to oil. If the Oil Sensor (described above) indicates a contaminated sensor, follow the Sensor Cleaning Procedure below.

Cleaning the Vacuum Sensor

If the vacuum sensor becomes contaminated with oil (as indicated by the Oil Sensor), carefully follow this procedure:

1. Power off the eVac Pro.
2. Shake the gauge to remove any large quantities of oil from the sensor.
3. Using an eyedropper or syringe, carefully apply a few drops of rubbing alcohol inside the sensor vacuum port. **DO NOT INSERT ANY OBJECT INTO THE PORT, AS THIS WILL PERMANENTLY DAMAGE THE SENSOR.**
4. Place your finger over the port and shake for a few seconds.
5. Remove your finger and shake out the alcohol.
6. Repeat steps (3) – (5) at least three times.
7. Allow the sensor to air dry over at least an hour, or pull a vacuum on the sensor to dry it more quickly (a few seconds).
8. Replace the battery and turn on the gauge. The -OIL- message and **OIL** indicator should be off. If it is still on, repeat the cleaning procedure.
9. If, after repeated cleaning, the -OIL- message or the **OIL** indicator is still illuminated, or, if full accuracy is desired, perform a calibration cycle as detailed in the Calibration section below.

NOTE: It is important to remove all alcohol vapors from the sensor, either through air-drying or via vacuum. Any remaining vapors will cause an incorrect vacuum reading.

Calibration Test

The eVac Pro should rarely require recalibration, though it may be necessary to know that your gauge is calibrated properly for full accuracy. The Calibration Test mode assures you that the eVac Pro is calibrated to factory specifications. Test the calibration as follows:

1. Power off the eVac Pro.
2. Important: Expose the eVac Pro to atmospheric pressure.
3. Press and hold (do not release) the ⏻ key for about 5 seconds.
4. The display will show CAL Good if the instrument is calibrated properly.
5. The display will show CAL Soon if the instrument requires calibration. Please see the Calibration section below.

Calibration

If the Calibration Test indicates recalibration is required, the gauge may be recalibrated. Unlike any other vacuum gauge, the eVac Pro can be easily recalibrated to factory specifications without any special equipment, with the following procedure:

1. For best results, clean the sensor with alcohol prior to calibration. Ensure the sensor is completely dry before proceeding.
2. Power off the eVac Pro. If necessary, install a fully charged battery into the gauge.
3. Place the dust cap over the vacuum fitting.
4. Hold RUN while pressing ⏻. As soon as the power turns on, release RUN and then press it quickly at least three times. The CAL indicator should illuminate, and should show on the Main Numeric Display. If not, turn the power off again and repeat.
5. Place the eVac Pro in a clear Ziploc (resealable zipper storage) bag, press out any extra air, and seal.
6. Place the bagged eVac Pro into a freezer with a temperature of less than –5˚C (23˚F).
7. Allow the eVac Pro to cool to below -2˚C (28.4˚F). At this point, the alarm will sound and the display will change to Hot.
8. Remove from freezer and press any key to silence the alarm.
9. Place the eVac Pro undisturbed in an area with a room temperature of at least 23˚C (73.4˚F) but no greater than 30˚C (86˚F).
10. Allow the eVac Pro to warm to 20˚C (68˚F). At this point, the alarm will sound, and HI-P will show on the display.
11. Press any key to silence the alarm. The eVac Pro is now calibrated to factory specifications.

Note: For accurate calibration, allow the eVac Pro to warm slowly. Attempting to accelerate the warming by using a heat source will not provide satisfactory results. During the cooling/warming process, the temperature will be indicated on the Alternate Numeric Display in degrees Celsius. The calibration process may be canceled at any time by turning off the eVac Pro or by pressing and holding RUN . The previous calibration will be unchanged.

Low Temperature Operation

The eVac Pro can operate accurately at temperatures as low as 10˚F (-12˚C). While operating below freezing (32˚F/0˚C), the display update rate will slow from 3.5 readings every second to one reading every two seconds.

For satisfactory battery life at low temperatures, a 9V Lithium battery is recommended.

Troubleshooting

Under certain conditions, the display may read -OIL- or Error. Please use the table below to determine and fix the problem:

Display	Mode	Possible Problem	Solution
-OIL-	Normal Operation or Run Mode	Sensor Contaminated	Clean the Vacuum Sensor
		Ambient Temperature too Low	Turn the eVac Pro off, warm the vacuum port with your hand, turn the eVac Pro back on.
	Calibration	Sensor Contaminated	Clean the Vacuum Sensor and Restart Calibration
Error	Normal Operation or Run Mode	Sensor Failure	Contact Customer Service
	Calibration	Gauged Warmed too Quickly	Restart Calibration. Allow the Gauge to Warm Slowly
		Gauge Disturbed During Calibration	Restart Calibration. Leave the Gauge Undisturbed During Warming Phase.

Frequently Asked Questions

Q. How often must I calibrate the eVac Pro? Calibration of the eVac Pro is only necessary when the Calibration Test indicates that calibration is required. Regardless, frequent cleaning and/or calibration will not adversely affect the long-term reliability of the instrument. For best results, ensure the sensor is clean and dry, and the dust cap is in place, prior to calibration.

Q. Can I use the eVac Pro to check the proper operation of my vacuum pump? Yes. Attach the eVac Pro directly to the pump with a short hose or coupler. Turn the pump on, open the blank-off valve, and close the ballast. A good pump with clean and dry oil will typically pull very quickly to less than 100 microns (generally around 25 microns for a two-stage pump). Always close the blank-off valve and/or disconnect the BluVac Pro prior to turning off the pump so as to avoid oil contamination of the sensor.

Q. The eVac Pro does not indicate acceptably low pressure when I test my pump. Ensure the pump oil is clean and dry (it should be completely clear when viewed through the pump's sight glass). Replace the oil. Ensure the pump ballast is completely closed and the blank-off valve is completely open, and all fittings are tight and seals are not damaged. If low pressure is still not achieved, the pump may be damaged or worn.

Q. I've attached the eVac Pro directly to my pump with a short hose or coupler. As soon as I blank off the pump, the indicated pressure rises rapidly. Is the eVac Pro's sensor leaking? No. There will always be molecular-sized leaks, outgassing, and/or permeation in any hose or fitting, and the pump's blank-off valve may not be entirely gas tight. The indicated pressure will rise due to the small internal volume of the hose or coupler.

Q. What is the recommended method for attaching the eVac Pro for evacuation service? Ideally, the eVac Pro should be as close to the internals of the system under evacuation, and as far from the vacuum pump as possible. Attaching the eVac Pro to the auxiliary port of a core removal tool (CRT) connected directly to a service port is the best method. The ball-valve of the CRT can be closed to completely isolate the system from the pump and hoses, thereby allowing for an accurate rise-time test at the completion of evacuation. Additionally, removing the Schrader core(s) via the CRT and using large diameter hoses will greatly speed the evacuation process.

Q. I accidentally exposed the eVac Pro to high-pressure refrigerant. Did I damage the eVac Pro? No. The eVac Pro's sensor is rated to 500 PSI overpressure, and can be directly exposed to gas/liquid refrigerant. At worst, the sensor may be exposed to oil, in which case the oil indicator will activate and cleaning/calibration may be required.

Q. I removed the eVac Pro from the system under vacuum, but the indicated pressure rises slowly and/or the gauge does not return to Hi-P. Is the eVac Pro damaged? No. The slow rise in pressure is due to residual refrigerant gas captured in the sensor. Gently blowing air into the sensor to remove the residual gas will effect an immediate rise to Hi-P.

Q. How do I use the leak rate indicator? The leak-rate indicator is especially useful for system diagnostics during a rise-time test. If the indicated leak rate is stable and constant, this usually indicates a physical vacuum leak. If the leak rate is stable, but decreases as the pressure rises, this usually indicates evaporating moisture or outgassing. If the leak rate is unstable (bouncing between different numbers), this usually indicates liquid water boiling off inside the system. Since the resolution of the eVac Pro is so high, it may be difficult to achieve a zero leak-rate. This is not a problem as long as the system meets the manufacturer's recommended vacuum rise-time performance.

Frequently Asked Questions

Q. Why does the ambient temperature indicator show a different temperature than my room thermometer? The ambient temperature indicator actually measures the temperature of the metal sensor housing and the gas contained within the sensor. This temperature may be a few degrees different than room temperature. The temperature sensor itself is inherently accurate within 0.2˚F (0.1˚C) and requires no calibration.

Q. My eVac Pro reads a different pressure than my other vacuum gauge from another manufacture. Which gauge is correct? Unlike all other micron gauges, the eVac Pro's accuracy is independent of temperature and pressure. Therefore, you can be confident that the eVac Pro's reading is correct. Other gauges are calibrated at a specific temperature and pressure (i.e. 500 microns and 77˚F (25˚C)). The accuracy of those gauges is necessarily underated when operated at pressures and temperatures different than the calibration values.

Q. I've started a Rise Time Test Program, but the clock doesn't run. Why? For consistency of rise time testing, the Rise Time Clock does not begin counting until the pressure has risen above the Evacuation Target Pressure. On a very clean, dry, and tight volume, this may not happen before a PASS result is achieved. Regardless, a PASS result ensures that the pressure would not have risen between the Evacuation Target Pressure and the Rise Time Target Pressure within the allowed Rise Time Target Time Period.

Q. I am still having problems using the eVac Pro and/or understanding the readings it is giving me. What should I do? Please, contact us! Use our website at www.yellowjacket.com or call us at (952) 943-1333 between 8:00AM and 5:00PM CST. We will be happy to help.

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