



EVac I™ Digital Vacuum Gauge



Operation and Maintenance Manual

INTRODUCTION

Thank you for your purchase of the **YELLOW JACKET® EVac I Digital Vacuum Gauge**. Utilizing patented technology, the **EVac I** is the most accurate vacuum gauge available.

With the **EVac I**, you can accurately measure vacuum pressure in Microns, Pascals, Millibar, Millitorr, and mmHg with a resolution of 1 micron. Ideal for the HVAC/R professional, the **EVac I** is small, lightweight, rugged and easy to use.

FEATURES

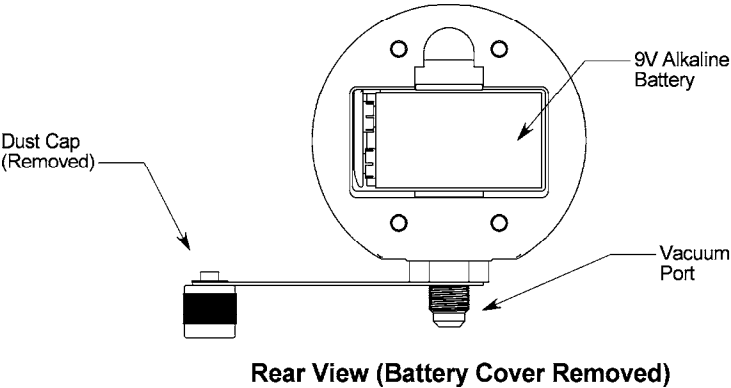
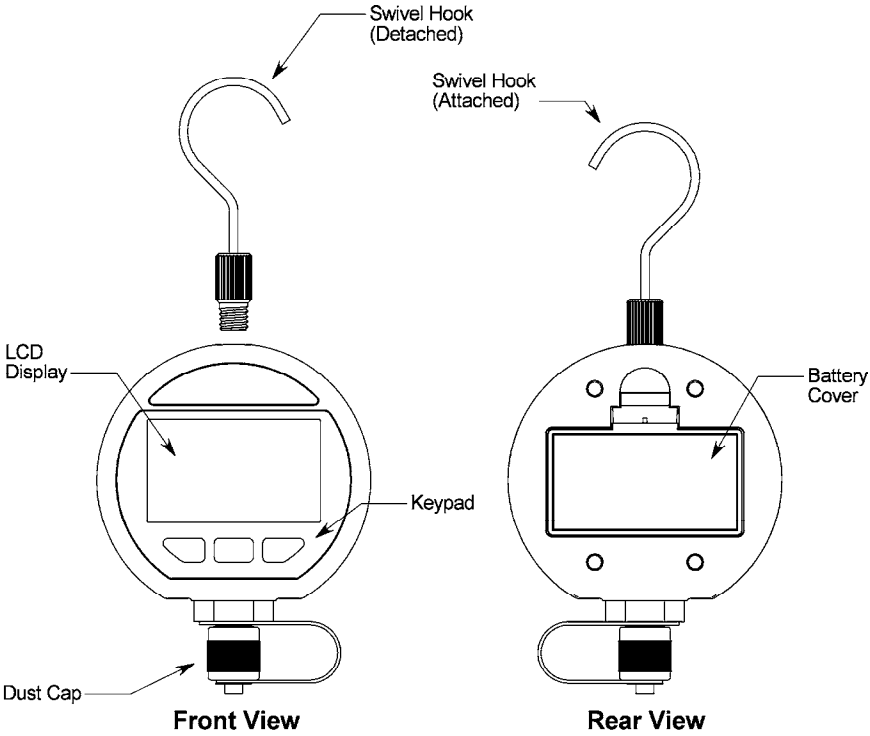
- Large, high-visibility back-lit LCD display
- Measures Vacuum in Microns, Pascals, Millibar, Millitorr and mmHg
- 0 to 25,000 Micron Range with 1 Micron Resolution
- “Analog” Vacuum Level Bar Graph
- Automatic Oil Sensor
- Built-in memory retains all previous settings
- Rugged, Compact Design – About the Size of a Manifold Gauge
- Long Battery Life
- Calibration Self Test -- Can be field calibrated with no special equipment
- Ideal for HVAC/R Service and Industrial Use

SPECIFICATIONS

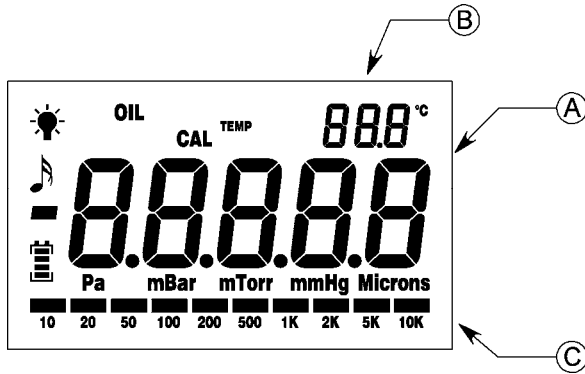
Range:	0 – 25,000 Microns (3333 Pa, 33.330 mBar, 25,000 mTorr, 25.000 mmHg)
Vacuum Accuracy:	5% of Reading +/- 5 Microns
Vacuum Resolution:	1 Micron (1 Pa, 0.001 mBar, 1 mTorr, 0.001 mmHg)
Warm-up Time:	Instant
Response Time:	Instant
Power:	9V Alkaline Battery (9V Lithium recommended for low temperature operation)
Battery Life:	Up to 300 Hours
Operating Temperature:	10°F – 122°F (-12°C – 50°C)
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 I Digital Vacuum Gauge, never exceed 500 PSI.

PARTS DIAGRAM







LCD DISPLAY



Item	Function
A	Main Numeric Display
B	Alternate Numeric Display
C	“Analog” Vacuum Level Bar Graph
	Backlight Indicator. Flashing: Temporary, Solid: Always On
	Sound Indicator
	Battery Level Indicator
OIL	Oil Sensor Indicator
CAL	Calibration Mode Indicator
TEMP	Indicates that Temperature is Displayed on the Alternate Numeric Display (during calibration)
°C	Indicates degrees Celsius on the Alternate Numeric Display (during calibration)
Pa	Pascal Units Indicator
mBar	Millibar Units Indicator
mTorr	Millitorr Units Indicator
mmHg	Millimeters of Mercury Units Indicator
Microns	Micron Units Indicator




KEYPAD



Item	Function
	Press to Turn Power On, Press and Hold to Turn Power Off
	Press to Change Display Units
	Press and Release to Activate Backlight
	Press and Hold to Mute/Un-mute Sound

QUICK START

To operate the *EVac I* 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 **H I - P** to indicate pressure greater than 25,000 Microns.
3. Select the desired units by repeatedly pressing .
4. Attach the *EVac I* to the system to be evacuated with a high quality vacuum hose. Start the vacuum pump. Read the vacuum level from the Main Display.
5. Turn the power off by pressing and holding .

BATTERY INSTALLATION & REPLACEMENT

1. Remove the battery cover from the rear of the *EVac I* by compressing tab at the base of the battery cover.
2. If necessary, remove and detach old battery from battery clip.
3. Attach battery clip to new battery and insert into battery compartment. Replace battery cover by aligning tab and snapping back into place.

IMPORTANT: TO PREVENT DAMAGE FROM LEAKING BATTERIES, DO NOT LEAVE A DEAD BATTERY INSIDE THE *EVac I*. REMOVE BATTERY IF THE *EVac I* 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, it is necessary to replace the batteries (refer to the Battery Installation section above) If the battery power drops to the point where the *EVac I* 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 I* is turned back on, the *EVac I* will resume operation with all previous settings intact.

HI-PRESSURE INDICATION

If the sensed vacuum pressure exceeds 25,000 Microns (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 I* helps to conserve battery life through advanced power management. After 5 minutes of displaying **HI-P**, the *EVac I* 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 I* will not sleep in the Calibration Mode (see the Calibration section below).

AUTO POWER-OFF


After 1 hour in "Sleep Mode" the *EVac I* will automatically turn itself off to further conserve battery power.

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 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 I* has a built in Oil Sensor that will detect this condition. If the **OIL** indicator in 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 I*, clean the sensor as described in the "Cleaning the Vacuum Sensor" section.

UNITS

Change the displayed units by pressing the  key on the keypad. The appropriate units indicator on the LCD display will show **Pa, mBar, mTorr, mmHg, or Microns** depending on the units set.

RANGE AND RESOLUTION

The *EVac I* has a broad vacuum pressure measurement range and very high resolution according to the table below:







	Vacuum Range	Resolution
Pascals (Pa)	0 — 3,333.1	0.1 Pa
Millibar (mBar)	0 — 33.331	0.001 mBar
Millitorr (mTorr)	0 — 25,000	1 mTorr
mmHg (mmHg)	0 — 25,000	0.001 mmHg
Microns (Microns)	0 — 25,000	1 Micron

“ANALOG” VACUUM LEVEL BAR GRAPH



The *EVac I* also displays a Vacuum Level Bar Graph allowing 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:

Bar Value	Units				
	Microns	Pa	Millibar	Millitorr	mmHg
10K	10,000 — ATM	1,000 — ATM	10 — ATM	10,000 — ATM	10 — ATM
5K	5,000 — 10,000	500 — 1,000	5 — 10	5,000 — 10,000	5 — 10
2K	2,000 — 5,000	200 — 500	2 — 5	2,000 — 5,000	2 — 5
1K	1,000 — 2,000	100 — 200	1 — 2	1,000 — 2,000	1 — 2
500	500 — 1,000	50 — 100	0.5 — 1	500 — 1,000	0.5 — 1
200	200 — 500	20 — 50	0.2 — 0.5	200 — 500	0.2 — 0.5
100	100 — 200	10 — 20	0.1 — 0.2	100 — 200	0.1 — 0.2
50	50 — 100	5 — 10	0.05 — 0.1	50 — 100	0.05 — 0.1
20	20 — 50	2 — 5	0.02 — 0.05	20 — 50	0.02 — 0.05
10	10 — 20	1 — 2	0.01 — 0.02	10 — 20	0.01 — 0.02

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

SWIVEL HOOK

The *EVac I*'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 I* case.

MAINTENANCE

The *EVac I* 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. Turn the *EVac I* power off.
2. Shake the gauge to remove any large quantities of oil from the sensor.
3. 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 moments.
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 clean it more quickly.
8. Replace the battery and turn on the gauge. The Oil Indicator should be off. If it is still on, repeat the cleaning procedure.
9. 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 I* 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 I* is calibrated to factory specifications. Test the calibration as follows:

1. Turn the *EVac I* power off.
2. **Important:** Expose the *EVac I* 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 I* 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. Turn the *EVac I* power off. If necessary, install a fully charged battery into the gauge.
3. Place the dust cap over the vacuum fitting.
4. Hold  while pressing . As soon as the power turns on, release  and  and then press  quickly at least three times. The  indicator should illuminate, and **CoId** should show on the Main Numeric Display. If not, turn the power off again and repeat.
5. Place the *EVac I* in a clear Ziploc (resealable zipper storage) bag, press out any extra air, and seal.
6. Place the bagged *EVac I* into a freezer with a temperature of less than -5°C (23°F).
7. Allow the *EVac I* 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 I* 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 I* to warm to 20°C (68°F). At this point, the alarm will sound, and **H I-P** will show on the display.
11. Press any key to silence the alarm. The *EVac I* is now calibrated to factory specifications.

Note: For accurate calibration, it is necessary to allow the *EVac I* 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 I*. The previous calibration will be unchanged.

RESTORING FACTORY CALIBRATION

The original factory calibration can be restored at any time by the following procedure:

1. Turn the *EVac I* power off.
2. Hold **UNITS** while pressing **⏻**. As soon as the power turns on, release **UNITS** and **⏻** and then press **UNITS** quickly at least three times. The **Co Id** indicator should illuminate, and **Co Id** should show on the Main Numeric Display. If not, turn the power off again and repeat.
3. Press **UNITS** five times followed by **⏻**.
4. The gauge will beep 5 times and return to normal operation. The *EVac I* is now reset to the original factory calibration.

TROUBLESHOOTING

Under certain conditions, the display may read **-0 IL-** or **Error**. Please use the table below to determine and fix the problem:

Display	Mode	Possible Problem	Solution
-0 IL-	Normal Operation	Sensor Contaminated	Clean the Vacuum Sensor
		Ambient Temperature too Low	Turn the eVac I off, warm the vacuum port with your hand, and turn the eVac I back on.
	Calibration	Sensor Contaminated	Clean the Vacuum Sensor and Restart Calibration
Error	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.

LOW TEMPERATURE OPERATION

The *EVac I* 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.

A standard alkaline battery may not provide acceptable battery life at temperatures below 0°C (32°F). For low temperature operation, a 9V Lithium battery is recommended.

NOTES



Ritchie Engineering Co., Inc.
YELLOW JACKET Products Division
10950 Hampshire Ave., S.
Bloomington, MN 55438-2623 USA
e-mail: custserv@yellowjacket.com
Web Site: www.yellowjacket.com

Phone: 800-769-8370
Int'l Phone: 952-943-1333
Fax: 800-322-8684
Int'l Fax: 952-943-1605