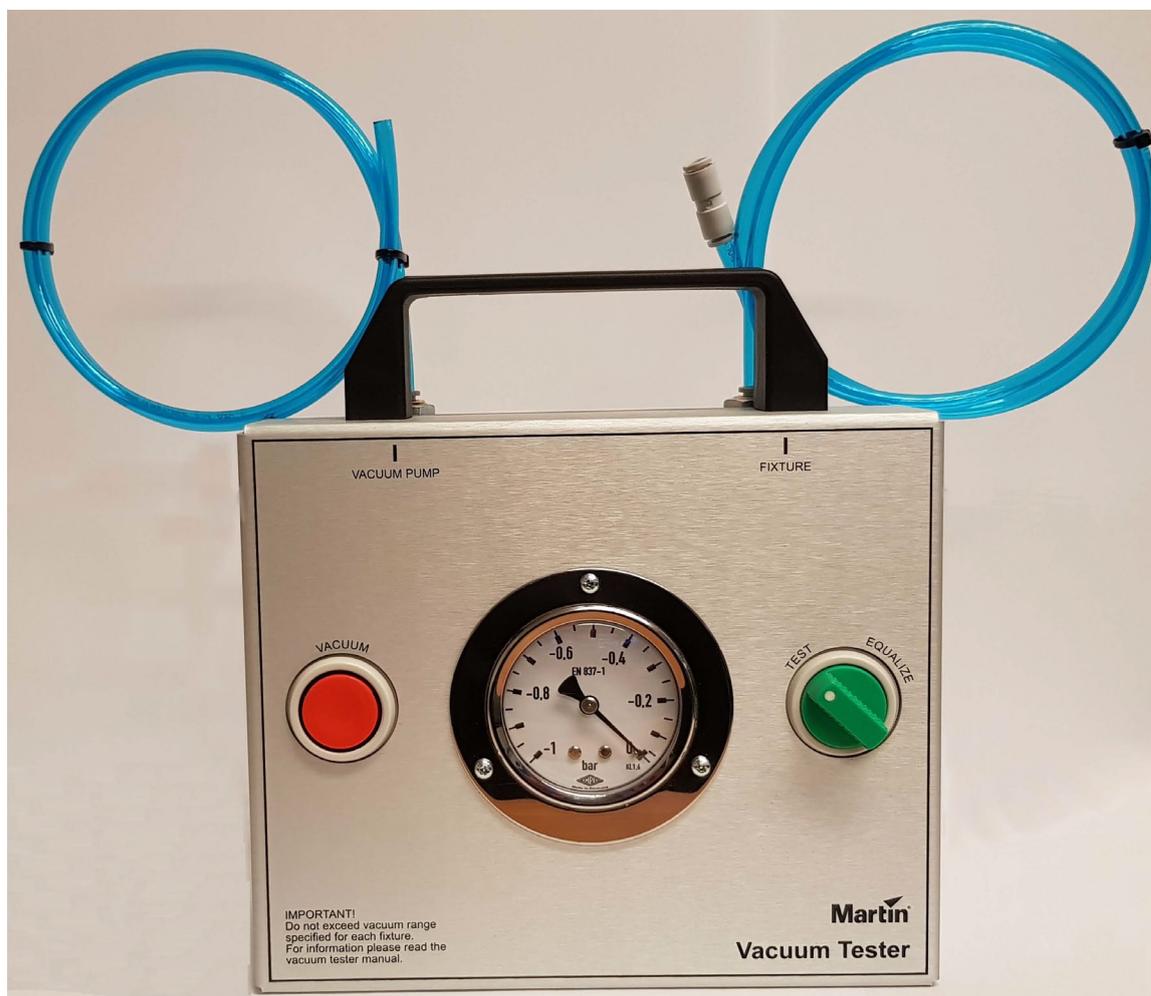




# TECH NOTE

## Exterior products

Performing a vacuum test, revision H, 02-09-2020



# How to vacuum test

This document concerns the products mentioned in figure 8.

These products are sealed to prevent entry of moisture. A pressure relief valve (1) with a Gore-Tex membrane on the product allows internal and external pressure to be equalized without allowing water to enter the product. The valve will gradually purge moisture from the product.

The vacuum tester also contains a pressure relief valve that purges any water droplets from the air that enters the product after completion of a test.

Make sure to install the product's covers, silicone seals and cable glands correctly after service to avoid moisture from being sucked into the product as it will affect the performance and product life.

The vacuum tester from Martin™ by Harman allows you to check whether the product is correctly sealed. Use the vacuum tester together with a vacuum pump. The pump is not supplied. For more information about the vacuum pump, see “Specifications for vacuum pumps” on page 7.

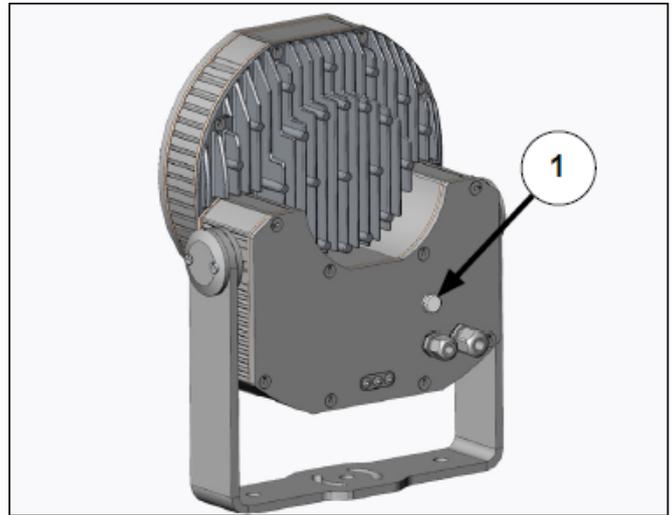


Figure 1: Pressure relief valve on Exterior 400

## Product overview

- **91611580 - Vacuum tester**

1. Vacuum hose for connection to vacuum pump.
2. Vacuum hose for connection to product.
3. Suction cup.
4. Test/equalize button.
5. Manometer. Gives vacuum level readout.
6. Vacuum activation button.

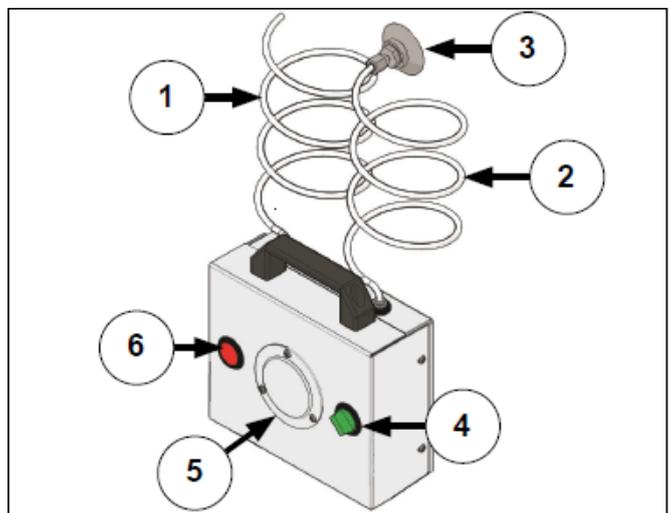


Figure 2: Vacuum tester

## Pump adaptor

Two pump adaptors with O-ring seals (1 and 2) and a suction cup (3) are supplied with the vacuum tester. The two pump adaptors have different thread pitches:

1. M12x1, very fine (P/N 50503001)
2. M12x1.5, fine (P/N 50503002)

In the table below, you can see which pump adaptor to use with which product:

| M12x1                | M12x1.5                   |
|----------------------|---------------------------|
| Exterior 400 Series  | Exterior 400 IP           |
| Exterior 600 Series  | Exterior Inground 400 LED |
| Exterior 1200 Series | Exterior Inground 200     |
|                      | Exterior Wash 100 Series  |
|                      | Exterior Wash 200 Series  |
|                      | Exterior Wash 300 Series  |
|                      | Exterior Linear Series    |
|                      | Exterior Projection 500   |
|                      | Exterior Projection 1000  |
|                      | Exterior 200 Series       |
|                      | Extube 300                |
|                      | Extube 1200               |
|                      | LC+                       |
|                      | Tripix 300                |
|                      | Tripix 1200               |
|                      | ERA 500                   |
|                      | ELP IP                    |

Make sure that you use the correct pump adaptor for the product which you are testing. Otherwise, the thread on the product will be damaged.

**NOTE!** Only tighten the pump adaptors with your fingers. Do not use any tools to tighten the pump adaptors.

The suction cup is to be used with products that do not have a M12 thread. The suction cup is also to be used during pressure tests.

## Test setup

Before you carry out the test, make sure that you have a suitable vacuum pump (1) with a fitting that fits a 6 mm outer diameter vacuum hose at your disposal. See “Specifications for vacuum pumps” on page 7.

For maximum mobility, use a battery-driven pump.

1. The vacuum tester (2) is supplied with two vacuum hoses (4 and 5) with an external diameter of 6 mm that match the fittings on the vacuum tester (2) and the suction cup (3).
2. Connect the hose (4) to the fitting on the top of the vacuum tester (2) on the left-hand side and then to the vacuum pump (1).
3. Connect the hose (5) to the fitting on the top of the tester on the right-hand side and then to the suction cup (3) which was supplied with the vacuum tester.

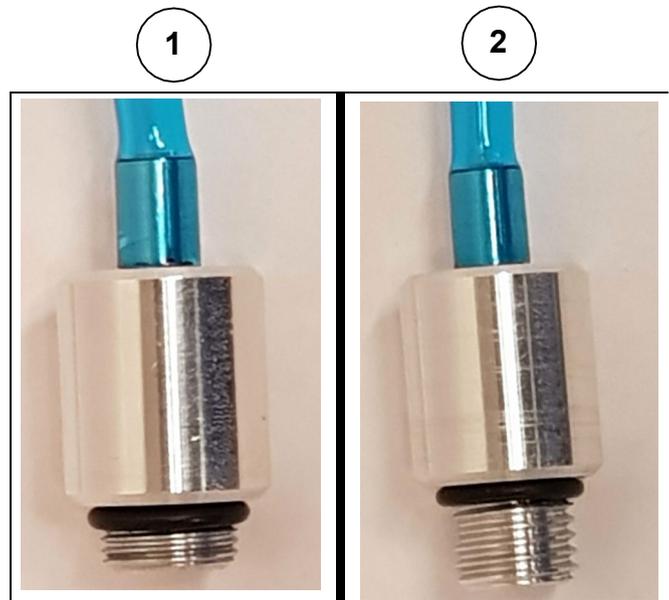


Figure 3: Pump adaptors



Figure 4: Suction cup

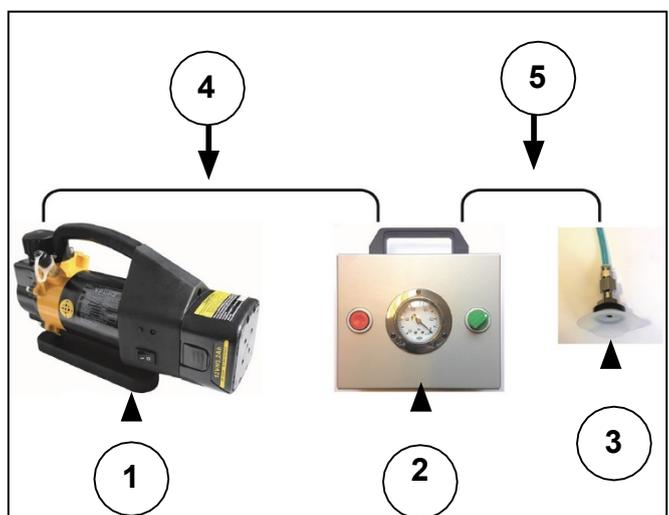


Figure 5: Test setup

## Performing a pressure test

Before you use the vacuum tester on a product, perform a pressure test to make sure that there are no leaks that might cause false readings.

1. Push the fitting on the end of the hose (1) on to the suction cup tube (2).
2. Turn the green test/equalize button (3) to the TEST position.
3. Start the vacuum pump (4).
4. With one hand, press the suction cup (2) onto a clean sheet of glass (the front glass of a product may be suitable) or another perfectly smooth and hard surface.
5. With the other hand, press the red vacuum activation button (5) and hold it down until the needle on the manometer (6) gives a readout of approximately -0.8 bar.
6. Release the red vacuum button.

If you have reduced the pressure too much

7. Turn the green test/equalize button (3) briefly to EQUALIZE to allow air into the system. Then turn the valve back to TEST.
8. Press the red vacuum activation button (5) again until you obtain approximately -0.8 bar.
9. Release the red vacuum activation button (5).

Continue the test

10. Watch the needle on the manometer (6) carefully and wait for approximately 30 seconds.  
If the needle moves, there is a leak in the system. Check all connections and carry out the pressure test again.  
If the needle has not moved after 30 seconds, the system has passed the pressure test and you can continue as mentioned below.
11. Turn off the vacuum pump (4).
12. Turn the test/equalize button to the equalize position and wait for the manometer to return to zero before you remove the suction cup (2) from the surface.  
**NOTE!** Do not try to remove the suction cup from the surface with a sharp object.

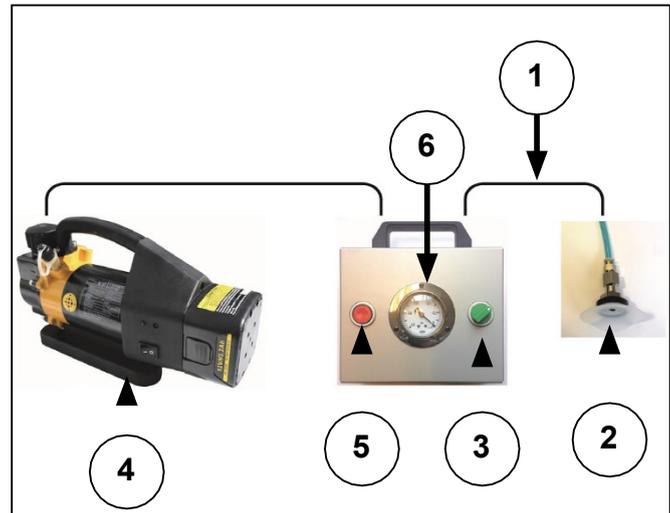


Figure 6: Checking for leaks

## Performing a vacuum test

Only perform a vacuum test in dry conditions. Do not allow moisture to enter the product during the vacuum test. Make sure that the sealing surfaces are clean and dry.

1. Push the fitting on the end of the hose (figure 6, 1) onto the correct pump adaptor for the product. See the table in "Pump adaptor" on page 3.
2. Locate the pressure relief valve (2) on the product and remove it.
3. Clean the valve carefully with water and dry it completely. If the valve is not in perfect condition, replace it.
4. With your fingers, fasten the pump adaptor into the threaded hole where the pressure relief valve was placed.
5. Turn the green test/equalize button (figure 6, 3) to the TEST position.
6. Start the vacuum pump (figure 6, 4).
7. Press the red vacuum button (figure 6, 5) until the manometer (figure 6, 6) shows the correct vacuum level for the product. See the table in figure 8.
8. Release the red vacuum button (figure 6, 5).

If you have applied too much vacuum:

9. Turn the green test/equalize button (figure 6, 3) gradually to the EQUALIZE position to allow air into the system.
10. Turn the green test/equalize button (figure 6, 3) back to the TEST position.
11. Press the red vacuum button (figure 6, 5) until you obtain the correct vacuum level.
12. Release the red vacuum button (figure 6, 5).

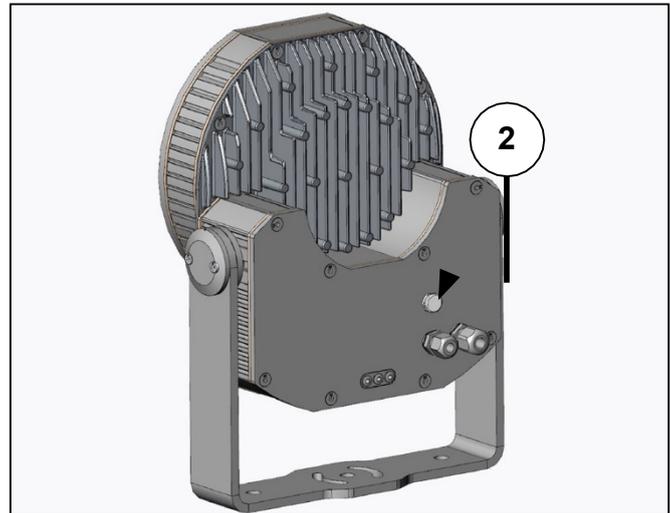


Figure 7: Pressure relief valve on Exterior 400

| Product                   | Vacuum level [bar] |
|---------------------------|--------------------|
| Exterior 200 Series       | -0.5               |
| Exterior 400 Series       | -0.5               |
| Exterior 600 Series       | -0.5               |
| Exterior 1200 Series      | -0.1               |
| Exterior 400 IP           | -0.5               |
| Exterior Inground 400 LED | -0.5               |
| Exterior Inground 200 LED | -0.1               |
| Exterior Wash 100 Series  | -0.5               |
| Exterior Wash 200 Series  | -0.5               |
| Exterior Wash 300 Series  | -0.5               |
| Exterior Linear Series    | -0.5               |
| Exterior Projection 500   | -0.5               |
| Exterior Projection 1000  | -0.5               |
| Extube 300                | -0.1               |
| Extube 1200               | -0.1               |
| Extube 300 Accessories    | -0.1               |
| Extube 1200 Accessories   | -0.1               |
| LC+                       | -0.5               |
| Tripix 300                | -0.6               |
| Tripix 1200               | -0.6               |
| ERA 500                   | -0.3               |
| ELP IP                    | -0.3               |

Figure 8: Vacuum level

Continue the test

13. Watch the needle on the manometer (1) carefully and wait for approximately 30 seconds.

If the needle moves more than 0.025 bar corresponding to half a division on the scale of the manometer, the product is not sealed correctly.

14. Check all covers and seals on the product according to the user manual or service documentation.
15. Make sure that all sealing surfaces are clean, dry and in perfect condition.
16. Tighten cover bolts to the correct torque according to the user manual or service documentation.
17. When you have sealed the product, perform the vacuum test again. See "Performing a vacuum test" on page 5.

If the needle moves no more than 0.025 bar within 30 seconds, the product is sealed correctly and you can continue as mentioned below:

18. Turn off the vacuum pump (figure 6, 4).
19. Turn the green test/equalize button (figure 6, 3) to the EQUALIZE position and wait for the manometer to return to zero.
20. Remove the pump adaptor (figure 3) and immediately mount the pressure relief valve (figure 7) to prevent water droplets from entering the product.

NOTE! The pump adaptors are designed to prevent leaks when you test the product. However, you can save some time by using the suction cup (figure 4, 3) instead of the connectors. If the product is clean and there are no labels close to the hole of the pressure relief valve, place the suction cup over the hole and perform the test.

**FOR THE ERA 500:**

This unit has x3 pressure relief valve locations.

You must repeat the process at each valve location and check if any of the valves are blocked – replace if necessary.

Acceptable pressure drop is 0.045 Bar (~1 division on the scale) over 60 seconds.

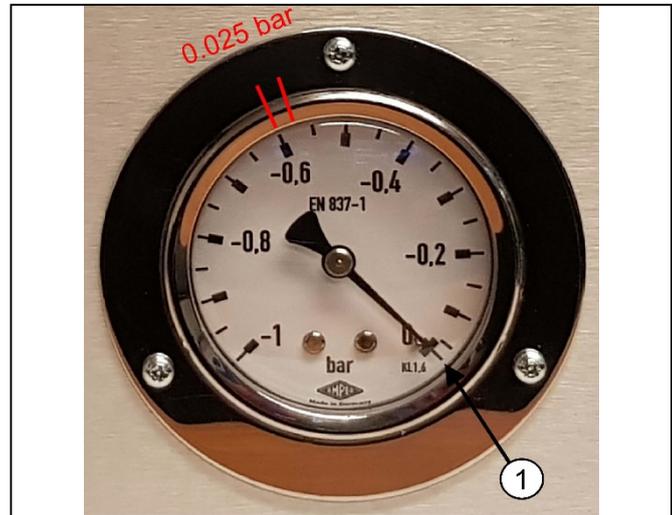


Figure 9: Manometer

## Specifications for vacuum pumps

The vacuum pump must meet the following specifications:

- Pumping capacity: Minimum 30 liters per minute.
- Maximum vacuum: Minimum 10 Pa/0.0001 bar, maximum 50 Pa/0.0005 bar.

We recommend the vacuum pumps mentioned below.



Figure 10: Battery-driven vacuum pump

## Battery-driven vacuum pump kit

The vacuum pump kit consists of:

- heavy-duty metal carry case.
- 1 CFM vacuum pump.
- 2 x NiHh 12 V rechargeable batteries.
- Battery charger.
- Oil for vacuum pump.

Link: <http://www.hvacstore.co.uk/acatalog/Battery-Powered-Vacuum-Pump--12v--DC.html>.



Figure 11: Vacuum pump kit

## Mains-driven vacuum pump

Links:

- <http://www.shop.wiltec.info/>.
- [http://shop.wiltec.info/product\\_info.php/info/p4735\\_Unterdruckpumpe---Vakuumpumpe-Vakuu-Pumpe-84l---3cfm---10Pa.html](http://shop.wiltec.info/product_info.php/info/p4735_Unterdruckpumpe---Vakuumpumpe-Vakuu-Pumpe-84l---3cfm---10Pa.html).



Figure 12: Mains-driven vacuum pump

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