

AMERICAN VS. EUROPEAN STANDARD SIGNAL OUTPUT

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| IN BLOGS

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Not all fluid [level senders](#) and [gauges](#) are built alike. One of the most significant differences is the resistance level readings. Specifically, products manufactured for American and European standards have different specifications you'll need to be aware of to ensure compatibility in your system.

With that in mind, let's look at the primary differences between American and European output specifications for level senders and gauges used in [Vehicle](#), [Marine](#) and [Industrial](#) applications.

Signal Differences Between American and European Standards

The main difference between European and American output standards is the resistance specifications. Standard American gauges and senders are designed to work with a variable resistance from 240 ohms empty to 33 ohms full, while European products are designed to work with a variable resistance from 0 ohms empty to 180 ohms full. Though these numbers represent standard specifications, senders and gauges can also have custom resistance values.

American Standard Output

The American Standard Output is **non-linear** and based on American Boat and Yacht Council standards with plus or minus 5% tolerance for range difference.

Resistance readings at different levels are as follows:

- 33 ohms at 100%
- 67.5 ohms at 75%
- 105 ohms at 50%
- 142.5 ohms at 25%
- 240 ohms at 0%

European Standard Output

The European Standard Output is **linear** with a range difference of plus or minus 5% tolerance.

Resistance readings at different levels are as follows:

- 180 ohms at 100%
- 135 ohms at 75%
- 90 ohms at 50%
- 45 ohms at 25%
- 0 ohms at 0%

What Is Resistance?

Resistance, measured in ohms, is a common way to measure fluid levels. Inside a storage tank, the amount of contact between two wires can be expressed in numerical form to determine the fluid level inside of the tank.

In simpler terms, resistance is the language the level sender and gauge instruments use to “talk” to one another. However, American and European products are essentially speaking different languages.

Why Does Resistance Matter?

Both the level sender and the gauge must have the same resistance range in order to understand one another. If an American and European sender and gauge are paired together, the gauge will read backwards.

How to Test the Specs of Your Equipment

The process for testing your equipment is simple. However, the processes vary depending on whether you are testing gauges or senders as well as whether you have access to your gauge wiring.

How to Test When You Have Access to Gauge Wiring

1. Before beginning the test, ensure that your gauge has been powered off.
2. Once the power is off, disconnect the black sender wire from the back of the gauge.
3. Once the black wire is disconnected, power the gauge back on and check the reading on the display.
 - If the gauge is American, you will see an “empty” reading.
 - If the gauge is European, you will see a “full” reading.
4. To ensure gauges are working properly, touch the black wire to earth.
 - An American gauge shows a “full” reading if the gauge is working properly.
 - A European gauge shows an “empty” reading if the gauge is working properly.

How to Test Without Access to Gauge Wiring

If you do not have access to the gauge wiring, you will need to use an alternative method to test your gauges.

1. First, disconnect the two wires in the loom attached to the sender side of the connection.
2. Once these two wires are disconnected, touch them together on the gauge side of the loom.
 - An American gauge will show as “empty.”
 - A European gauge will show as “full.”
3. To verify the proper function of the gauges, touch the black wire to earth.
 - An American gauge will then move to the “full” position.
 - A European gauge will move to an “empty” position.

How to Test the Specs of Your Fluid Level Sender

The process for testing a fluid-level sender is straightforward but requires the right tools for the job. You can test the specification of your fluid level sender using a multimeter.

1. First, disconnect the two wires attached to the top of the sender unit, and remove the unit from the tank.
2. Connect the wires on the sender to the multimeter, and set the multimeter to the resistance setting.
3. To test the level sender, first, move the float to the top of the sender unit and check the multimeter reading.
 - For American units, the reading should be 30 ohms.
 - The European unit should be 180 ohms.
4. Next, move the float to the bottom of the unit and check the multimeter again.
 - For American units, the reading should be 240 ohms.
 - The European unit should be 0 ohms.
5. These readings will confirm both that your sender is outputting correct information as well as the specifications to which the sender has been built.

Source: [American vs. European Standard Signal Output | KUS Americas, Inc. \(kus-usa.com\)](https://www.kus-usa.com/american-vs-european-standard-signal-output/)