Selecting the Best Dissolved Oxygen Meter: Features to Consider Beyond Sensor Technology - A Comparison of the Pro20 vs 55

a xylem brand

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There are many different types of dissolved oxygen sensors commercially available in portable, compact handheld instruments. These instruments allow for rapid and accurate field detection of dissolved oxygen in aqueous solutions. The different types of dissolved oxygen sensing technologies include optical, polarographic, and galvanic. There are advantages associated with each type of sensor; for example, an optical sensor doesn't require any stirring or water movement for accurate measurements while an electrochemical sensor requires some amount of water movement or stirring. But what if you had two instruments that measured dissolved oxygen with the same sensor technology? What should you consider before making a purchasing decision?

YSI Pro20 vs. YSI 55

Let's compare the YSI model 55 and Pro20, www.ysi.com/pro20. Both of these instruments are portable handheld meters and measure dissolved oxygen with a steady-state polarographic sensor. In order to make an educated purchasing decision between the two, it is important to compare the features of the instruments to determine which set of features best meets your needs.

If you are purchasing an instrument for field use, it is important to review the durability of the instruments. Is it waterproof in case someone accidently drops it in the water? How long will it last? These are all good considerations before making a purchasing decision. In our comparison example, the Pro20 is completely waterproof (IP-67 rated). It is even waterproof with or without the battery cover. This helps for real world applications since sometimes you have to change batteries while you are out in the field. It is also waterproof with or without the cable installed via its robust military spec connector. The model 55 is water resistant (IP-65 rated). This means the model 55 can handle splashes from all directions, but cannot be submerged in water.

To further evaluate the robustness of the instrument's design, compare the warranty that is included with the purchase. The Pro20 comes with a three year warranty on the handheld, a two year warranty on the cable and one year warranty on the polarographic sensor.

The model 55 by comparison, comes with a 2 year warranty on the handheld and a 1 year warranty on the cable and sensor. This indicates that the Pro20 is more robust and designed to withstand harsher field environments for longer periods of time. The Pro20's superior warranty also protects your investment longer.

Once you have compared the field worthiness of the instruments, you should then compare how easy it is to use them. Can anyone use it or does it require specialized training? Does it have an intuitive user-interface or does it require constant reference to a manual? In comparing the 55 and Pro20, both instruments are easy-to-use, but the Pro20 does have some added advantages.

For example, the Pro20 has a more streamlined calibration procedure with its "Quick Cal" feature. With the Pro20, calibrating is as easy as placing the probe in a 100% humid environment and pressing the "Cal" key for 3 seconds. This automatically calibrates the Pro20. The model 55, on the other hand, requires the user to remember a key sequence to access the calibration screen and several other key presses in order to complete the process.

Additionally, the Pro20 simplifies routine maintenance by utilizing screw-on cap membranes. The cap membranes are easy-to-use and install correctly every time. This makes regular membrane changes quick and accurate. The 55 uses stretch membranes which can be a bit more difficult to install and may not always go on right the first time.
The Pro20 also has a more advanced, menu-driven user-interface with status messages that are translated into multiple languages (English, Spanish, French and German). The Pro20's menu-driven operation makes it easy to use without an operations manual. Simply highlight the function you want to access and press enter to save data, view data, calibrate the internal barometer or change the salinity correction factor. The added feature of status messages in multiple languages helps the user understand if they are getting good readings, performing a good calibration

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or if the instrument needs servicing since all of the status messages and menu items are translated. The user can read the status message in their native language and won't have to memorize error codes. By comparison, the 55 does not have a menu-driven user interface, status messages, or the ability to save and review data.

The easier the product is to use, the more likely you are to get accurate data so now is a good time to discuss how one instrument may provide better measurements than another. As mentioned, the Pro20 has an internal barometer for DO calibration while the 55 does not. The internal barometer makes the Pro20's calibration quick, easy and more accurate than the 55's calibration procedure which calibrates to the local elevation in 100s of feet. This feature, along with other advances in the circuitry of the Pro20, results in a system accuracy spec of +/-0.2 mg/L versus the 55 which has an accuracy spec of +/-0.3 mg/L.

While evaluating how easy it is to obtain accurate field measurements, you should also evaluate the flow dependency of the instrument's sensor. All electrochemical DO sensors have some flow dependency because they consume oxygen at the membrane surface. This flow dependency is overcome by water movement and/or moving the probe in the water. The 55, for example, requires 12 inches/second of water movement across the membrane in order to get accurate results. The Pro20 only requires 3 inches/second of water movement for accurate measurements; therefore, you are more likely to get accurate, repeatable measurements from the Pro20 since it requires less expertise by the technician.

The last item you should consider is the total cost of ownership of the product. This should not only include the instrument's initial acquisition price but also the cost to maintain the instrument over its lifetime. As mentioned previously, the Pro20 carries a longer warranty than the 55 which results in a lower total cost of ownership since you are guaranteed a working product for a longer period of time. Secondly, the Pro20 has a detachable cable and a user-replaceable electrode. This allows the user to replace the cable or probe without having to send it in for service. This saves money in several ways: it avoids costly shipping rates, labor rates for the repair and, most importantly, it avoids down time at your facility by keeping the instrument in your hands. The 55's cable isn't detachable so if there is a problem with the cable or sensor, it is usually sent to a service center since opening the instrument would void the warranty. Additionally, the 55's sensor is integral to the cable so you need to replace the entire sensor and cable assembly if one fails. With the Pro20, you can replace the cable or the sensor depending on the problem which saves in repair costs.

As you can see, there are several factors to consider when purchasing a new DO instrument and there have been a lot of advances in portable DO instruments over the last 15 years. Next time you are considering a new instrument, review the features of some of the newer models and see if an upgrade is right for your facility. It may save you time and money!

www.ysi.com/weknowDO

Summary of Pro20 and 55 Comparisons:

Feature	Pro20	55
Water Rating	IP67 - waterproof	IP65 - water resistant
Warranty	3 years instrument 2 years cable 1 year sensor	2 years instrument 1 year cable and probe
Language	English, French, German, Spanish	English
User Interface	Menu driven; labeled buttons	N/A
Calibration	"Quick Cal" - calibrates in seconds; uses internal barometer	Button sequence to enter information
Internal Barometer	Yes	No
DO Accuracy	±0.3 mg/L	±0.2 mg/L
Data Memory	Yes; 50 data sets	No
Flow Dependence	3 in/second with 2.0 PE membrane; 6 in/second with 1.25 PE membrane	12 in/second with FEP fluoropolymer film
Membranes	Easy screw-on cap	Stretch over
Replaceable Cable and Sensor	Yes	No