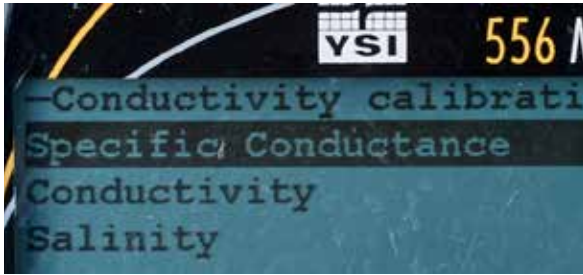


Measuring Electrical Conductivity Correctly



There appears to be some confusion about the measurement of Electrical Conductivity (EC).

Electrical Conductivity of water is normally reported AS IF the temperature of the water is 25 degrees Celsius (ISO/EN27888). This has nothing to do with the actual temperature of the water but it is the way reporting is done so that everyone can compare results. EC of water is normally expressed as Siemens/cm and occasionally as Siemens/metre.

The conversion is simple: $1 \text{ mS/m} = 1 \text{ mS}/100\text{cm} = 1000 \text{ microS}/100\text{cm} = 10 \text{ microS}/\text{cm}$.

Example: Conductivity is NOT expressed as 1045 microS/cm at 11 degrees Celsius. The meter must be told about the temperature and it will recalculate it AS IF the water had been at 25 degrees Celsius which is 1413 microS/cm.

For those of you who use the YSI meters this is reported by the instrument as SPECIFIC CONDUCTANCE (Americanisation of specific conductivity). However, YSI and some other manufacturers often have an option to set CONDUCTIVITY as well or instead of SPECIFIC CONDUCTANCE. All YSI meters, whether for sale or rent supplied by Van Walt are set by us to only show the SPECIFIC CONDUCTANCE menu but be CAREFUL because some users, for their own reasons, (re)activate the CONDUCTIVITY menu and this can lead to confusion because you will then have two sets of results for EC. You can tell the difference because specific conductance is shown as mS/ccm and conductivity as mS/cm.

If, by accident or design, you then take the CONDUCTIVITY READINGS you can convert using the following table as long as, at the time of measurement, you also recorded the temperature. This is based on a 0.01 Mol KCl calibration standard:

Temperature in deg. c	EC in microS / cm
25	1413
20	1278
15	1147
10	1020
5	896

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Please note that this is not a linear curve and if you require intermediate temperatures please ask us for a fuller table or construct your own graph.

A note on calibration:

It would be wise to always make sure you choose the option SPECIFIC CONDUCTANCE when you are calibrating the EC probe. Like this you can use the conversion table above (as long as you also recorded the temperature of the sample) if you inadvertently only recorded conductivity instead of specific conductivity. If you calibrate to Specific Conductance ALWAYS make sure that the value of the standard is chosen for 25 deg C. if you are using one of our standards (0.01 M KCl), the EC is 1413 microS/cm.

Most of the above is specific to YSI meters and if you use a meter from a different manufacturer refer to their manual as some of the terms might be different. In principle however all modern high quality meters will work in more or less the same way.