Why does Risycor need a “stable” temperature?

During development it was found that corrosion measurements are influenced by system water temperature. To overcome this problem a temperature sensor was integrated in the probe of the Risycor so that the corrosion measurements can be “temperature compensated”.

A “stable” temperature is required during the time of the measurement. If the temperature varies too much during the measurement the value will be disregarded. If there are too many unstable measurements during the 20 minute interval, the Risycor cannot record an accurate corrosion rate.

How to obtain stable measurements?

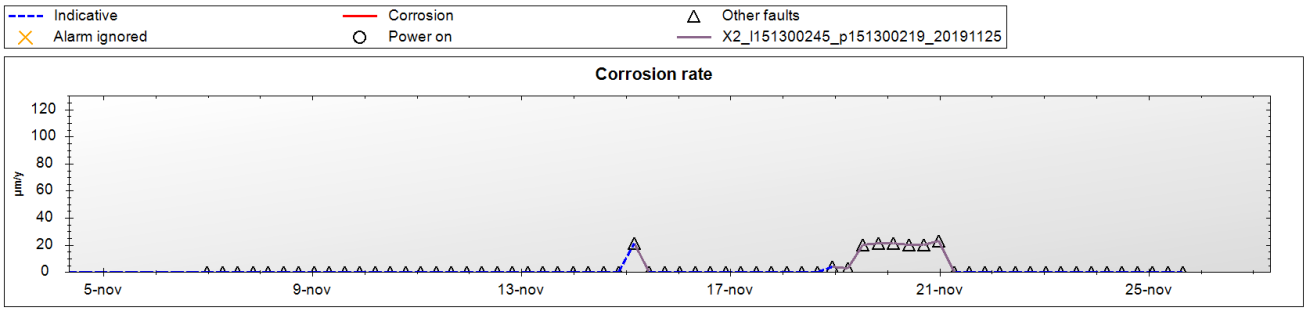
We recommend that the Risycor is positioned in the return pipe as the temperature is normally constant enough for Risycor to log stable measurements.

In systems with a low loss header temperatures can change rapidly on the primary side. It is therefore recommended that the Risycor is fitted in the common return on the secondary side. Installation on the shunt return or primary side of the header is not recommended. Obviously, a Risycor in the expansion line (membrane expansion tank, pressurisation system etc.) will only see stable temperature.

NOTE: Normal changes during heating up or cooling down do not affect the measurements of the Risycor.

How do I know if my Risycor is recording too many unstable temperature readings?

This will be shown as a triangle on the dashboard graph and the Risycor status alarm will be activated (Right hand LED is red and VFC is open).



Rapid fluctuating temperatures within a short time frame usually means that the system is hydronically not well controlled and/or balanced, indicating that behaviour of controls and system balancing needs to be reviewed.

Note: The temperature shown on the dashboard graph is the interval temperature, at the time the Yearly Corrosion Rate is logged every 7 hours.

Updated: 23/11/2023

Why and what kind of “stable temperature” for the Risycor?

The built-in temperature sensor, the coupon, the body of the probe and the built-in electronics all have their own reaction time to varying temperatures, together they define the so-called “time constant” of the probe, being approx. 170 seconds. Engineering practice prescribes 5 x 170 seconds = 850 seconds to be sure that one has a 100% stable temperature. Recording values at a faster pace implicates possibly erratic data.

However, the pulse counts of the pickup element (Hall effect) hardly changes after 100 seconds, so we fixed the sample recording time to the latter in order to obtain a high number of “similar/stable” records. Within the recording window of 20 minutes = 1200 seconds means we can store 12 series of measurements that will contain data that can be compared to one another as follows: ° As soon as 3 samples in succession differ by a maximum of 1°C, Risycor defines the values obtained as being OK. If the difference is larger, he’ll continue sampling, with a maximum of 20 minutes. After 20 minutes since the first sample, a new samples series starts. ° If this is not possible during these 20 minutes, Risycor defines the data within this window as being an unstable measurement.

(note: X-series stores everything, CBU does not store unstable measurements within the measurement buffer)

One unstable measurement every now and then not being a substantial problem, the Risycor will produce an “unstable measurement alarm” (VFC) and plot a triangle on the corrosion graph if a substantial number of measurements in the measurement buffer contains such information. The exact number may vary with the type of Risycor and a hysteresis between alarm “on” and “off”.

Only measurements with a maximum age of 7 days are taken into account for the calculations of the Yearly Corrosion Rate.

Updated: 23/11/2023