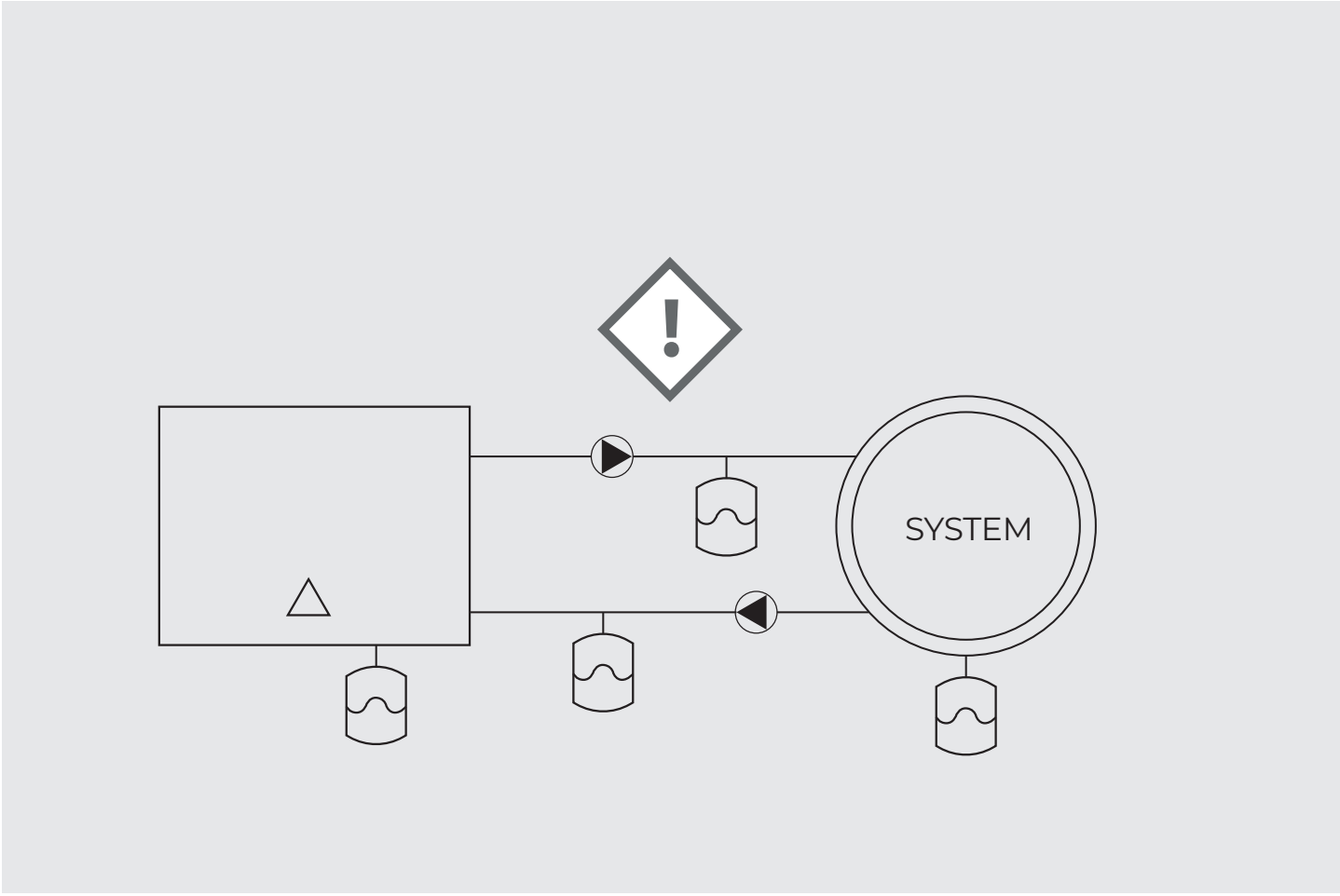
risycard

RICA 03 - Neutral point



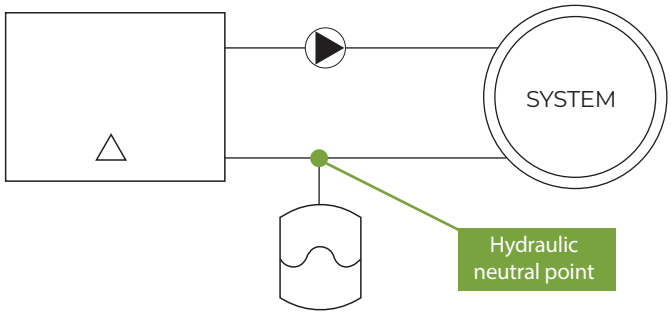
RISK OF OXYGEN ENTRY

Sometimes installations have a tendency to suck in air, again and again, while in theory this should not be possible, and apparently everything is in order (see our Risycards and Risybasics).
This is often caused by an incorrectly positioned neutral point, causing the circulation pump to create negative pressure, with the expensive and troublesome consequences of unwanted oxygen entry and thus corrosion (sludge formation).

OPERATION

From a hydraulic point of view the point at which the expansion vessel is connected becomes the zero point of the system. It is physically impossible for the circulation pump to increase or decrease pressure at the point of the expansion vessel/system.

- If the circulation pump was able to reduce the pressure at the expansion vessel (expansion vessel on the suction side of the pump), this would mean that the pump could “magically remove” water from the expansion vessel, to reduce the pressure. This is of course impossible as water is not compressible.
- If the circulation pump could increase the pressure at the expansion vessel (expansion vessel on the discharge side of the pump), this would mean that the pump could “magically add” water to the expansion vessel from somewhere in the system to increase the pressure. This is of course impossible as water is not compressible.



It is therefore a given that the system pressure at the neutral point cannot vary due to the circulating pump starting or stopping.

Clearly, the system pressure on the suction side of the circulation pump is lower than on the discharge side. This pressure difference is determined by the correlation between the pump characteristic (also called head) and the pressure loss characteristic of the installation (flow losses).

The importance of a correct positioning of the neutral point (i.e. the correct location for connecting the expansion vessel) lies in the fact that negative pressure should never arise anywhere due to the operation of the circulation pump. After all, a system under negative pressure opens the door to oxygen entry, see also RICA 01

For a deeper insight into the theory of the neutral point, we refer to “RISYBASIC PRESSURE MAINTENANCE”

RISK OF OXYGEN ENTRY

With correct pressure maintenance, oxygen entry through negative pressure will not occur.

Conditions are:

- correct dimensioning, adjustment, operation, use and maintenance of the expansion vessel / expansion system.
- correct location of the neutral point: **if the neutral point is not on the suction side of the circulation pump, there is a high risk of negative pressure. This allows automatic air vents to draw in air** (see RICA 01).

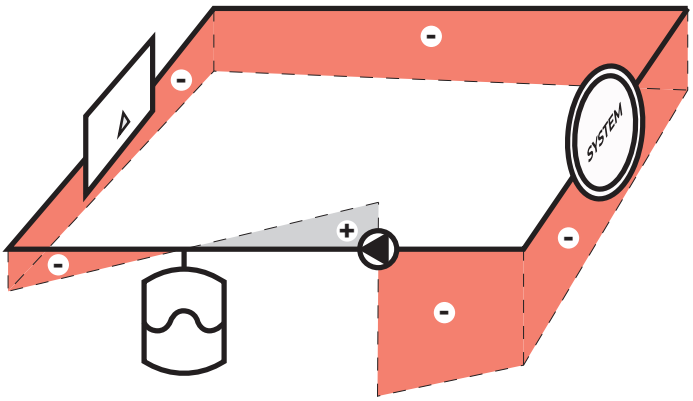


Fig.: wrong neutral point

The dynamic pressure in the system is linked to the developed pump head of the circulation pump, the associated flow losses and the control behaviour of zone- and thermostatic valves. Operating regimes that reduce temperature at night or at weekend make it difficult to identify an incorrect neutral point as the cause of oxygen ingress.

There are several case studies available from Resus that illustrate the Risks covered in the Risycard series.

DID YOU KNOW

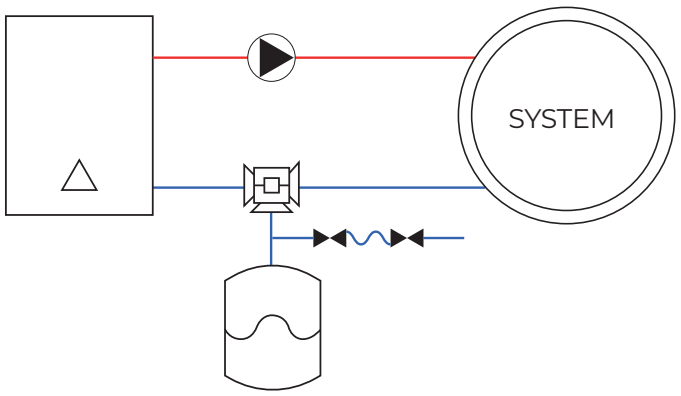
If a pressure gauge at the neutral point varies under the influence of a starting or stopping circulation pump, this would be proof that water is compressible, which of course is impossible. It must then be concluded that there are air bubbles somewhere in the installation (which are compressible). These undergo volume changes under the influence of the changing (pump) pressure and thus influence the neutral point. There is then no longer a fixed neutral point in the installation.

THE IMPORTANCE OF RISYCOR

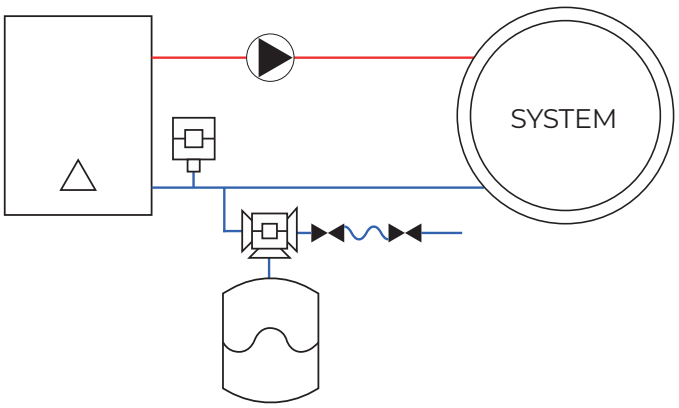
For the correct installation of a Risycor, please refer to the Application Guideline.

For a good follow-up of the entire installation, the recorded data should be checked using the Resus dashboard at least once a year.

≤ 70 kW



> 70 kW



ABOUT US

Resus is the manufacturer of Risycor, a system for continuous corrosion monitoring in closed heating and cooling systems. Like a smoke detector, a Risycor is an early warning system that prevents problems by providing an early warning.

Corrosion is ALWAYS the result of oxygen ingress, which in 90% of the cases
Is the result of poor pressure control. The remainder of the cases are often the result of failing risk components. Read more about this in our Risycards and Risybasics.
The application of Risycor is explained in the Risycor Application Guidelines.

READ ALSO

RICA 01 - automatic air vents
RICA 02 - green zone
RICA 03 - neutral point
RICA 04 - failing air non return valve
RICA 05 - oxygen diffusion open bladder
RICA 06 - breakdown of PWH water
RICA 07 - oxygen diffusion
RICA 08 - content indication constant pressure
RICA 09 - clopen systems
RICA 10 - pre-pressure

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