

# SAFETY COOLER

The Safety Cooler is based on the « tube in tube » principle. An unlikely leak is detected by the increase or the decrease of the pressure of the intermediate fluid.

## Construction

The tube bundle in the shell is composed of a number of straight and smooth tubes and two tube plates. One of the tube plates has a fixed position compared to the shell, the other one can follow the thermal dilatations. In this tube bundle is entered an other tube bundle with tubes of a slightly smaller diameter and a little longer in length. This second tube bundle has also two tube plates; again one is fixed compared to the shell, the other one can follow the thermal dilatations.

The inner tubes have no firm metallic contact with the outer tubes. Both the inner and the outer tubes are welded to their respective tube plates.

The distance between the tube plates of the inner tubes and the tube plates of the outer tubes is created by a junction piece that also has connections for the pressure switch and the hydraulic accumulator.

Each tube plate has two O-rings. One O-ring ensures the tightness of the shell side or the tube side and the other O-ring ensures the tightness of the intermediate space. In this way any mixing between the two process fluids is excluded and any leak can be detected.

On the junction pieces are mounted: a safety valve, a pressure gauge, a pressure switch, a hydraulic accumulator and two service valves. By creating a vacuum through the first valve, the intermediate space can be charged of water (or glycol water) through the second valve. Then the intermediate space is pressurised at the chosen pressure by the hydraulic accumulator and finally sealed.

## Pressure Switch

The supplied pressure switch has two switching set points.

1. The pressures of the process fluids are very different. For example: oil pressure 20 bar and water pressure 3 bar. Set the pressure switch at an intermediate pressure for example 12 bar (neutral zone +/- 3 bar).

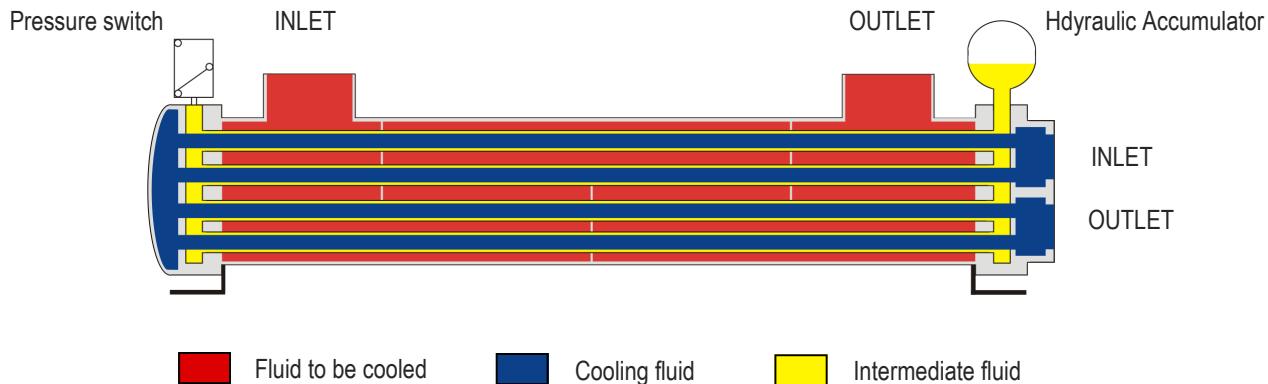


The triggered switching point clearly identifies the direction of the leak.

2. The pressures of the process fluids are almost identical. For example: oil pressure 5 bar and water pressure 3 bar. Set the pressure switch at an intermediate pressure for example 12 bar (neutral zone +/- 3 bar).



A leak will be detected by a decrease of the pressure. In this case the switching point does not enable to detect the direction of the leak.



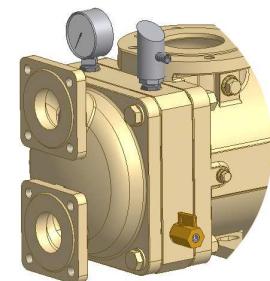
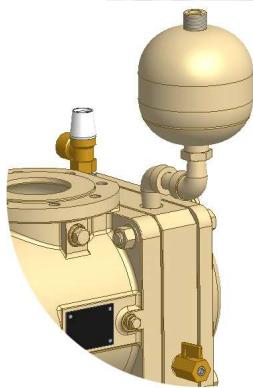
## ADVANTAGES

- No intermediate circuit to be build on site
- Any mixing between the process fluids is excluded
- Immediate detection of an unlikely leak by the change in pressure of the intermediate space
- Detection of the leak independently of the viscosity or the temperature of the fluids
- No internal corrosion since no metallic contact between the tube bundles
- In case of very different pressures of the process fluids, detection of the direction of leak is possible
- Positive safety : fault message in case of a pressure drop of the intermediate circuit due to a leak to the outside

# SAFETY COOLER

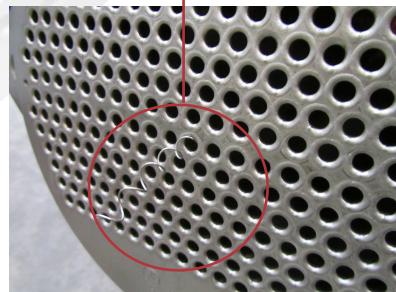
## SCOPE OF SUPPLY

- The double tube heat exchanger
- Pressure gauge, electronic pressure switch, hydraulic accumulator and service valves for the intermediate
- Flanges and counter-flanges for the process fluids
  - Plugs for draining and venting on the process fluids
  - Adjustable mounting feet



## HS COOLER TECHNOLOGY

- internally smooth and straight tubes in Stainless Steel 1.4404 (AISI 316L)
- tube plates in Stainless Steel 1.4301 (AISI 303)
- water boxes in cast iron
- tubes welded to the tube plates
- turbulators in Stainless Steel depending on applications
- aluminium fins depending on applications
- baffles in aluminium
- shell in carbon steel

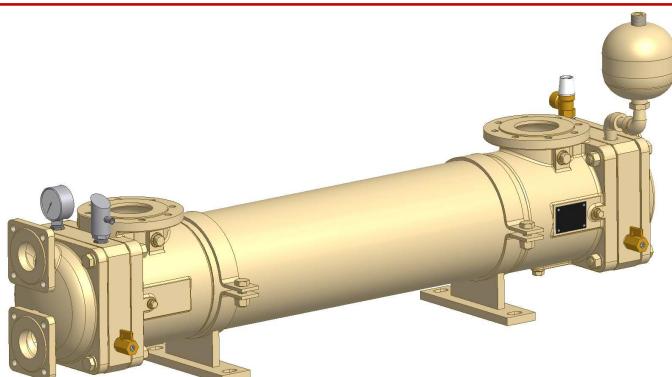


## OPTIONS

- Tube plates in Stainless Steel 1.4404 (AISI 316L)
- Water boxes in Stainless Steel 1.4404 (AISI 316L)
- Baffles in Stainless Steel 1.4404 (AISI 316L)
- Externally smooth tubes (no fins)
- Shell in Stainless Steel
- .....

## APPLICATIONS

- **make up of hot sanitary water** by heat recovery from the oil circuit of compressors
- **make up of hot sanitary water** by heat recovery from the desuperheating in refrigeration plants
- Cooling of process fluids, oil, condensation of refrigerants .... with river water or well water
- Any application where the mixing of process fluids must be avoided
- .....



The safety cooler is not certified « food grade » and must before use be cleaned from residual greases and other impurities from the manufacturing process.