

"PASSIVE" REGULATION OF FLUID CIRCUITS

Main Technological Area → Energy

Keywords → fluid circuit | temperature-sensitive valves | energy saving | intrinsic control | reliability and maintainability

Solution for the heat transfer in fluid circuits, with a temperature control that does not require energy, improves reliability and reduces maintenance. These features are achieved by using temperature-sensitive valves that automatically open and close at programmable temperatures. In essence, the circuit exercises a heating (cooling) action when the temperature of the fluid is below (above) a predetermined value intermission.

TECHNICAL SPECIFICATIONS

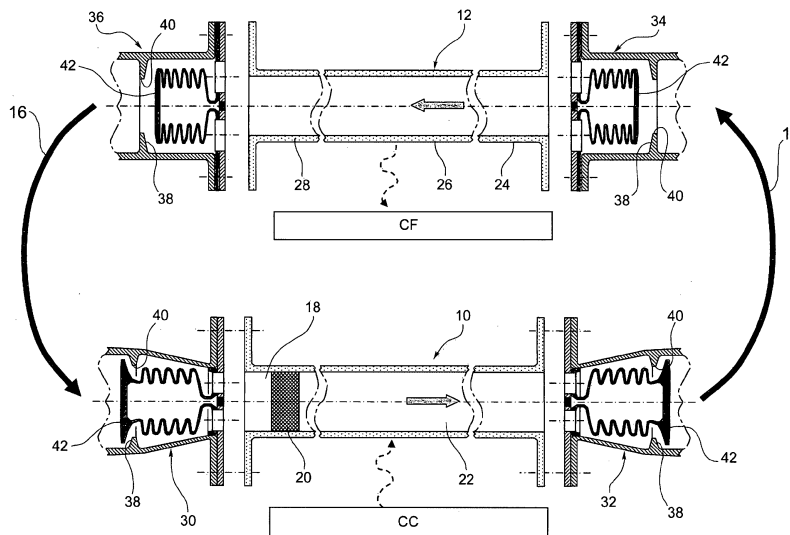


Figure 1 – Schematic view of a cooling/heating circuit

Fluid circuits equipped with thermal expansion valves of the following types:

- Cold opening valves: they interrupt the flow in the circuit when the valve temperature is higher than the programmed cold threshold temperature; modulate the flow in the circuit as a function of the valve temperature when this is less than the cold threshold
- Valves with hot opening: they interrupt the flow in the circuit when the valve temperature is lower than the programmed temperature of the hot threshold; modulate the flow in the circuit as a function of the valve temperature when this is greater than the hot threshold.

INNOVATION/ADVANTAGES

- The system does not require components powered by external energy (pumps, motorized valves);
- Circuit assembly and disassembly operations do not require the circuit to be emptied;
 - The operating temperature range can be programmed through the filling gas pressure of the valves.

**FIELDS OF APPLICATION**

Heat transfer associated with temperature control without energy costs. Examples:

Unmanned	Engine cooling for UAVs, motors with photovoltaic power supply
Rinnovabili/Utilities	"Geothermal" air conditioning for residential buildings

PATENT INFORMATION

Priority Date - 2013/10/29

Priority Code – IT TO20130873

IPC Codes – F28D 15/02 | F28D 15/06

Active worldwide applications

EPO - EP2869014B1; filing date: 2014/10/28; grant date: 2016/12/07

National Extensions: Italy, Germany, Spain, United Kingdom, France

USA - US10337803; filing date: 2014/10/28; grant date: 2019/7/2

Leonardo internal code

LDO-A501