LEONARDO

**PATENT BROCHURE**

# CONNECTION DEVICE FOR FLUID CIRCUITS

Main Technological Area ⟶ Thermal control, Mechanics, Hydraulics

Keywords ⟶ Fluid Circuits | Connection-Disconnection Device | Reliability | Maintainability

Connection / disconnection device for fluid circuit lines . It allows connection/disconnection operations between lines without emptying the circuit and without causing fluid leakage from the lines of the circuit itself.

## TECHNICAL FEATURES

The device consists of two thermal expansion valves with bellows filled with gas and connected against each other. Both of these valves are also connected to the end of a fluid line and passes from the closed to the open position (and vice versa) depending on whether the temperature of the filling gas is higher or lower than a certain threshold. This threshold is programmable during filling through the pressure of the gas in the bellows contained in the valve itself.

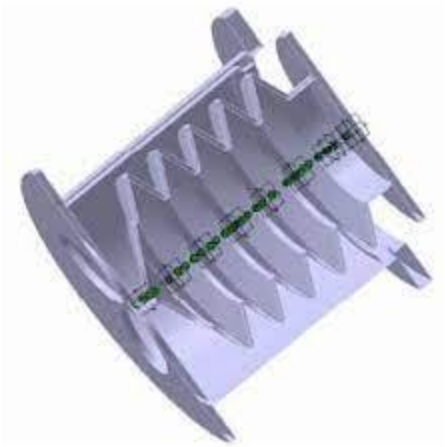


**Figure 1 – Detail of device**

## INNOVATION/ADVANTAGES

The "state of the art" consists of devices called "Self Sealing Quick Disconnects" (patent US3291152, 13/12/1966). Compared to them, this solution has the following advantages:

- The connection / disconnection operations do not produce pressure peaks (commonly called "water hammers") because the bellows filled with gas act as "dampers";
- The device has reduced dimensions and mass;
- The device is simpler to build and program;
- The temperature at which it is possible to make the connection / disconnection with closed valves (and zero fluid leakage) can be programmed by filling the valves with gas and can also be modified during operation, varying the gas content.

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FIELDS OF APPLICATION

| | |
|---|---|
| ***Electronics*** | Thermal control of electronic devices having high thermal dissipation |
| ***Thermal plants*** | Integration and maintenance of fluid circuits in all applications. Damping in ground turbogeneration plants |

PATENT INFORMATION

**Priority Date** – 2015/05/05

**Priority Code** - IT 102015000013948

**IPC Codes** – F16L 23/00 | F16L 29/00 | F16L 29/04 | F16L 55/10

**Active worldwide applications**

EPO – EP3091262B1 ; filing date: 2016/04/29; grant date: 2018/07/18
ITALY – UNITED KINGDOM

USA – US10678275; filing date: 2016/05/03; grant date: 2020/05/07
JAPAN - JP6738192; filing date: 02/05/2016; grant date: 12/08/2020

**Leonardo internal code**

LDO-A520