

4-WAYRefrigera: the solution for reversing cycles



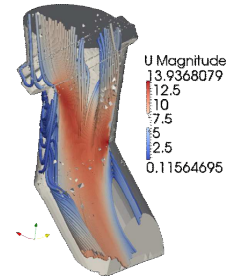
New 4Way Reversing Ball Valve

In applications such as heat pumps or reversible air conditioning units

The 4-way Reversing Valve is the key component to provide Heating and Cooling by reversing the flow direction of refrigerant. Valves are suitable for all P.E. Directive Group 2 refrigerants and operate under the full pressure of the heat pump system. The cycle inversion needs no solenoid pilot valve and no slider movement, reducing risk of mechanical seizures. In addition, in comparison with the solenoid piloted valves, where the pressure differential pilots the

movement of a slider, which changes the direction of the refrigerant, the ball-valve design guarantees minimum pressure drop and very low risk of leakage and ensures quick changeover, even without any pressure differential: the ball is suspended by 4 Teflon seats, it is able to perfectly works even at maximum temperature or even in case of total absence of pressure in the system. The models offer a wide range of connection sizes and allows special configurations and capacity for specific

applications on request. 4-way Reversing Valves are CE approved products according to 93-27-EC Directive.



Flow Analysis Report of a 28mm ODS R744 high pressure 4-Way valve

High Quality Components and Materials

ISO5211 FLANGE - 11SMn37

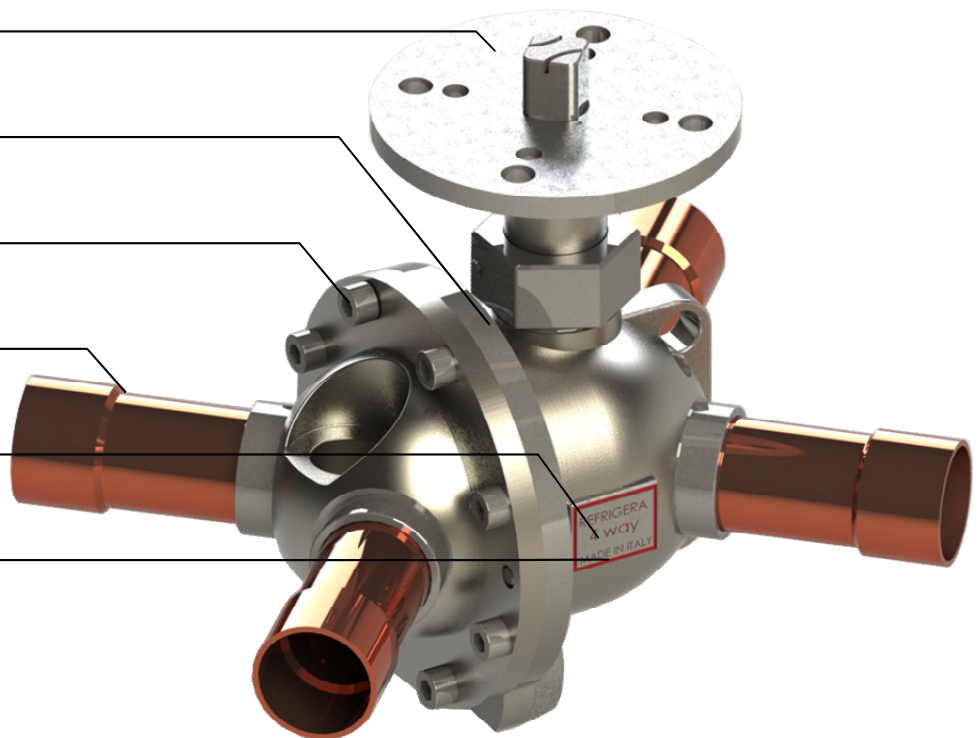
AISI304 STEEL BODY

UNI10011 8.8-CLASS BOLTS

AISI304 CONNECTIONS

PTFE SEATS

HNBR O-RING GASKETS



The quality and the design of this new component were carefully designed to guarantee safe and endurance at highest working conditions. Brass body and AISI304

connections assure high performance even in the wide range of R744 applications. As an option, Refrigera can supply the valve mounting **CuFe2P** tubes, with socket welding

connections. ISO5211 Flange, purposely burst-proof designed for heavy duty HVAC applications, allows easy coupling to every actuator model on the market.



extremely easy to connect to other components

Diverting valve or Mixing valve

The challenge to ensure appropriate flow-sections in both opening configurations was won in close partnership between Refrigera Industriale and the International School of Doctorate in Environmental and Industrial Fluid Mechanics University of Trieste, that tested new 4Way entire range by CFD software and analyzed

all the diameters with an appropriate theoretical support. Kv coefficient results maximized for each size. The coplanar "X" configuration of the tubes makes it extremely easy to connect it to other components and its insertion in every plant layout. In low temperature radiant heating and snow-melting applications,

the valve can be used as a mixing device to regulate the temperature of the flow. With special electric actuators it is possible to proportionally regulate the position of the valve shaft and to determine the quantities of hot and cold fluid entering the valve.

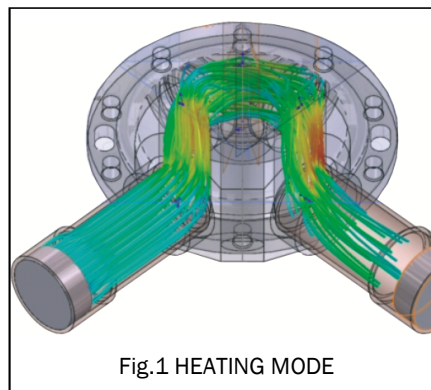
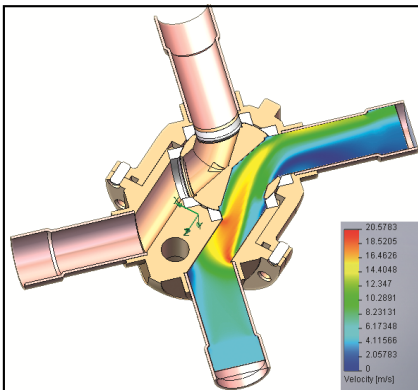


Fig.1 HEATING MODE

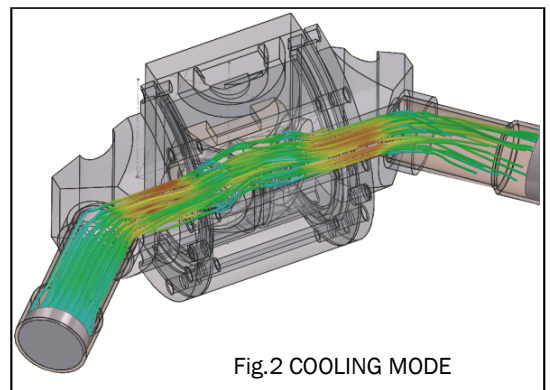


Fig.2 COOLING MODE

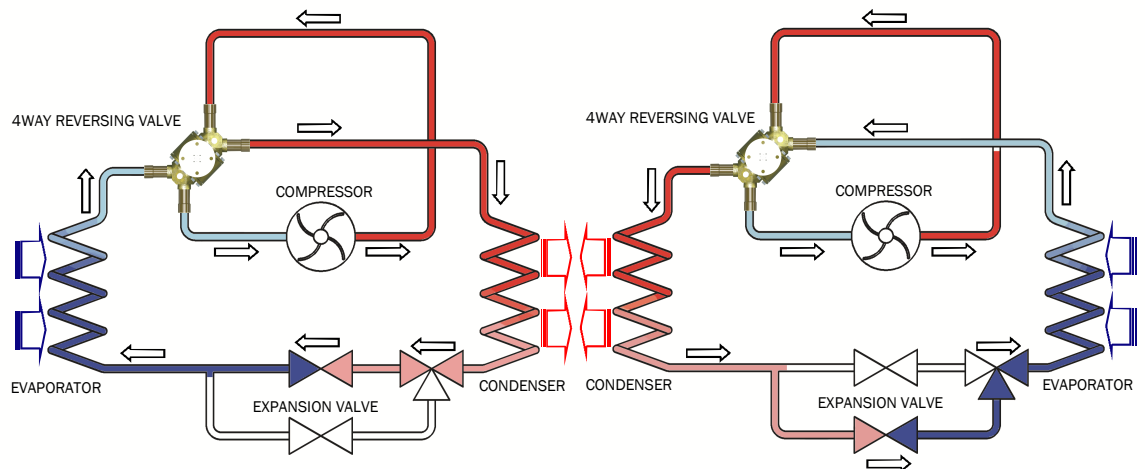


Fig.3 HEATING CYCLE

Fig.4 COOLING CYCLE

The definitive advantages in respect to a solenoid operated reversing valves – slide type with pilot valve are:

- better resistance in handling;
- easier to assembly;
- more intuitive to positioning in the system;
- more reliability in use;

- higher Kv factor;
- inclined position allowed;
- easier to clean, even in the event of compressor burnout;
- better ability to work in extreme environmental conditions;
- no risk to preclude functionality in case of

- underestimation of the capacity in the design phase;
- reliable function even in the absence of pressure in the system;
- lower seizure risks in presence of dirt in the flow;
- possibility of use as a mixing valve.