

90 BAR FILTER DRIER WITH REPLACEABLE SOLID CORE: YOUR SAFE CHOICE



EU Regulation No. 517/2014, known as the F-gas Regulation, aims to limit global warming by reducing the use of refrigerant gases with a high greenhouse effect by 79% by 2030. For this purpose, amongst other intervention measures, the regulation introduced restrictions on the use of fluorinated gases with a high environmental impact in new plants. The best alternatives to these products are the **natural refrigerants** such as CO₂ and moderately flammable HFO A2L refrigerants, capable of guaranteeing good performance and at the same time mitigating global warming.

The CO₂ refrigerant gas (R744) stands out as an **environmentally friendly alternative** to fluorinated refrigerants.

CO₂ is a natural gas, non-toxic and non-flammable, which does not contribute to the depletion of the ozone layer and has an extremely low direct greenhouse effect. Carbon dioxide (CO₂) is also widely available.

With a **high cooling capacity** due to its thermodynamic characteristics, CO₂ offers an optimal energy capacity, especially in cascade or transcritical systems.

CO₂ is a **high pressure refrigerant** for which high operating pressures are required for efficient operation, it follows that the **safety of the system** is certainly a point of attention for the designers.

In this historical context of significant change, Castel positions itself as a partner in supplying technologically advanced products for use with CO₂ (and not only) that make use of approvals and certifications that can guarantee very high safety standards and that can improve system performance developed by companies that have **taken up the challenge** by moving towards increasingly green, zero-impact systems.

The latest product developed by Castel is the **90 bar filter drier with replaceable solid core**.

This standard catalogue product is identified with the part num-

ber 4431E (one cartridge) and 4432E (two cartridges) is available with steel connections from 5/8" to 2.1/8"

90 bar filter driers are sized to withstand the pressure increase in the event a machine stops due to breakdowns or maintenance activities. During these moments, the pressure in the system increases considerably, forcing the technician to carry out maintenance activities quickly, risking not carrying out certain operations in an optimal manner.

If the intervention times were to lengthen, **the pressure inside the system continues to increase** and the risk that the safety valve intervenes is real.

The intervention of the safety valve creates many inconveniences: need to replace the valve that has discharged, restore the refrigerant dispersed during opening, having to justify to third parties the reasons that led to the opening of the safety valve.

Installing a 90 bar filter instead of the more common 62 bar version has a **number of advantages** that every designer should consider:

- During the machine shutdown, the pressure can increase drastically
- Safety valve can open
- Technicians must work quickly, "**dimensioning the system at 90 bar keeps you safe**"

Safety first of all is also guaranteed by the compactness of the filter, which dimensionally is the same as the 62 bar filter. Its dimensions and low weight do not require particular precautions during handling at the time of installation on the system and dedicated brackets or supports are not required as in the

case of other much bulkier and heavier filters on the market.

Castel has carried out an **in-depth study** on the choice of materials and the sizing of the components through the use of CAE technology (Finite Element Analysis software simulator).

These studies are necessary to place on the market **more and more safe and reliable components**.

Considering the pressures involved, the position of the filter in the circuit and the task it must perform, Castel has decided to approve both sizes (one and two cartridges) as risk Category II according to the PED Directive.

The one cartridge model (4431E), considering its volume and pressure rating, would be risk category I, Castel has decided to homologate it in Cat.II to have the following advantages:

- Traceability, all materials are traced by the lot number on the label of each product
- Welding operators and procedures qualified by a Third Party
- Products provided with a Declaration of Conformity

CO₂ applications often create a highly corrosive environment by attacking components most susceptible to oxidation.

For this reason, the materials have been chosen to **withstand the harshest conditions**, for example, the cover tightening bolts are in stainless steel (A4-80).

Other features that distinguish this product are the following:

- Double flange welding
- 100% helium test
- External leakage test at PS
- Hydraulic test: 1.43 x PS
- Burst pressure: 3 x PS (according to UL)
- Cartridges model: 4490/##
- CE; UKCA; UL

Keeping up with changing times is not easy at all.

Castel can accompany you in this moment of transition by providing products that aim for increasingly green and efficient choices, paying attention for the safety of the systems and technicians.

Download the Castel general catalogue, in the GOGREEN section, you will find other interesting products for CO₂ to complement the replaceable core filter driers.

Or, if you are interested in A2L fluids (R32, R290, R600 etc), refer to the Polyhedra line which features a wide range of products suitable for all of today's and tomorrow's refrigerant fluids.

