

Fact Sheet

Safety relief valves

Valves Tightness and Service needs

Tightness of safety valves with rubber O-ring sealings

Rubber O-ring sealings have excellent sealing properties in safety valves, when built in correctly. Compared to harder PTFE sealings and metal sealings, the sealing performance at system pressures close to the set pressure (low differential pressure) are better due to the softer sealing.

Danfoss backpressure dependent safety relief valves are 100% tightness tested at the end of production line according to DS/EN ISO 21922:2021. The maximum allowable leakage rate is tested in a bubble immersion test according to API 527 using air at 20 °C pressurized to 90% of the set pressure. This is equivalent to the tightness test by means of either technique C.1 or C.2 according to EN 1779:2001, whereas the minimum detectable leakage is 10^{-4} Pa m³/s. This equates the maximum leakage from a safety relief valve to be 10^{-4} Pa m³/s.

In addition, the O-ring material is permeable, meaning that ammonia will permeate by diffusion even the valve sealing is 100% mechanically tight.

Due to the requirement of a downstream piping systems according to EN 13136:2013 ammonia will be accumulated over time in the discharge piping system. Even very small amount of ammonia will be detectable by smell, litmus paper or an ammonia gas detector. However, this does not necessarily indicate the presence of a malfunctioning O-ring sealing.

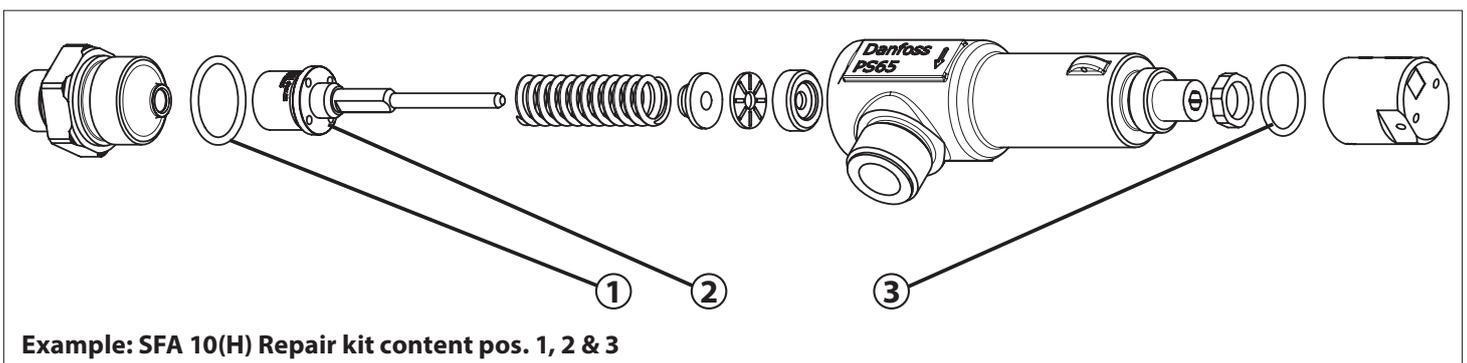
Service intervals

The properties of rubber O-rings are degrading over time and is highly impacted by the long-term temperature exposure. It means O-rings are a wearing part and subject to replacement using Danfoss repair kits or by replacing the complete valve. Danfoss recommends customers to do this when the valve is due for replacement or recalibration as required by local regulation. Observe, the re-calibration shall be done by an authorized party before re-commissioning.

When exposed to long-term temperatures close to the limitation, the degradation of the O-ring may happen faster than the standard recalibration cycle, therefore an additional replacement of O-rings and recalibration are recommended.

The service can be performed by

- Replacement of the complete SFA/SFV valve by a new one with same set pressure OR
- Replacement of spindle with O-rings using the SFA/SFV repair kits followed by a recalibration



Danfoss A/S

Climate Solutions • danfoss.com • +45 7488 2222

www.danfoss.com

Any information, including, but not limited to information on selection of product, its application or use, product design, weight, dimensions, capacity or any other technical data in product manuals, catalogues descriptions, advertisements, etc. and whether made available in writing, orally, electronically, online or via download, shall be considered informative, and is only binding if and to the extent, explicit reference is made in a quotation or order confirmation. Danfoss cannot accept any responsibility for possible errors in catalogues, brochures, videos and other material. Danfoss reserves the right to alter its products without notice. This also applies to products ordered but not delivered provided that such alterations can be made without changes to form, fit or function of the product.

All trademarks in this material are property of Danfoss A/S or Danfoss group companies. Danfoss and the Danfoss logo are trademarks of Danfoss A/S. All rights reserved.