



As a part of hydraulic units, giant and desiccant air breathers from Stauff are used in a number of applications in mobile and industrial hydraulics.
Images: Stauff

Accessories

Clean oil for productive machines

70 to 80 per cent of all machine failures are caused by contaminated hydraulic oil. Moisture can also lead to unfavourable reactions with the fluid and cause corrosion in the hydraulic reservoir and in the lines. To prevent both these issues, it is practical to install a desiccant air breather on the hydraulic reservoir. In the revised portfolio, Stauff took into account the different areas of application and ambient conditions.

70 to 80 per cent of all machine failures are caused by contaminated hydraulic oil. Moisture can also lead to unfavourable reactions with the fluid and cause corrosion in the hydraulic reservoir and in the lines. To prevent both these issues, it is practical to install a desiccant air breather on the hydraulic reservoir.

In the revised portfolio, Stauff took into account the different areas of application and ambient conditions.

Hydraulic systems “breathe”. The level of the hydraulic oil in the reservoir rises and falls during operation. To avoid overpressure or underpressure in the closed circuit, air has to be able to escape through an opening and flow back in again.

This process, however, can allow moisture and dirt to enter into the system. Desiccant air breathers installed on the reservoir opening have two functions: They filter out contamination and absorb moisture.

What does a desiccant air breather have to do?

There are different requirements for desiccant air breathers depending on the area of application and the ambient conditions. In mobile work machines, they have to be particularly robust and vibration-resistant. While things are a bit calmer in stationary systems, there is often less space available, so that the protection for the hydraulic reservoir cannot take up too much room. In other cases, it might be crucial that a particularly cost-effective desiccant air breather can be easily replaced by untrained personnel in a few simple steps. For these different requirements, the Stauff hydraulic accessories offer three series, each in turn with many different variants and specifications.

Each desiccant air breather is an assembly that contains filter elements and drying materials for filtering out dirt particles and binding the moisture in the air. The

The desiccant material consists of 25 % silica gel and 75 % molecular sieve.
Image: Stauff



principle is always the same: An initial filter layer separates out the solid particles. The pre-cleaned air flows through a capsule with desiccant before it is then “fine” filtered and discharged into the hydraulic reservoir. The different series in the Stauff desiccant air breather range all have the same water absorption capacity.

The flagship among desiccant air breathers

The key feature of the particularly robust and sturdy SDB series is a central stainless steel tube. It is positioned in the centre of the assembly and allows the breather to be used even in the most adverse conditions, for example strong vibrations. This central tube is surrounded by a transparent housing made of UV-resistant polycarbon-

ate which contains the desiccant, embedded between two filter discs: 25 % silica gel and 75 % molecular sieve.

The stainless steel tube not only absorbs vibrations or impact from stones or similar objects.

It is also embedded at the centre of the assembly in such a way that no desiccant could get into the hydraulic reservoir even if the housing was damaged.

The flagship in the Stauff range can be equipped with check valves. They separate the desiccant from the ambient air while no air flows in or out. So when the system is idle, no humidity is absorbed from the air, increasing the service life of the desiccant.

Where can such extreme conditions be expected?

In large stone crushing systems, in the mining industry or other areas of mobile hydraulics where large gear-boxes and engines generate strong vibrations. But the SDB series is also used where maintenance intervals have to be reduced significantly, for example in wind turbines.

The compact all-rounder

The compact SDBL series was developed for stationary systems and construction or agricultural machines that are used in complex, but less extreme conditions.

An inner stainless steel tube is not required here. The plastic housing is impact resistant and shock resistant and has a female BSP thread.

The series offers many features that are also available on the high-end SDB models, such as easy replacement of the desiccant or optional use of check valves.

The crucial difference compared to the robust version is, however: The SDBL series has a female thread and the air filter element is not positioned on, but within the assembly. This makes these breathers shorter and allows them to be used even if there is only little space available above the oil reservoir. Users can easily screw on additional accessories, such as an oil mist separator, without changing the height of the system. The female thread offers many adaptation options, which is we call it an “all-rounder”.

A simple version is sufficient if the strain on the unit is low.

The third series – SVDB – is the simplest design: It has a solid plastic housing similar to the SDBL models.

Part of it for 20 years – desiccant air breathers in the Stauff portfolio

Desiccant air breathers are not new in the Stauff portfolio. They have been a part of the hydraulic accessories range from the outset, when it was launched in 1999. Ralf Hartmann has been with the company almost as long. He is a development engineer for hydraulic accessories at Stauff Germany in Werdohl.

Mr Hartmann, what role do desiccant air breathers play in the Stauff portfolio?

Ralf Hartmann: The desiccant air breathers were initially more of a secondary product when the hydraulic accessories range was launched in 1999. We have recently seen the demand for desiccant air breathers increase, which prompted us to expand our range in this area. On our blog, we have dedicated an informative 21-part video series to this topic.

We are recognising the key role of dehumidification when it comes to

the safety and stable availability of hydraulic system.

Why are “simple” breathers for hydraulic reservoirs no longer enough for the manufacturers of hydraulic machines?

One reason is the complexity of the machines. The moisture tolerance is lower, which has made manufacturers and users more sensitive to this issue.

Some of the components have become more sensitive as well. In addition, people expect a high level of reliability from their machines. They want to extend the maintenance cycles and minimise downtime due to malfunctions or repairs. Contamination and premature ageing of the hydraulic oil caused by moisture are the most frequent triggers for machine failure. As the ventilation of the hydraulic tank is the main point of ingress for moist air, it makes sense to equip them with desiccant air breathers.



The desiccant element, however, is seated in a cover that cannot be removed and therefore not replaced. The model SDVB is designed for low strain or for simple applications. It can be replaced as a whole even by untrained personnel.

Absorbing moisture and avoiding damage

What damage can moist air in the hydraulic system cause? If air enters into the hydraulic reservoir and cools down, its inherent moisture will condense on the surface of the reservoir. This can occur even at low temperature differences. The corrosion releases particles that contaminate the hydraulic oil and damage components in the system through abrasion. This is compounded by hydrolysis, which also changes the consistency of the hydraulic oil itself: The oil ages more quickly and loses compressibility.

Another unfavourable effect is that elastomers – which is what the seals in the system are made of – can

swell when they come into contact with oil that contains water. This results in leaks in the system. In short: If hydraulic oil comes into contact with water, it has to be changed more frequently.

The costs of an oil change go far beyond the price of the hydraulic oil: The machines have to be shut down, and the used oil has to be removed and disposed of properly. The complete system is cleaned and serviced, which includes checking the fasteners and seals and replacing them if necessary. To make best possible use of the service life of the hydraulic oil as stated by the manufacturer and to avoid any additional expenditures, the opening of the hydraulic reservoir should be equipped with a desiccant air breather. This allows users – or their service providers – to substantially reduce the level of maintenance work while resting assured that the “breathing” has no negative impact on the availability of the mobile machine.

rso ■

Left: The key feature of the particularly robust and sturdy SDB series is a central stainless steel tube.

Centre: The compact SDBL series was developed for stationary systems in construction or agricultural machinery. An inner stainless steel tube is not required here.

Right: The SDB flagship shows its strength in mobile hydraulics where large gearboxes and motors generate strong vibrations.
Images: Stauff