

Technical Information TI-Z10 Auto-Bleeder EM MEA-4

Purpose

Even though every hydraulic specialist knows that each installation is to be bled carefully after final assembly, there are over and over again seal damages that occur which can be identified as a result of combustion processes within the pressure chamber (Diesel effect). On lip seals you can see those as cracks in the seals along the bottom of the seal groove (see picture) which start at the groove making its way all the way through to the back of the seal. On seals damaged in such a way you can regularly notice a burnt smell, sometimes you can also see burn marks on the crack edges.

The metal shaft surface is also often damaged (see picture). You can find scratches in the direction of moving (expansion channels) or impact holes (similar to cavitation).

Other devices, like hydraulic cylinder, are more or less flushed through in each cycle. The remaining air is carried back to the tank where it can be exhausted.

In a Clamping Device, every activation often means that the oil/air column is pushed a little back and forth only in the line. As a result air inclusions will not be removed, they rather enrich themselves at higher positioned places in the form of foam, possibly also within the pressure chamber of the Clamping Device. Depending on the rate of the pressure rise etc. it may come to an ignition point due to compression.

A steep pressure drop is also dangerous, when gas (previously diffused into the seal material under a lot of pressure) is expanded very fast. In this case, the seal material can be damaged from inside.

The usual one-time manual bleeding of the system is not always enough, especially when the supply line to the Clamping Device is vertical and air enrichment is occurring. In this case an auto-bleeder is recommended.

Function

The function of the auto-bleeder is based on the difference of viscosity of oil and air. A piston located in the bore of the housing with defined radial clearance, works with pressure increases and decreases. The piston will open the inlet with increases in the pressure during start-up from zero to over approx. 2 bar. Accumulated air moves out through the clearance around the piston while following fluid, with the higher flow resistance will close the outlet by instantly pushing up the piston.

The outlet stays closed until during pressure decrease, the pressure falls below about 2 bar, then the piston moves down. During the transition the fluid is leaking out. The higher the gas concentration, the slower the pressure decrease will take place. Thereby, the remaining oil-air-foam will be removed from the system.

⚠ To lead the exhausted air and oil to a tank a pipe or hose is necessary in any case.

When properly applied the main cause for early seal failure can be fought effectively.



Fig. 1: Seal damage section view

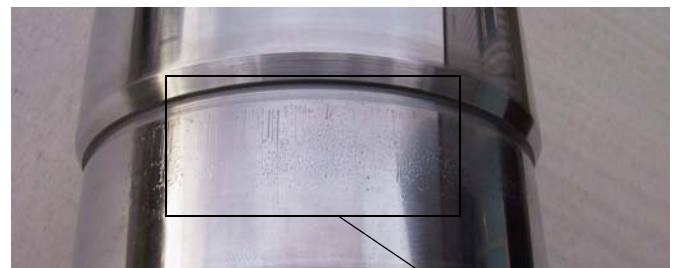


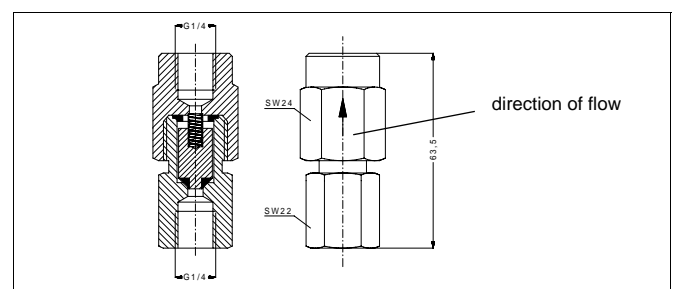
Fig. 2: Damages to sealing surface



The auto-bleeder can not work if the pressure does not fall below approx. 2 bar again. The auto-bleeder will be ineffective if too much back-pressure is constantly in the tank-line.

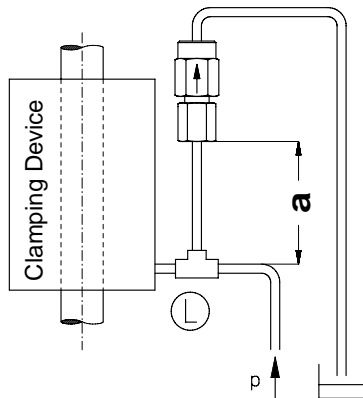
In the case of negative pressure within the hydraulic system, the auto-bleeder works like a check valve, therefore drawing in air is impossible.

The maximum permissible pressure is 400 bar.

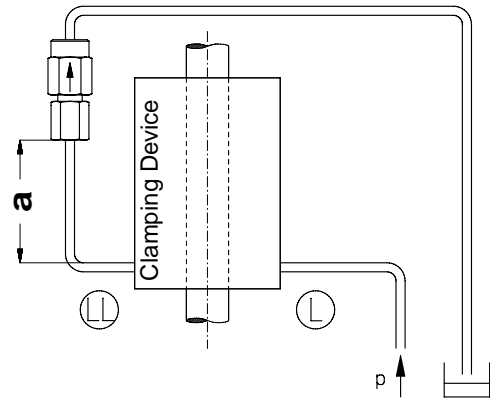


Direction of use

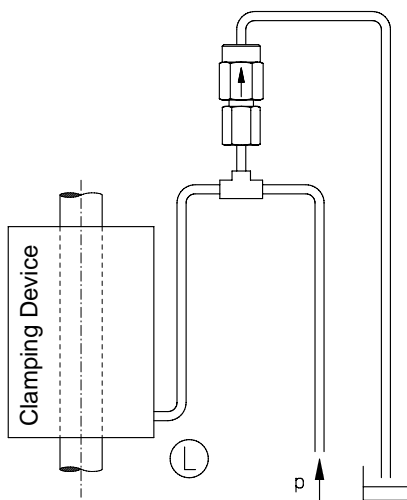
The auto-bleeder is to be installed vertically and above the clamping device with direction of flow pointing up. The pictures show the recommended installation. (Recommendations: $a > 200 \text{ mm}$)



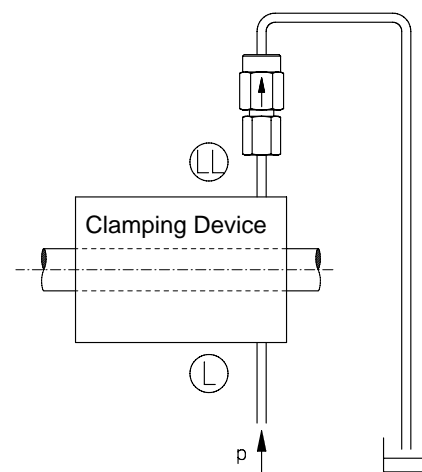
Clamping Device vertical,
 Auto-bleeder at T-piece above port L



Clamping Device vertical,
 Auto-bleeder at T-piece above port LL



Clamping Device vertical or horizontal, Vertical pressure supply line above high located arc, Auto-bleeder at T-piece above highest point.



Clamping Device horizontal,
 Port L possibly below or horizontal,
 Port LL above Auto-bleeder over port LL

Clamping devices with 2 pressure connections (KB-types) need a second auto-bleeder for port K in the same way described above for port L.