

Relaxing with compressed air

Construction and function of a pneumatic glassmaker's bench



Figure 1: Glassmaker's bench with glassmaker's pipe and compressed air hose

Especially in Corona times, team glassmaking has become quite problematic. The use of the glassmaker's pipe by more than one person in the team, especially in relation to the pipe mouthpiece, increases the risk of infection and should therefore be refrained from at present.

One solution to the problem can be to supply the glassmaker's pipe

with compressed air. This solution has the further advantage that the glass batch, supplied with compressed air by the glassmaker during work via foot pedal, can be observed and precisely influenced at the same time.

The conversion of the glassmaker's bench to compressed air supply is relatively simple as follows:

1. Pressure reducer:

The pneumatic glassmaker's bench (as shown in Figure 1) requires its own compressed air connection with a special pressure reducer that can reduce the compressed air coming from the compressor to very low values. Ideally, the pressure reducer also has a pressure gauge that shows the set pressure (Figure 2).

Ideally, the compressed air should be reduced to a level that corresponds approximately to the pressure of the lungs, i.e. in the range of about 0.2 - 0.5 bar. The exact setting can be made on a glass object that is sufficiently heated and that is to be inflated with the set compressed air. Based on the inflation speed, conclusions can be drawn about the lung pressure or the correct setting, or corrections can be made accordingly.

It is important to avoid setting the air pressure too high. If the setting is too high, it is possible to work longer on the object because the compressed air will then still have an effect even if the glass is somewhat cooler. However, the risk of a glass batch exploding is then very high. With the head in the area of the glass post (you observe the inflation effect), serious injuries can occur in the face and especially in the eyes!

Because of this important safety aspect, it must also be ensured that it is not possible to adjust the compressed air accidentally or undetected by third parties!

2. Coupling the com-



Figure 2: Compressed air reducer with pressure gauge



Figure 3: „Blowpipe Hose Extensions“ a rubber hose with mouthpiece for the glassmaker and coupling element for coupling to the mouthpiece of the glassmaker’s pipe, next to it a compressed air coupling



Figure 4: Compressed air coupling for connecting the hose of the „Blowpipe Hose Extension“ with the compressed air supply

pressed air to the pipe:

The compressed air is connected to the pipe by means of a hose extension to the mouthpiece of the glassmaker's pipe. It consists of an approx. 2 metre long rubber hose, which has a mouthpiece for the glassmaker on one side and an elastic, tubular coupling element on the other side, which can be attached to the mouthpiece of the pipe (Figure 3). This allows the glassmaker to supply the pipe with air remotely from the mouthpiece of the glassmaker's pipe.

In the English-speaking area, this hose extension is called „Blowpipe Hose Extensions“. Such „Blowpipe Hose Extensions“ can be obtained from various companies, preferably in the English-speaking area, e.g. from Steinert Industries Inc., USA (www.steinertindustries.com) or the company Glasstoolbox in GB (<https://www.glasstoolbox.co.uk/>).

In order to be able to work with these blowpipe hose extensions on the glassmaker's bench with compressed air from a compressor, a compressed air coupling must be provided instead of the mouthpi-



Figure 5: Coupling element of the „Blowpipe Hose Extension“ attached to the mouthpiece of the pipe

ece for the glassmaker (see figures 3 and 4). Such compressed air couplings are available in any hardware store.

The coupling element for the glassmaker's pipe (Figure 5) is normally elastic and can thus be used within limits for mouthpieces of different diameters. On the back of the coupling element, the thin compressed air hose is fixed to a swivel-mounted connector. This

connection piece, arranged at a right angle, is also clearly visible in Figure 3. The rotatable bearing ensures that the compressed air hose does not get tangled when the pipe is constantly rotated.

Ideally, separate blowpipe hose extensions should be made for pipes with different mouthpiece diameters. This makes it possible to quickly change the



Figure 6: The compressed air foot pedal

blowpipe hose extensions with the help of the compressed air couplings if a pipe with a different mouthpiece diameter is to be used.

3. Foot pedal

The foot pedal (Figure 6) can be used to apply compressed air to the pipe. When the pedal is pressed, compressed air is supplied to the coupled pipe. When the pedal is released, the compressed air line should be vented. Without ventilation, the air pressure would continue to inflate the glass post, even though the foot pedal has already been put back. Only with ventilation can you work in a very targeted way.

The pedal must have two switching positions and should have a spring return so that when you take your foot off, it returns to the initial position on its own (3/2, non-locking, closed, monostable). The foot valve from FESTO is well suited: Foot valve F-3-1/4-B, part number: 8984, supplier: Fa. Landefeld (to be researched under FESTO, foot valve F-3-1/4-B, landing field), <https://www.landefeld.de/artikel/de/f-3-14-b-8984-fussventil/OT-FESTO012060>, <https://www.>



Figure 7: L-threaded grommets for connecting the compressed air hoses to the foot pedal

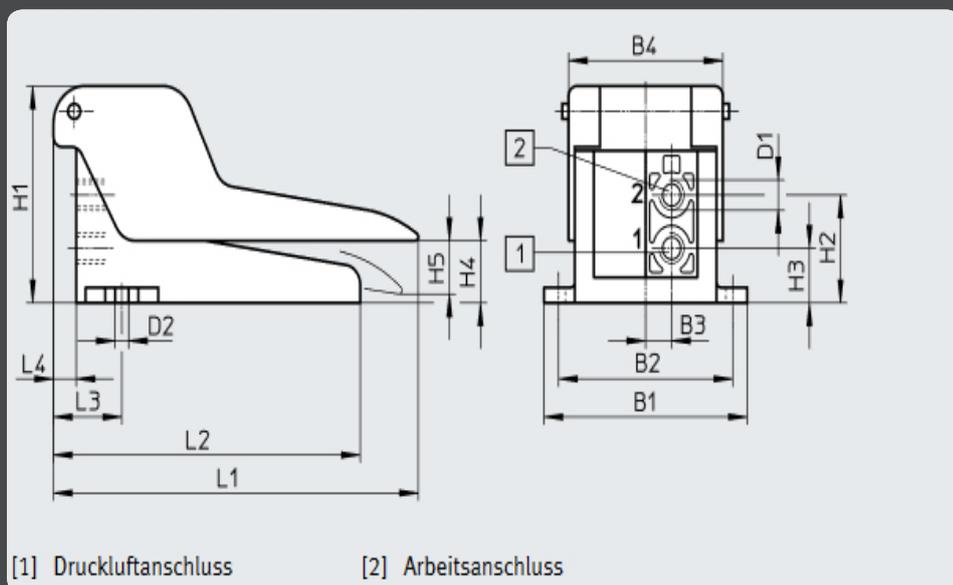
[landefeld.de/shop/media/festo/datenblaetter/8984_de.pdf](https://www.landefeld.de/shop/media/festo/datenblaetter/8984_de.pdf).

The foot pedal has three compressed air connections.

The compressed air is connected to port [1], port [2] goes to the

glassmaker's pipe, port [3] (under the foot pedal) is fitted with a silencer and is used for ventilation.

When getting the foot pedal, note that two threaded grommets (threaded grommets G1/4) are also necessary for connecting the compressed air hoses. If the foot pedal is placed as shown in figure 6, i.e. if the compressed air hoses are to run at right angles to the foot pedal, the threaded grommets must have a right angle in relation to the thread (L-threaded grommets G1/4). Figure 7 shows such L-threaded grommets. When ordering, the inner diameter of the compressed air hoses must also be specified. As a rule, 9 mm should be used. The silencer for



[1] Druckluftanschluss

[2] Arbeitsanschluss

Figure 8: Technical drawing of the foot pedal showing the compressed air connection [1] and the working connection [2] to the pipe.

connection [3] of the foot pedal is usually already pre-mounted in the foot pedal.

For a better understanding, a technical drawing from FESTO is shown in Figure 8. In this drawing, in particular, the compressed air connection [1] and the working connection [2] can also be seen. The threaded grommets required for the compressed air hoses are to be screwed in here.

Figure 9 shows a container with four compartments on the glassmaker's bench, in which various compressed air hoses can be stored. This makes it relatively easy for the glassmaker to select and exchange the compressed air hose required for the glassmaker's pipe being worked on from the glassmaker's bench.

Figure 10 shows a clear overview of all the elements of the pneumatic glassmaker's bench. As explained, they consist of pressure reducer, foot pedal, blowpipe hose extension as well as coupling elements and connecting hoses. 4.

4. Compressor

Glassmaking workshops are usually equipped with compressors,



Figure 9: Box with four compartments for different „Blowpipe Hose Extensions

which makes it easy to add compressed air support to the glassmaking bench. However, especially for hotshops of the studio glass movement, which often have to cope with spartan equipment, it cannot be ruled out that no compressor is available. Since the compressed air supply for the glassmaker's pipe, at very low air pressure, does not require too large quantities of air either, in this case the gap can

be closed with a mini compressor. The range of small compressors is relatively large, and the prices are usually affordable. When buying, however, a few specifications should be taken into account, namely

- that the compressor has a compressed air tank as a buffer storage (for mini compressors usually one with a volume of six litres),
- that it automatically



Figure. 10: Illustration of all elements of the pneumatic glassmaker's bench

refills the compressed air tank when it reaches a certain level of emptiness (this function is fulfilled by almost all of them),

- that it has a delivery capacity of over 100 litres per minute,
- it is equipped with at least one compressed air pressure gauge, and
- that the compressor's volume is tolerable, i.e. less than 80 decibels.

Especially with regard to the loudness of the compressor, it should be noted that 6 decibels (dB) means a doubling of the loudness. A compressor with 86 dB is therefore twice as loud as one with 80 dB.

If the maximum pressure is 8 bar, it is preferable to one with 6 bar, because it then has a little more reserve from the pressure tank.

Figure 11 shows such a mini compressor. It is particularly suitable for the task at hand because it not only fulfils the above-mentioned requirements, but also has two compressed air connections, one of which is directly decoupled from the compressed air tank and thus provides



Figure. 11: Mini compressor with two compressed air connections

the maximum pressure available in each case, but also provides a second compressed air connection which has a preset pressure via a pressure reducer, which sensibly corresponds to the pressure required to supply the glassmaker's pipe. The pressure reducer is able to reduce the pressure continuously down to zero. It is therefore also possible to set the desired pressure in the range of 0.2 - 0.5 bar directly on the compressor. The pressure reducer shown in figure 2 is therefore unnecessary.

The correct function of the compressed air supply can easily be tested with a rubber balloon at the end of a glassmaker's pipe after all functional elements

have been assembled. If you press the pedal, the rubber balloon is inflated. When you take your foot off, it is vented and the air goes out of the rubber balloon. This is how it should work when making glass.

5. Fazit:

It is very interesting that after only a short time of using the compressed air equipment described here, people very quickly start to wonder why they did not provide for this ease of work earlier.

The use of the tips mentioned is at your own risk. No liability whatsoever is accepted for any damage.

Text/Foto Hajo Mück