

## 1. Description

The pneumatic swivel unit is a high performance tool designed for swivel and feed operations in the construction of jigs and fixtures. It is composed of a pneumatic cylinder, a metal housing with attachment options on all sides and an arm for holding the object to be swivelled.

During the swivel movement, in order to amplify the force, the pneumatic cylinder presses onto an integrated toggle level joint which in turn controls the arm's movement. The position control for the arm is realised by means of limit switches integrated in the housing. For stopping the swivel movement, the pneumatic cylinder is equipped with an integrated stop buffer.

## 2. Safety

The pneumatic swivel unit is not designed as a complete tool ready to be used, and therefore it is not equipped with its own safety equipment. Only when it is correctly installed in a production system, and a corresponding safety control system is added, will all the safety requirements be met.

Should any fault occur which places personnel at risk the swivel unit is to be switched off immediately. Maintenance work is only to be carried out when the machine is at a complete standstill and by suitably qualified specialists.

After maintenance work has been carried, out the protection devices are to be refitted in the correct way.

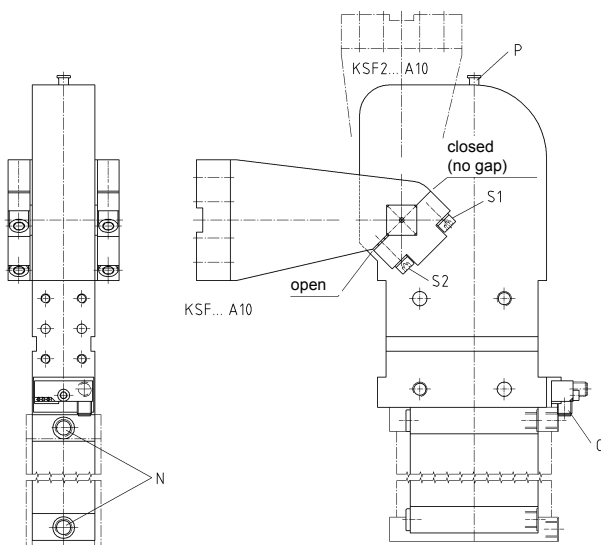


Fig. 1: Principle of operation of the swivel unit

## 3. Installation of the swivel unit

- The swivel unit must be fitted to a sufficiently dimensioned support, where also the dynamic loads of the moving system have been considered. The attachment is carried out using cylinder head screws, the positioning is made using two dowel pins on either the front or the back of the swivel unit.
- Connect the compressed air supply between pneumatic control and the swivel unit (connection "N").

For buffering the return stroke (out and back) external throttled check valves must be used and adjusted to the corresponding speed of motion.

### Caution:

Moving heavy arms/contour pieces too fast can cause mechanical damage to the cylinder floor.

Do not allow the cycle time to drop below the minimum (2 sec. for opening / 2 sec. for closing). The guidelines for the maximum arm weight must be adhered to (see technical data sheet)!

## 4. Adjustment of the swivel unit

### Caution! Danger of crushing!

When the arm is being set, fingers could be severed or crushed! Do not reach into the swivel area while the swivel unit is in operation! Before any operation is commenced in the tool area the compressed air supply must be interrupted first!

Before making an adjustment with the installed swivelling application it must be secured by a suitable load suspension device.

The pivoting moment is being transferred by a high-capacity locking plate with groove and key from the bolt to the swivel traverse. The installation position is adjusted to  $\pm 10'$  in the end position at delivery. If possible this connection should not be loosened again. The adjustment of the swivel unit should be made using suitable shims.

- Screw the feed unit to the holder arm.
- Close swivel unit. Move the toggle lever joint into a position past dead centre until it locks audibly. Now the locking pin "P" is in the out position.
- Measure the dimensional difference between the work piece and the swivel unit.
- Compensate the difference by adding suitable shims.

## 5. Modification of the opening angle

Modification of the opening angle can only be carried out by the service staff of TÜNKERS® Maschinenbau GmbH by replacing the cylinder tube and the tie rods. The proximity switch on the limit switch cartridge must also be set corresponding to the new opening angle.

### Inductive query (T12)

Connect electro-coupling corresponding to the electrical design (see wiring diagram figure 2) onto the connection plug "C" and tighten the screws.

**Caution:** Operation using the wrong or an excessive voltage can lead to a short circuit and injury to personnel.

The function control of the integrated LEDs is as follows:

green ..... operating voltage  
yellow ..... unit is opened  
red ..... unit is closed

## 6. Replacement of the swivel arm

In order to avoid warping of the square-section shaft at the drive shaft, it must be ensured when exchanging or retooling the swivel arm, that fixing screw "S1" (flange contact surface) is tightened first, followed by the second fixing screw "S2" (see figure 1).

Recommended tightening torque for KSF 63 and KSF 80 = 72 Nm

## 7. Unlocking the swivel unit

When the toggle lever joint is in a position beyond dead centre the swivel unit may be mechanically unlocked and thereby opened by the locking pin "P".

**Caution! Danger of crushing!** When handling the locking pin "P" the swivel arm can open abruptly. Do not reach into the swivel range of the swivel arm!

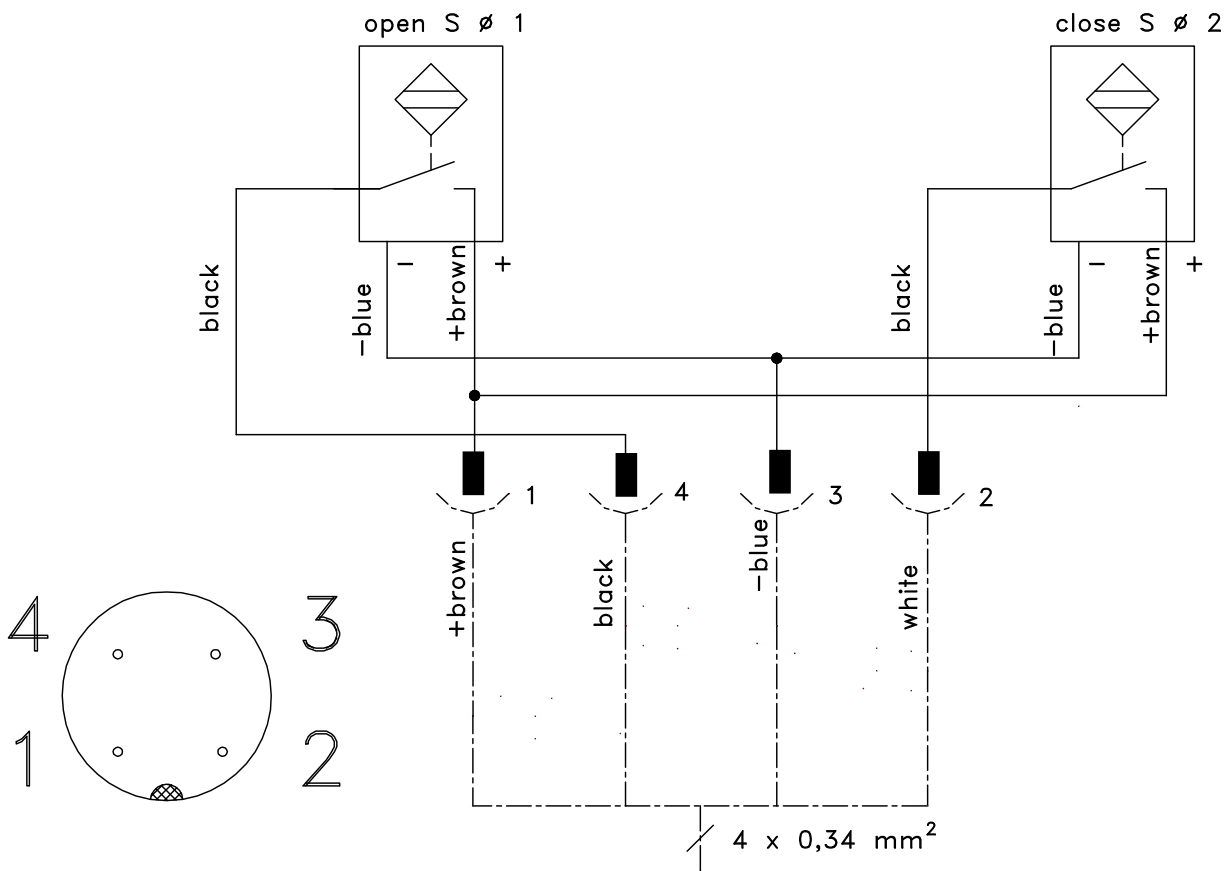
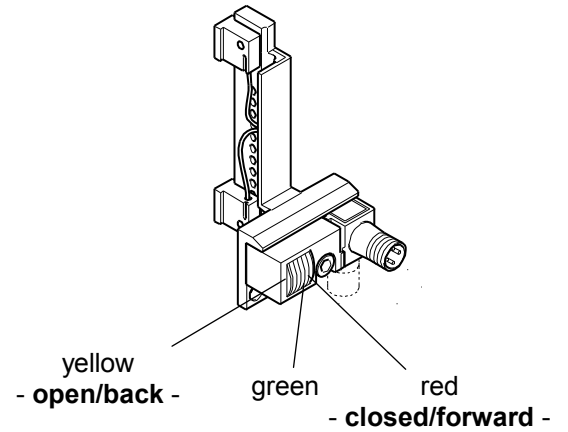
## 8. Replacement of the limit switch cartridge

- Dismantle the limit switch cartridge by loosening the screws.
- Set the new limit switch cartridge to the required opening angle and install it.

## 9. Maintenance

The pneumatic swivel unit is equipped with low-maintenance bearings and guides so that it can be used for large-scale serial production. The technical design of the swivel unit allows a service life of 2 million operating cycles without noticeable wear.

**Caution:** The housing is a fully-encapsulated design to protect the swivel unit from welding spatter. Therefore no special maintenance is necessary. However, damage can be caused to the swivel unit by cleaning with a steam jet or dry ice.



**Technical Specifications**

Inductive switch (Standard version)

Short circuit proof

Rated voltage 10-30 V

Working current 32 mA ( one initiator connected with PLC)

Closer PNP exit

