

1. Description

The pneumatic welding clamp is a high-power tool designed for use in welding tasks processing sheet metal. It consists of a pneumatic cylinder (C), a metal housing with integrated toggle mechanism (D), compensator cylinder with mounting faces, front and side (E), and a carrier arm with receiver for the welding tips (F).

When used for welding, the pneumatic cylinder functions on an integrated toggle lever joint and moves the welding arm. Due to a special toggle mechanism the welding clamp generates a constant high force on a stroke \times app. 5°. The position control of the carrier arm is achieved through limit switches fixed on an integrated cassette system.

2. Safety

The welding clamp was not conceived to be a complete tool, ready for independent applications and has therefore not been fitted with safety equipment. Only when it is correctly installed in a production system and a corresponding safety control system is added, will all safety requirements be met.

Should any faults occur that place personnel at risk, the welding clamp is to be switched off immediately. Maintenance measures are only to be undertaken 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.

3. Assembly of the welding-clamp

- The clamp is installed by means of four socket head cap screws and dowels on the mounting face, front or side.
- Connect to supply air between pneumatic control valve and clamp (connections "N").

Caution: For fine adjustment of speed of clamping process, the use of external directional flow control valves is recommended.

Caution: Moving heavy carrier arms too fast on return stroke can cause damage to the cylinder base. Do not fall short of the minimum cycle time (1 sec. to open / 1 sec. to close). The guidelines for maximum carrier arm weight are to be heeded (see constructional guidelines)!

- Connect proximity position sensors cartridge (G) to control panel.

Caution: Should the volume of air supplied to the cylinder be insufficient, the clamp will close but not achieve the full welding force before the inductive switch gives the signal to weld.

Caution: Operation with incorrect or too high voltage can lead to short-circuiting and danger to personnel. For the 220 V model it is absolutely essential to connect the protective conductor.

The function control of the integrated LEDs T12 is as follows:

Green operating voltage
 Yellow clamp is opened
 Red clamp is closed

4. Set up for the welding-clamp

Caution! Danger of crushing!

When the carrier arm is being set, fingers could be severed or crushed. Do not reach into the swivel area of the carrier arm while the pneumatic clamp is in operation. Before operations are started the air supply must be shut off.

Ensure that the tip extensions and the tips are new and not damaged and that they are mounted correctly onto the clamp.

The lower welding tip (A) should be set at a height of approximately 2 mm above the axis (B) of the carrier arm.

With the tips closed together, the arm should be at approximately 5° before zero, in relationship to the tip axis. This ensures that, although the clamp is achieving its welding force, there is enough free movement in the arm to compensate for wear on the tips.

5. Welding Process Control

When the clamp has reached its welding position the inductive switch will give a signal indicating that it is now permissible to weld.

To ensure that the welding force has been achieved, a delay period of **min. 0,3 seconds** must be given before welding is carried out.

As an option, a pressure switch, working together with the inductive switch, may be fitted into the air system to ensure that the full air pressure has been achieved before the signal to weld is given.

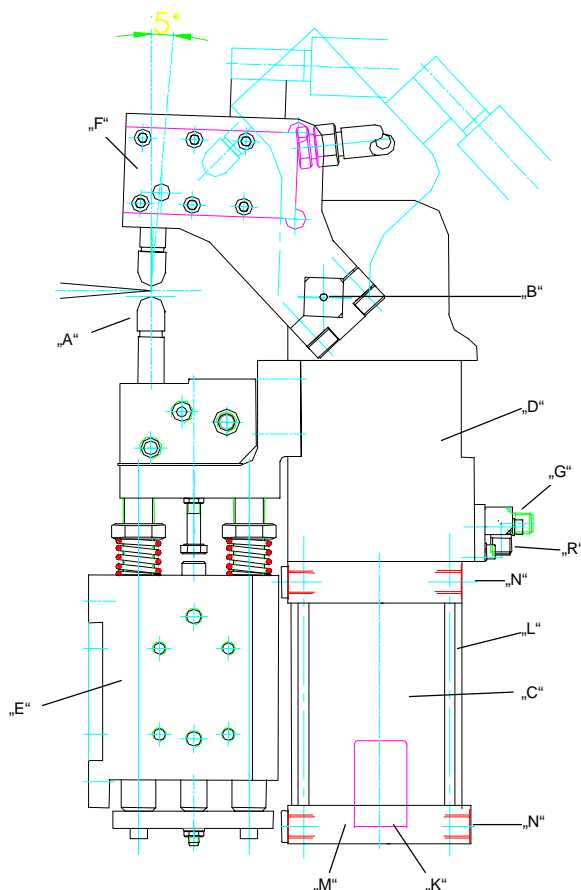
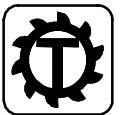


Fig. 1 Welding-Clamp



6. Adjusting the opening angle

The opening angle can be set in phases of 15° each. The smallest opening angle measures 45°, the maximum opening is 90°.

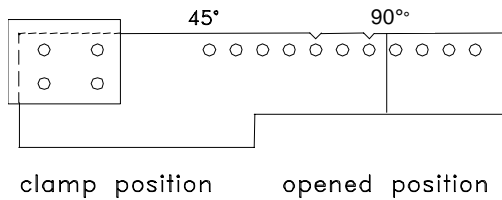


Fig. 2 Limit switch cartridge

For each change to the angle, both the cylinder stop "K" and the limit switches have to be adjusted.

- Release the 4 tension rod screws "L" in the cylinder floor "M".
- Remove the cylinder base "M" and take out the limit stop "K".
- Fit new cylinder stop "K" (polyamide buffer) for desired opening angle in length "X" according to Table 1, in cylinder base "M".

Opening angle carrier arm	Limit stop measurement	
	WS 63	WS 80
45°	56,5	68,5
60°	48,5	59,5
75°	41,0	50,0
90°	32,5	40,5

Table 1: "X" measure

- Secure cylinder base "M" with tension rod screws. Take care that screws are tightened uniformly.
- Remove limit switch cartridge by releasing the screw "R".
- Move lower switch to the position required.
- Remount limit switch cartridge.
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7. Replacement of limit switch cartridge

- Remove limit switch cartridge by releasing the screw "R".
- Set new limit switch cartridge for relevant opening angle (see 6) and assemble.

8. Maintenance

The welding clamp is designed for high production applications; it is equipped with high quality, low-maintenance bearings, seals and guides. Because of the closed structure no special maintenance of the welding clamp is necessary.

Caution: Damage can be caused to the welding clamp by cleaning with steam-jet or dry ice.

