

1. Description

The ALPHA clamp is a high-power tool designed for use in clamping tasks processing sheet metal. It consists of a pneumatic cylinder, a metal housing with several mounting possibilities, and a clamp arm with receiver for the contour piece.

When used for clamping, the pneumatic cylinder functions on an integrated curve mechanism and moves the clamp arm. The position control of the clamp arm is achieved through limit switches fixed on an integrated cassette system.

2. Safety

The ALPHA 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 ALPHA 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 ALPHA clamp

- The clamp is installed by means of socket head cap screws on the mounting face, front or rear.
- Connect to supply air between pneumatic control valve and clamp (connections "N"). Installation of flow control valves is recommended to reduce the clamp opening and closing speed and to adjust to the proper system / line speed

Attention: The ALPHA clamp is equipped with an integrated cushion on the return stroke. At excessive clamp arm weight, the safe function of the cushion is not warranted. Maximum permitted clamp arm weight design guidelines must be adhered to.

A. Inductive Position Sensing (T12)

Connect sensor per electrical diagram to control line by inserting connector "C" and tightening connector coupling nut.

Caution: Operation with wrong current or current higher than specified may short out the system and lead to personnel injury.

Function of the integrated LEDs is as follows:

- greenSystem current
- redClamp closed
- yellow.....Clamp open

* Due to the design a secure signaling "clamp closed" will only be carried out in the angular range of about $\pm 2^\circ$.

B. Clamp arm mounting

The bars of the flange have different heights. Note the alignment of the flange during assembly, see fig. 1 a and 1 b.

Tighten screw "S1" first (no gap between cap and arm body) and then screw "S2" (remaining gap). Use only the supplied fastening elements. Shorter screws will lead to damage of the clamp arm.

Clamp arm versions

A10	A50	A60
M 6 x 16	M 6 x 16	M 6 x 20

Clamp arm in steel version:

Scew 12.9

Tightening torque 8.7 Nm

Conical spring washer DIN 6796-6-FSt.

Clamp arm in aluminum version:

Scew min. 8.8

Tightening torque 8.7 Nm

Conical spring washer DIN 6796-6-FSt.

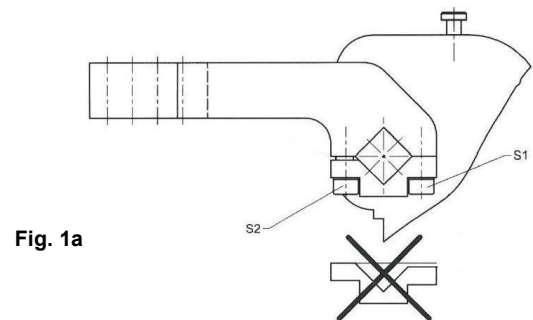


Fig. 1a

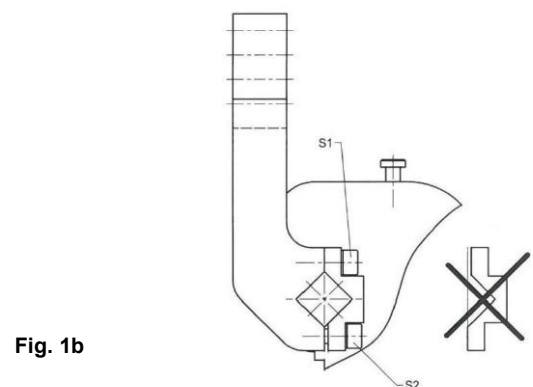


Fig. 1b

4. Set up for the ALPHA clamp

Caution! Danger of crushing!

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

The ALPHA clamp is equipped with a special curve mechanism, which generates a defined clamping force over a clamping angle of $\pm 1,2^\circ$. The contour pieces are to be built so they fit into the work piece in a clamp arm position of 0° and 90° . This ensures a clamping way and so a power reserve in process.

- Tighten contour piece on clamp arm.
 - Close the clamp and check the 0° position with appropriate measuring equipment. If necessary, adjust with shims under the corresponding contour piece. When set correctly, the release pin "P" lifts up slightly from the housing.
- Attention When release pin "P" is fully extended the clamping distance of the ALPHA clamp is exhausted and no more power reserve is available (= release pin "P" is jammed).

ATTENTION: The operating point of the clamp must be within the range of the constant clamping force. Outside this range, the closed position signal may not be available.

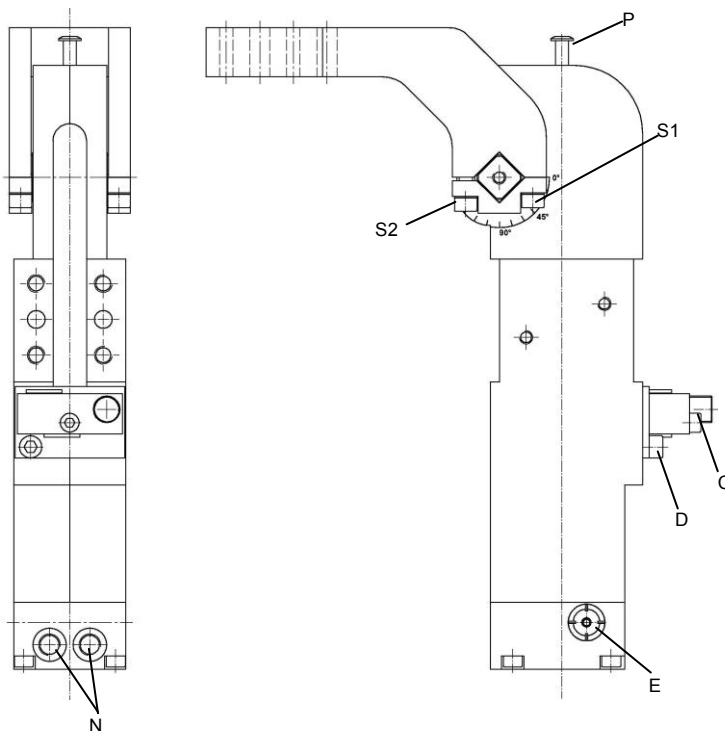


Fig. 2: ALPHA clamp

5. Release of Toggle

When the toggle lever is in the upper dead centre position, the clamp may be mechanically unlocked and thereby opened by operating pin „P“.

In case of air loss, the clamp version APH... H can be unlocked additionally by operating pin "E"

Caution! Danger of crushing!

By operating pin „P“ the clamp arm can open abruptly. Do not reach into the swivel area of the clamp arm!

6. Adjusting the opening angle

The opening angle is steplessly adjustable in the range of 10° to 135° . Changing the opening angle adjusts the pneumatic end of stroke cushion and the position sensors automatically. The standard opening angle is 135° .

Set Up:

- Bring clamp arm to open position.
- Read the pre-adjusted angle at the scale.
- Remove screw "A" in the cylinder bottom.
- Turn screw "B" with the same hexagon key until the desired angle has been reached, adjusting range 10° - 135° (APH2... max. 105°), see scale at the housing.
- Mount screw "A" in the cylinder bottom.

CAUTION: Look out for a correct fastening of screw "B", otherwise the opening angle could be changed by mistake.

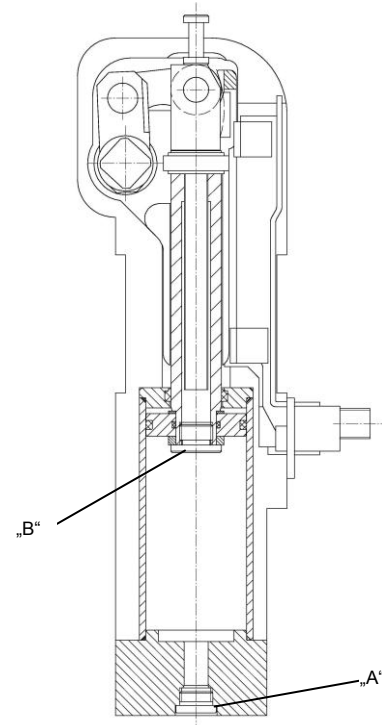


Fig. 3: Adjusting the opening angle

7. Replacement of limit switch cartridge

- Remove limit switch cartridge by releasing the screw "D".

8. Changing of Clamp Arm

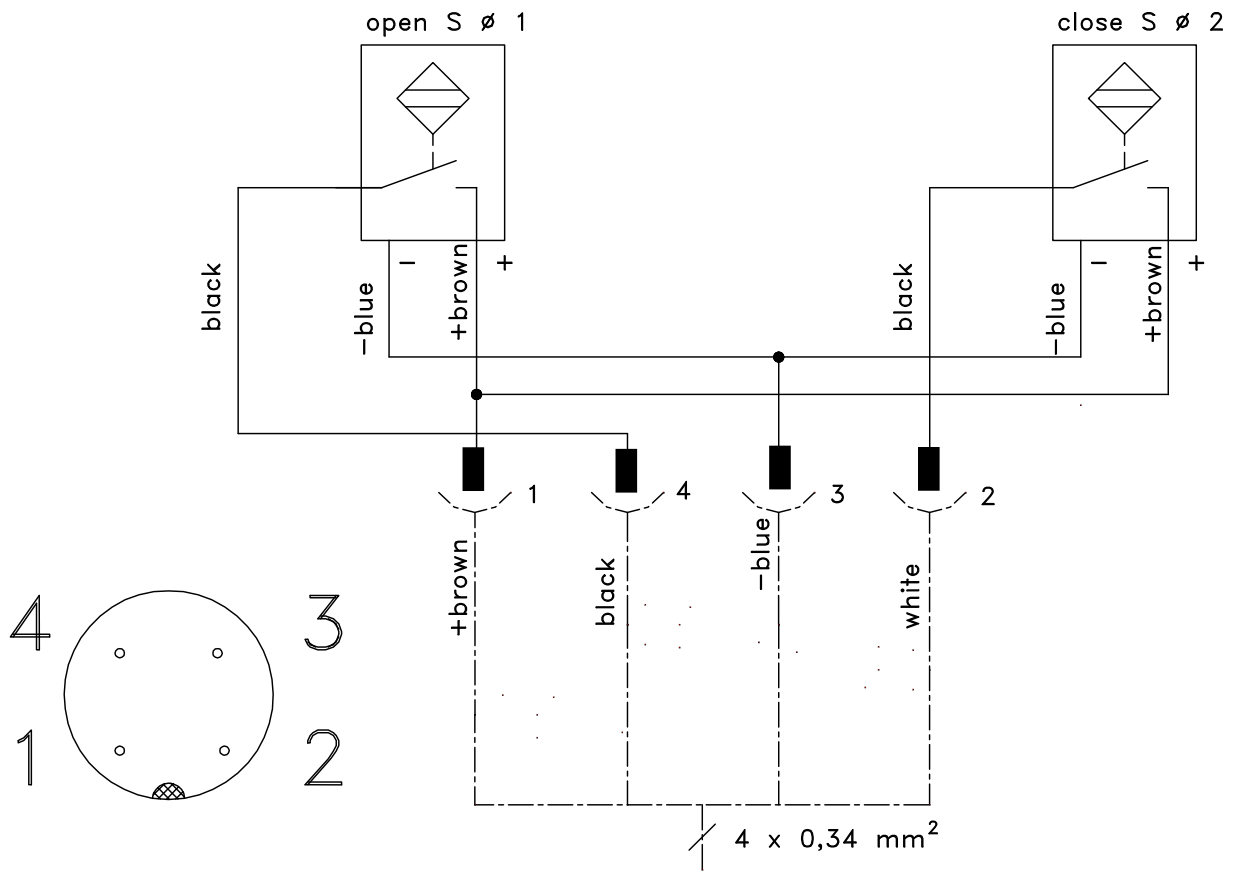
In order to avoid warping of the square-section shaft, it must be ensured when changing the clamp arm that fixing screw "S1" (flange contact surface, clamp arm at stop) is tightened first, followed by the second fixing screw, "S2" (see Figure 2).

Recommended tightening torque: 8.7 Nm

9. Maintenance

Bearings and wear faces on the ALPHA clamp have been designed with consideration for high production applications. This technical concept allows 2 million cycles without significant component wear.

Attention: To provide protection from welding slag and other debris, the clamp is equipped with a fully closed housing. Therefore, no special maintenance is required. Cleaning with high-pressure steam or dry ice may damage the power clamp mechanism.



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

