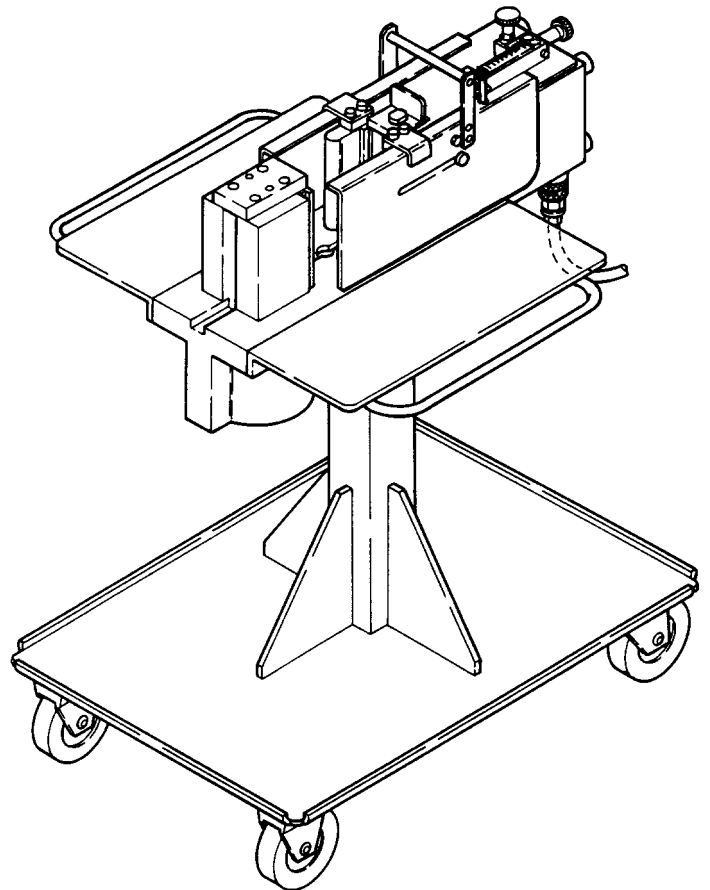
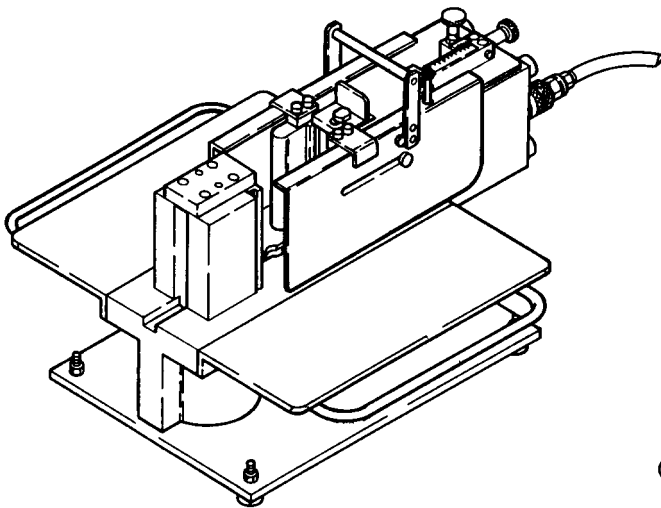


# Operating Manual

for

**NOVOpress**

**CUTTING, PERFORATING, BENDING  
SLB120**



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0896

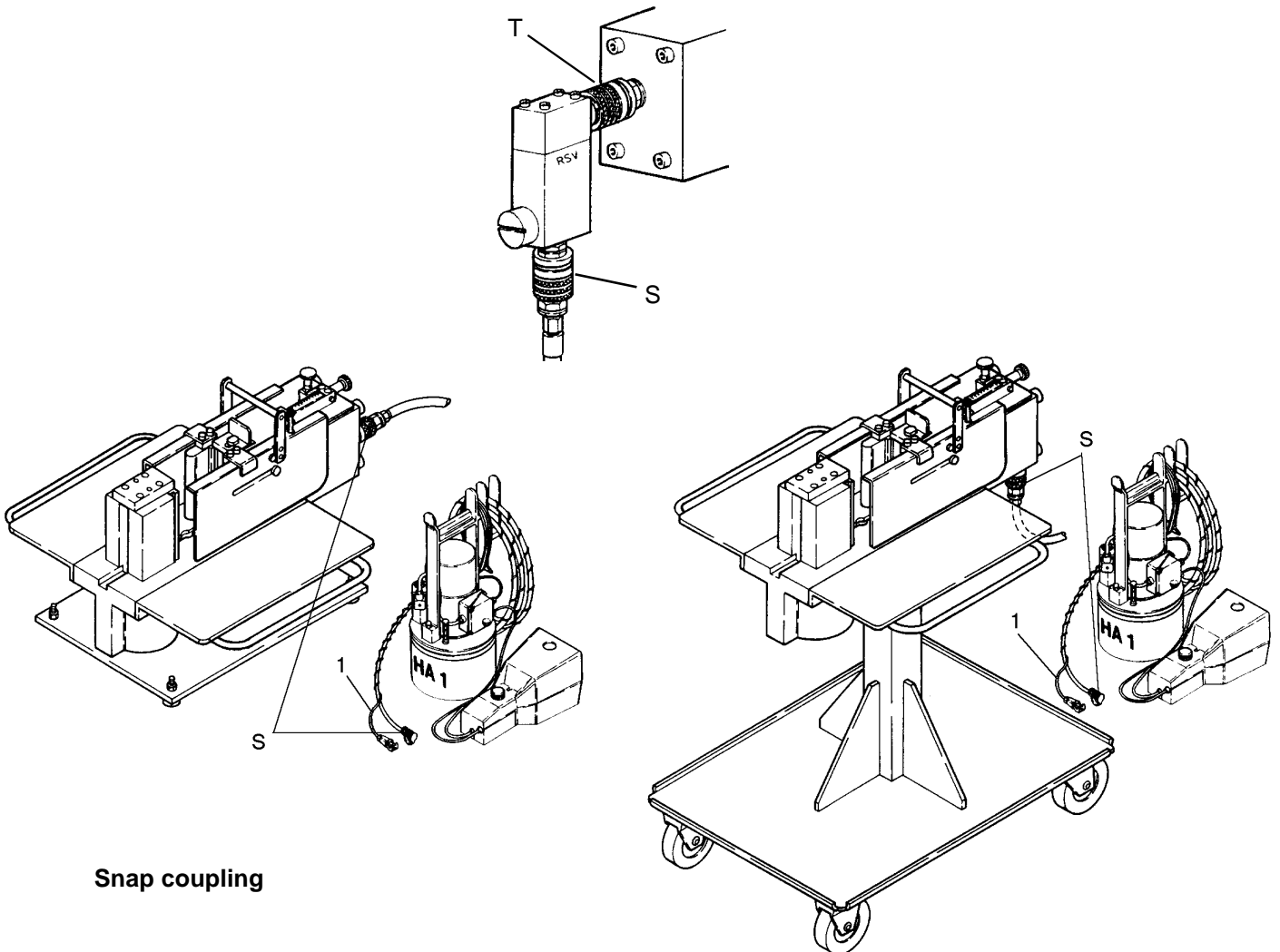
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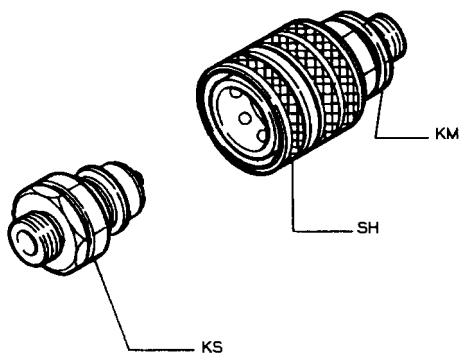


## 4. Commissioning

- Connect the return valve RSV to the SLB 120 using the snap coupling (T).
- Connect the hydraulic unit to the RSV using the snap coupling (S).



### Snap coupling



### Coupling

Hold the coupling body (**KM**) against the sliding sleeve (**SH**) and push onto the coupling plug (**KS**).

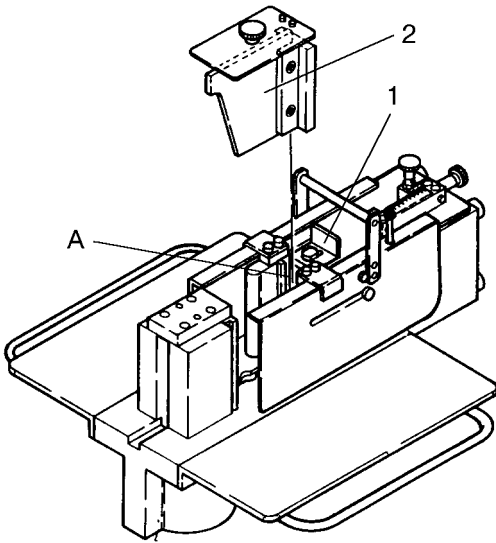
### Uncoupling

Hold the coupling body (**KM**) against the sliding sleeve (**SH**) and pull from the coupling plug (**KS**).

- In order to bleed the hydraulic system, allow the unit to run for a few strokes free of load. During the bleeding operation, the hydraulic unit must be above the working cylinder.

## 5. Cutting

### Installing the blade

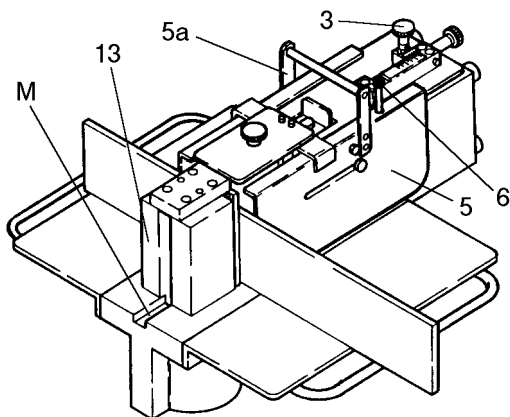


- Push the lock (1) to the rear and hold.
- Insert the blade (2) in guide (A).
- Release the lock (1) and push forwards if necessary.

#### Caution:

*The lock (1) must be in the forward position (starting position); otherwise, the hydraulic unit cannot be switched on.*

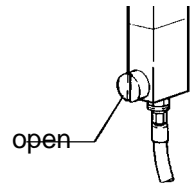
### Cutting



#### Caution:

**The blade guide (M) in the table plate must be kept free of swarf and cutting debris.**

- Open the RSV - the mark on the knob is in a vertical position.
- In order to cut, the indexing bolt (3) must be locked into the V groove. If this is not the case, pull up the indexing bolt (3), rotate through 90° and lock into the V groove.
- Push the safety device (5) backwards until it locks into



position.

- Insert the busbar.
- Hold the safety device (5) steady and push the lever (6) towards the handle (5a). Push back the safety device.

#### Note:

*Cutting cannot be initiated whilst the safety device is in the locked position.*

- Operate the foot-switch and hold until the hydraulic unit switches itself off.

#### Caution:

*The cutting operation is not complete until the hydraulic unit has been switched off.*

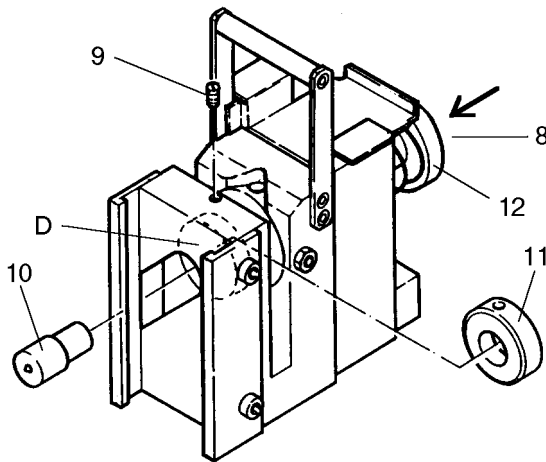
- Release the foot-switch.
- Remove the busbar.
- Remove any cutting debris from the mandrel (13).

## 6. Perforating

### Instructions for using the tools

- **The hole diameter must not be smaller than the thickness of the material.**  
Failure to observe this rule will result in damage to the tool.
- It is **impermissible** to enlarge holes using the **progressive die technique**.  
Similarly, the **minimum distance** between two holes or between a hole and the edge of the busbar must be **at least the thickness of the tool**.  
Failure to observe this rule will result in damage to the tool.
- **Change tools as soon as they become worn.**  
Excess wear on a tool may cause the upper tool to become caught in the workpiece, and it may not be possible to wipe off the workpiece. The tool may be damaged when it is released.
- **Keep tools cleaned and oiled** when not in use.  
The tool life is increased by wetting it with a few drops of oil from time to time.  
Storage of tools:  
The upper tool must **not** be inserted into the lower tool, as this may damage the cutting edges.

### Installing the upper and lower tools



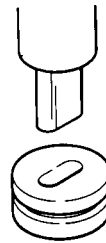
- Push the piston (12) in the direction of the arrow.
- Insert the upper tool (10) through the aperture (D) into the perforating tool.
- Tighten the upper tool (10) using the cheese head screw (8).
- Pull out the piston (12) in the opposite direction to the arrow.
- Insert the lower tool (11) into the aperture (D) as shown in the diagram.
- Secure with the grub screw (9).
- When removing, proceed in the reverse order.

### Profile tools

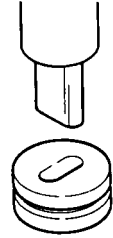
Upper tools have a straight pin on the outer diameter. To align the upper tool, there are 2 grooves in the upper tool holder.

Lower tools have two V grooves on the outer diameter arranged at 90° to one another. When fitting, each V groove (depending on the required perforation or the alignment of the upper tool) must be aligned with the grub screw (9).

**Caution:** When fitting profile tools, it is essential to ensure that the upper and lower tools are properly aligned.

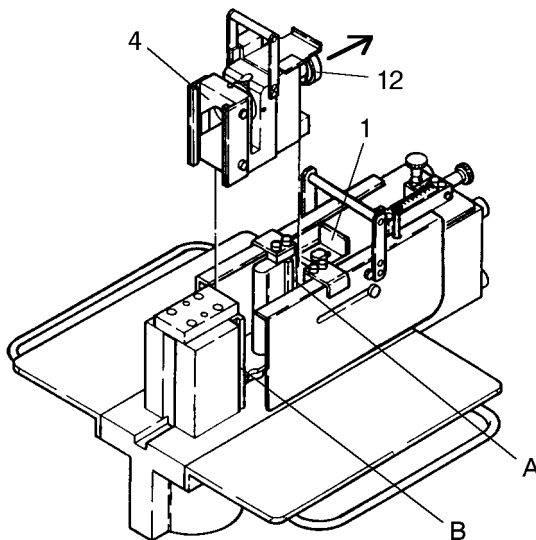


correct



incorrect

### Installing the perforating tool

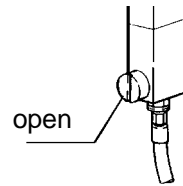
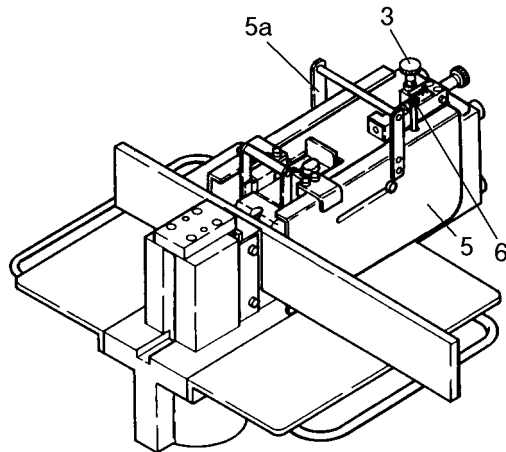


- Push the piston (12) in the direction of the arrow.
- Push the lock (1) to the rear and hold.
- Fit the perforating tool (4) into the guides (A) and (B).
- Release the lock (1).

**Caution:**

*The hydraulic unit cannot be switched on unless the lock (1) is in the forward position (starting position).*

## Perforating without the hole template



- Open the RSV - the marking on the knob is in a vertical position
- In order to perforate, the indexing bolt (3) must be locked into the V groove.  
If this is not the case, pull up the indexing bolt (3), rotate through 90° and lock into the V groove.
- Push the safety device (5) backwards until it locks into position.
- Insert the busbar, which has been centre-marked in readiness.
- Line up the centre marks of the busbar with the centring point of the upper tool and hold in position.
- Hold the safety device (5) steady and push the lever (6) towards the handle (5a). Push back the safety device.

**Note:**

*Perforating cannot be initiated whilst the safety device is in the locked position.*

- Operate the foot-switch and hold until the perforation process is complete.

**Note:**

*After the second perforation, the debris produced should fall away from the perforating tool.  
If this is not the case, remove the perforating debris.*

- Release the foot-switch.
- Take out the busbar.

**Note:**

*When perforating aluminium, the upper tool may become caught in the workpiece. The workpiece is not wiped off.*

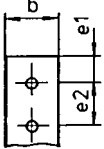
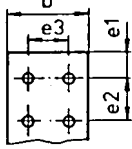
*To prevent this from happening, the upper tool should be greased or oiled.*

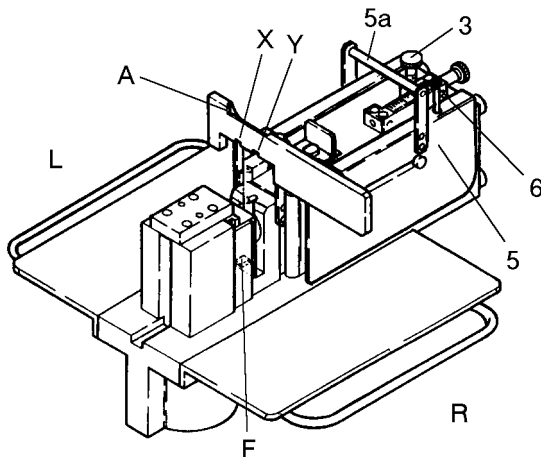


## Perforating with the hole template for DIN perforations

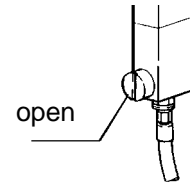
The hole patterns of the hole templates comply with DIN 43673.

The busbar widths and hole patterns for each template can be taken from the following table.

Order no.:	b (mm)	Hole pattern	b (mm)	Hole pattern	e1 (mm)	e2 (mm)	e3 (mm)
31138	40		80		20	40	40
31156	50		100		20	40	40
31184	60		120		20	40	40



1. Open the RSV - the marking on the knob is in a vertical position.
2. In order to perforate, the indexing bolt (3) must be locked into the V groove.  
If this is not the case, pull up the indexing bolt, rotate through 90° and lock into the V groove.
3. Push the safety device (5) backwards until it locks into position.
4. Insert the hole template with groove (X) into the fixing point (F) of the perforating tool.



**Note:**

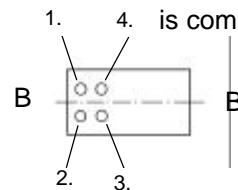
*The hole templates must be inserted as shown. The end stop (A) of the hole template must be located on the left-hand side (L).*

5. Insert the busbar and push it against the template stop.
6. Hold the safety device (5) steady and push the lever (6) towards the handle (5a). Push back the safety device.

**Note:**

*Perforating cannot be initiated whilst the safety device is in the locked position.*

7. Operate the foot-switch and hold until the perforation process is complete.
8. Release the foot-switch.
9. Take out the busbar and rotate it through 180° around the axis B-B.
10. Push the safety device (5) backwards until it locks into position.
11. Insert the busbar and push it against the template stop (A).



12. Hold the safety device (5) steady and push the lever (6) towards the handle (5a). Push back the safety device.

13. Operate the foot-switch and hold until the hydraulic unit switches itself off.

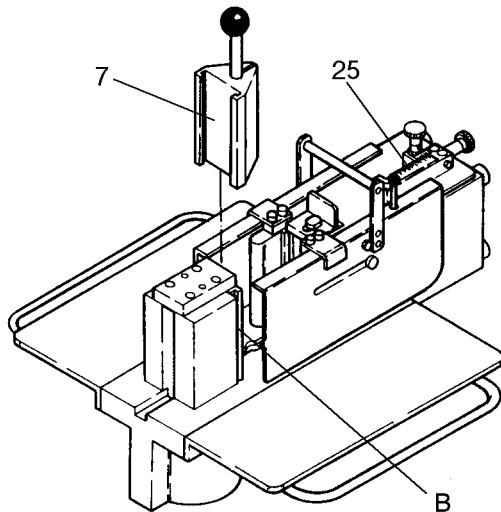
**Note:**

*After the second perforation, the debris produced should fall away from the perforating tool.  
If this is not the case, remove the perforation debris.*

14. Release the foot-switch.
15. Take out the busbar.
16. Push the safety device (5) backwards until it locks into position.
17. Fit the hole template with groove (Y) into the fixing point (F) of the perforating tool.
18. Repeat points 5 to 15.

## 7. Bending

### Installing the bending device



- Insert the bending device (7) into the guide (B).

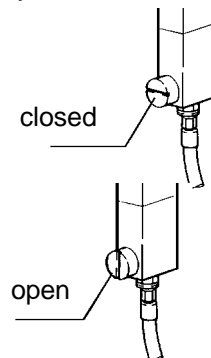
### Bending

The bending angle is adjusted using the stroke limiter (25).

The millimetre scale indicates the amount of forward stroke. To enable precise reading and adjustment, increments of 0.1 to 0.5 mm can be read with the vernier.

The correct settings for the required bending angle should be determined by means of test bends (see table).

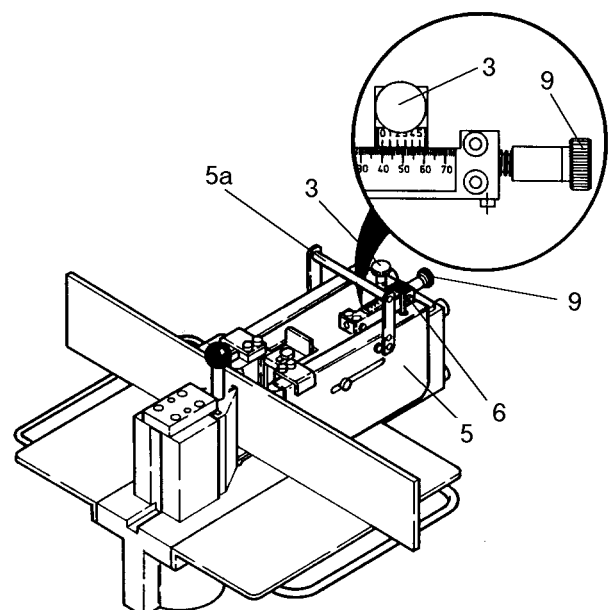
- Close the RSV - the marking on the knob is in a horizontal position. The tool comes to a halt once the bending operation is complete.
- Open the RSV - the marking on the knob is in a vertical position. The tool returns once the bending operation is complete.
- Push the safety device (5) backwards until it locks into position.
- Insert the busbar.
- Establish the shank length.
- Hold the safety device (5) steady and push the lever (6) towards the handle (5a). Push back the safety device.



#### Note:

*Bending cannot be initiated whilst the safety device is in the locked position.*

- Adjust the stroke using the stroke limiter (25).  
Setting example for a stroke of 40 mm:
  - a) For bending, the indexing bolt (3) must be locked into the U groove. If this is not the case, rotate the indexing bolt (3) through 90° and lock into the U groove.
  - b) Rotate the setting knob (9) until the setting is 40 mm.



- c) Press the foot-switch and hold until the hydraulic unit switches itself off.
- d) Take the busbar out of the tool.
- e) Measure the angle of bend.
- f) If the required angle was not achieved, set a larger stroke.
- g) Repeat this procedure until the required angle is achieved.
- h) From then on, all bent busbars made of the same material and with the same dimensions will have the same angle. The angle will not need to be adjusted for these particular busbars.

The following table shows the angle of bend depending on the set stroke.

<b>Copper busbars 120x10</b>		<b>Aluminium busbars 120x10</b>	
Angle of bend	Stroke in mm	Angle of bend	Stroke in mm
15°	approx. 12	15°	approx. 11.5
30°	approx. 16.5	30°	approx. 15.2
45°	approx. 21.5	45°	approx. 20
60°	approx. 26.5	60°	approx. 24.5
75°	approx. 31	75°	approx. 29.5
90°	approx. 36.5	90°	approx. 35

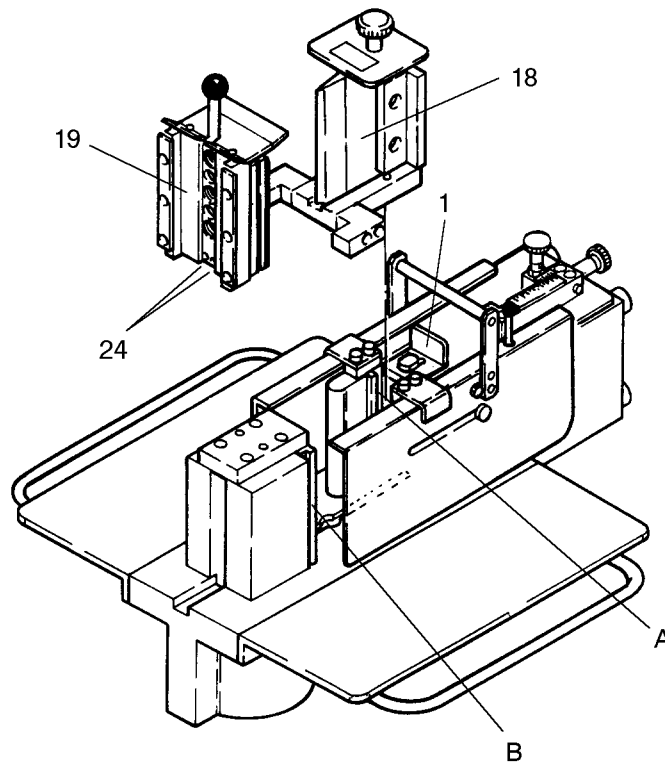
## 8. Lamella cutting set, order no.: 31681

### Applications

The lamella cutting set can be used to cut:

- Lamellar copper busbars: 130 x 10 (insulated)  
130 x 16 (non-insulated)
- Woven copper cables of fine wire: Maximum size for insertion 130 x 16

### Installing the lamella cutting set



**Note:**

*It is important to ensure that the lamella cutting set is installed in the prescribed order.*

- Unscrew the screws (24).
- Push the lock (1) backwards and hold.
- Insert the blade (18) into the guide (A).
- Release the lock (1) and push forwards if necessary.

**Note:**

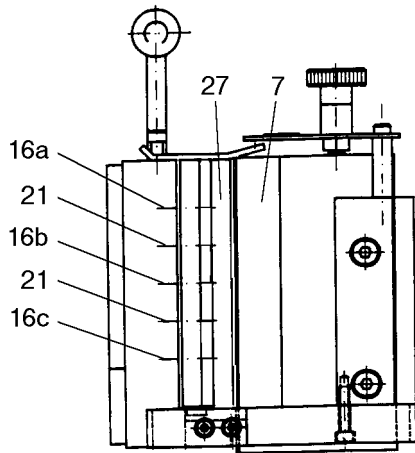
*The lock (1) must be in the forward position (starting position); otherwise, the hydraulic unit cannot be switched on.*

- Insert the clamping pad (19) into the guide (B).

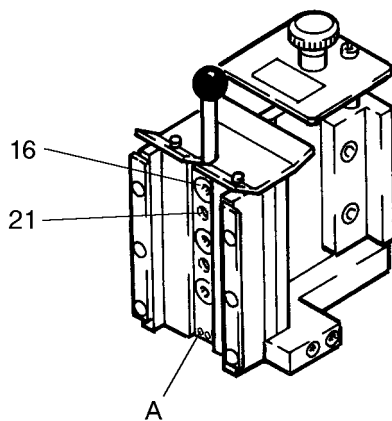
### Cutting

See chapter 5 "Cutting"

## Adjusting the blade



- Loosen the 3 screws (16) and 2 screws (21).
- Place the screws (M6x30) in the holes A and screw the lamella cutting set together.



- There must be a gap between the blade (7) and the clamping pad (27).
- Screw in the screw (16a) until no die clearance is visible at this level between the blade (7) and the clamping pad (27).
- Repeat the above step with screws (16b) and (16c).
- Check the overall die clearance. Tighten up the screws if necessary.
- Tighten the screws (21).

## Unscrew the screws (M6x30)

## 9. Perforating tools for laminated copper and flat bars less than 34 mm wide

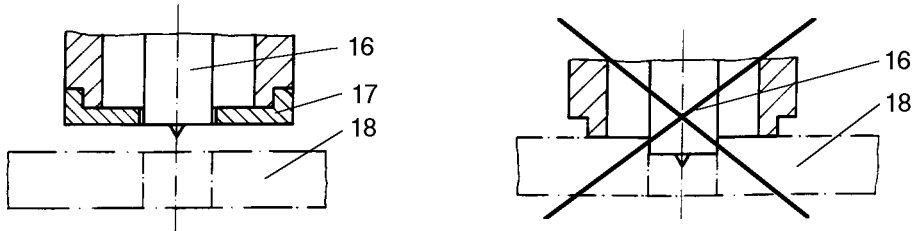
### Applications

Perforating tools with extra wipers must be used for laminated copper and flat bars less than 34 mm wide.

Maximum busbar thickness (non-insulated): up to 10 mm

Each upper tool has a separate extra wiper.

### Long upper tool (bright)



The bright metallic upper tools (16) may only be used in conjunction with the extra wipers (17). These upper tools (16) are longer than the standard black upper tools (19).

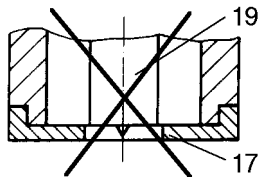
If the bright upper tools (16) are used without the extra wipers (17), the workpiece (18) will become caught on the upper tool and will not be wiped, i.e.

**THE DIE MAY FRACTURE.**

It is essential that the material is insulated before punching.

The thickness of the material without insulation must not exceed a maximum of 10 mm.

### Standard upper tool (black)

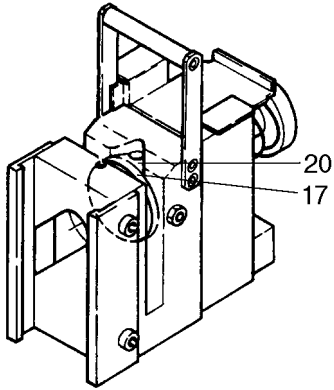


The standard black upper tools (19) should not be used in conjunction with the extra wipers (17) because:

- the centring point is not visible.

**Installing**

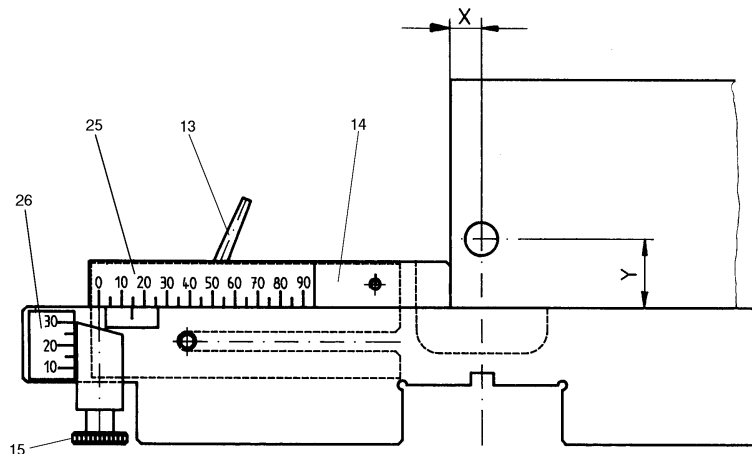
Mount the extra wiper (17) on the holder (20) and press down firmly by hand (caution with the centring point!).

**Removing**

Pull the extra wiper (17) from the holder (20).



## 10. Adjustable template, order no.: 31890, for perforating tool



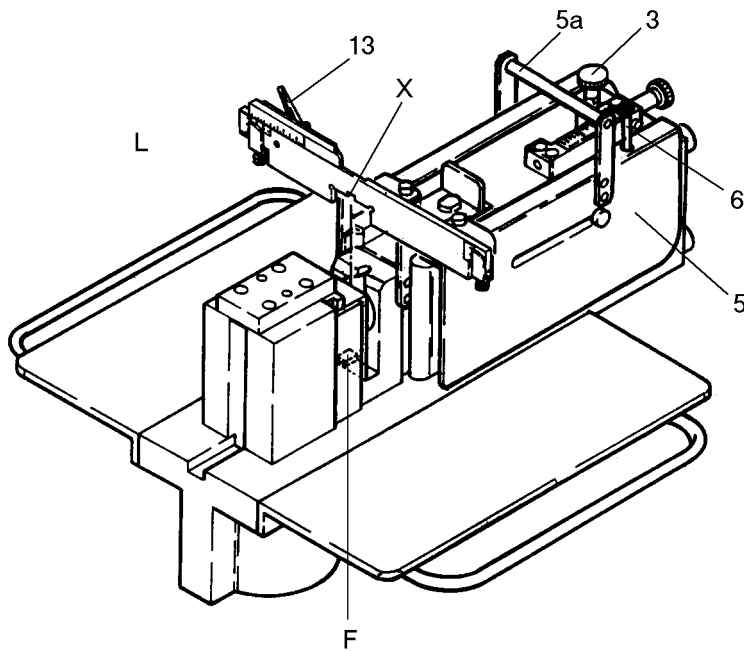
### Adjusting the hole template

The scale on the x axis (25) indicates the distance (X) between the template stop and the centre of the hole to be punched.

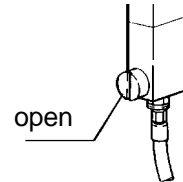
The scales on the y axis (26) indicate the distance (Y) between the supporting surface of the busbar on the template and the centre of the hole to be punched.

- Release the clamping lever (13).
- Adjust the slide (14) to the required size.
- Tighten the clamping lever (13).
- Twist the knurled screws (15) until the required size has been set.

## Inserting the hole template



- Open the RSV - the marking on the knob is in a vertical position.



- For perforating, the indexing bolt (3) must be locked into the V groove. If this is not the case, lift up the indexing bolt, rotate through 90° and lock into the V groove.
- Push the safety device (5) backwards until it locks into position.
- Insert the hole template with groove (X) into the fixing point (F) of the perforating tool.

### **Note:**

*It is important that the hole templates are inserted as shown in the diagram. The clamping lever (13) must be located on the left-hand side (L).*

- Insert the busbar and push against the template stop.
- Hold the safety device (5) steady and push the lever (6) towards the handle (5a). Push back the safety device.

### **Note:**

*Perforating cannot be initiated whilst the safety device is in the locked position.*

- Operate the foot-switch and hold until the perforating process is complete.
- Release the foot-switch.
- Take out the busbar.

## Perforating

See chapter 6 "Perforating"

## 11. Swan-neck bending tools

### Applications

Copper and aluminium busbars can be bent using the swan-neck bending tools. The maximum cross-section is as follows:

**for swan-neck bending tool (small), order no.: 31425**

for aluminium:	120 x 10
for copper:	120 x 6
	80 x 10

**for swan-neck bending tool (large), order no.: 31646**

for aluminium:	120 x 10
for copper:	120 x 10

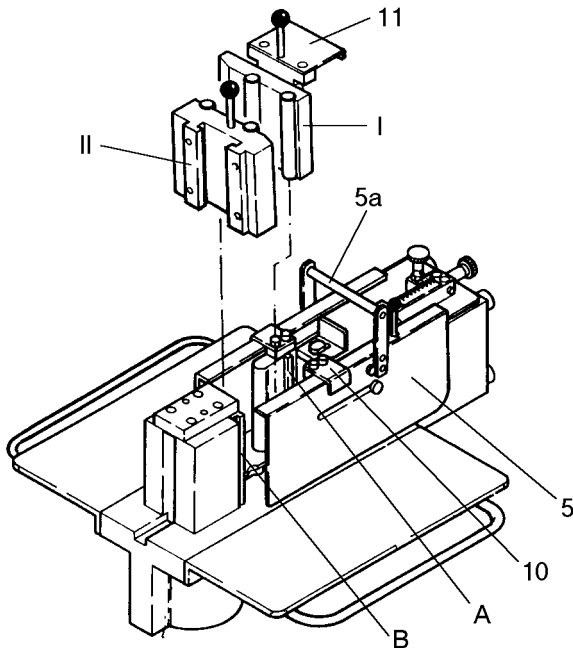
The maximum swan-neck height for the relevant cross-sections can be taken from the table. Smaller swan-neck heights can also be achieved by limiting the stroke accordingly. The stroke settings for:

**swan-neck height = material thickness**

are likewise listed in the table.

The values shown in the table are only intended as guidelines. The precise settings depend on the individual material and must be determined by means of test bends.

### Installing the swan-neck bending tool



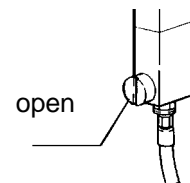
- Insert the swan-neck bending tool part II in the guide (B).
- Insert the swan-neck bending tool part I in the guide (A).

**Note:**

*The guard plate (11) must engage behind the plates (10).*

### Bending

- Open the RSV - the marking on the knob is in a vertical position. The tool returns once the bending operation is complete.
- Push the safety device (5) backwards until it locks into position.
- Insert the busbar.



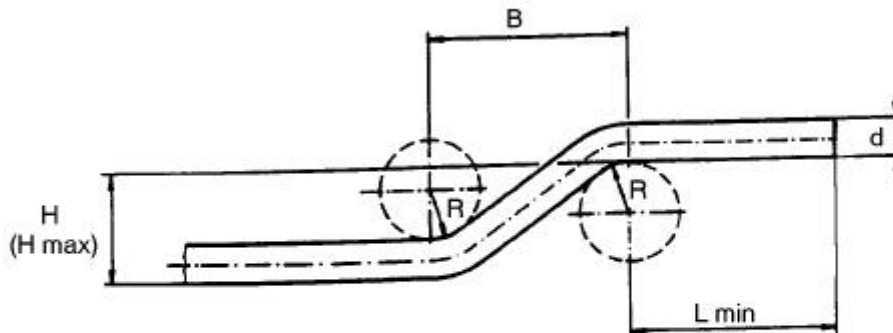
- Establish the shank length.
- Hold the safety device (5) steady and push the lever (6) towards the handle (5a). Push back the safety device.

**Note:**

*Bending cannot be initiated whilst the safety device is in the locked position.*

- If necessary, adjust the stroke using the stroke limiter.
- Press the foot-switch and hold until the hydraulic unit switches itself off.
- Take the busbar out of the tool.

### Tables for swan-neck bending tools



#### Swan-neck bending tool (small), order no.: 31425

Min. length for insertion  $L_{min} = 22 \text{ mm}$

Bending radius  $R = 7.5 \text{ mm}$

Width of swan-neck  $W = 20 \text{ mm}$

Material	Width x thickness	Max. swan-neck height $H_{max}$ (mm)
Aluminium	50 x 4	18
	40 x 8	19
	40 x 10	19.5
	120 x 10	18.5
Copper	40 x 6	18.5
	40 x 8	19
	80 x 8	19
	40 x 10	19.5
	80 x 10	6.5

**Swan-neck bending tool (large), order no.: 31646**

Min. length for insertion L min = 42 mm

Bending radius R = 10 mm

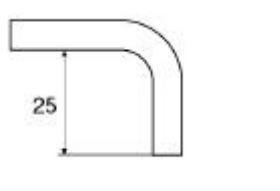
Width of swan-neck W = 40 mm

<b>Material</b>	<b>Width x thickness</b>	<b>Max. swan-neck height Hmax (mm)</b>
Aluminium	50 x 4	22
	40 x 8	25
	80 x 8	25
	120 x 10	28
Copper	40 x 6	23.5
	80 x 6	23.5
	60 x 8	25
	80 x 8	25
	40 x 10	26
	120 x 10	25.5

## 12. Additional bending tool for small lug lengths, order no.: 31636

### Applications

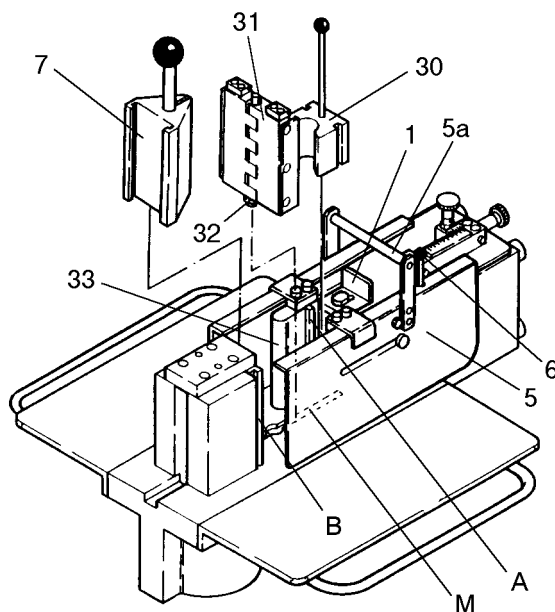
Small lug lengths of up to 25 mm can be bent using the standard bending tool, order no.: 31243, and the additional bending tool, order no.: 31636.



The maximum cross-section is as follows:

for aluminium:	120 x 10
for copper	120 x 6
	80 x 8
	60 x 10

### Installing the additional bending tool



- Push the lock (1) backwards and hold.
- Insert the end stop (30) in the guide (A).
- Release the lock (1) and push forwards if necessary.

**Note:**

*The lock (1) must be in the forward position (starting position); otherwise, the hydraulic unit cannot be switched on.*

- Push the safety device (5) backwards until it locks into position.
- Place the bending hinge (31) in front of the channel iron (33). The guide pin (32) must engage with the guide groove (M) of the table plate.
- Hold the safety device (5) steady and push the lever (6) towards the handle (5a). Push back the safety device.

**Installing the bending tool**

- Insert the bending tool (7) in the guide (B).

**Bending**

See the chapter 7 "Bending"



## 13. Maintenance

**CAUTION:**

BEFORE CONDUCTING ANY MAINTENANCE WORK, DISCONNECT THE HYDRAULIC UNIT OR PULL THE POWER CORD FROM THE HYDRAULIC UNIT!

### SLB120

After each use: Clean guides A and B to remove dirt, swarf etc.  
Clean blade guide M to remove swarf and cutting debris.

Every week: Clean SLB120.

### Perforating tool

After 20 perforations: Grease or oil the upper tool

Before each tool installation: Clean the mounting hole for the lower tool.  
The supporting surface must be free from swarf, dirt etc.

In case of soiling: Clean the supporting surfaces for the hole templates and busbars.

Each week: Clean and oil the perforating tool.

### Lamella cutting set

In case of damage: Change the blade

Service / Repairs

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