Busbars at 120 x 12 mm (160 x 10 mm on request) can easily be bent using a universal working cylinder, and holes of Ø 6.6 up to 21.5 mm including longitudinal holes can be punched through the simple insertion of hole punches.

**Bending busbars**

*Turn switch to “bend”.*

To bend busbars, the bending die is inserted in the hydraulic piston and the electric angle measurer is placed in the round guidance crew on the counter block. The contact cable is connected to the electric motor. The required angle is fixed on the angle scale using an adjusting screw. Since copper springs back, we recommend making a setting 1° - 3° above the required angle depending on the material thickness. You should check the first bending angle. This bending angle can be reproduced as often as required since the bending process is automatically interrupted on achieving the angle by the electrical contact switch.

**Perforating busbars**

*Switch setting to “perforate”.*

The punch with the neoprene scraper and the matching die are placed in the locating hole.

The punch is fixed sideways using a grub screw. Depending on the busbar width and the required hole arrangement, the processing block can be infinitely variably raised or lowered hydraulically using the handwheel. A counter attached to the handwheel shows the height of the hole centre in millimetres.

We recommend centre-punching the busbar and then aligning the punch centring point above the centre punch to guarantee a precise hole location.

The neoprene scraper and a fitted electronic sensor ensure automatic punch retraction.

**Technical data:**

**Bending**

- Bending Cu max: 120 x 12 mm
- Bending up to: more than 90°
- Smallest leg length: 50 mm
- Smallest U-bend: 100 mm
- Smallest Z-bend: 72 mm (depending on material thickness)

The values stated are based on copper rails 120 x 10 mm

**Punching**

- Punching Cu: 6.6 - 21.5 mm
- Also longitudinal hole up to max. L = 21 mm
- Material thickness Cu max: 12 mm
- Material width up to: 110 mm central
- External dimensions L x W x H: 700 x 410 x 410 mm
- Weight: 60 kg

Special version for processing of busbars up to 160 x 10 mm available on request.
**ALFRA BUSBAR, BENDING AND HOLE PUNCHING DEVICE**

**Product No. 03200 SET**
- Freely-programmable digital angle measurer
- Can be used for devices Prod.-No. 03200 and 03980

**Prod.-No.**
- 03200

**Electrical angle measurer R10**
- Prod.-No. 03201

**Bending die R10**
- Prod.-No. 03202

**Length limit stop**
- Prod.-No. 03203

**Bending die with movable jaws (120 x 10 mm Cu)**
- Prod.-No. 03228

**Digital angle measurer**
- Prod.-No. 03229

**Stage bending tool**
- Prod.-No. 03246

with 2 pairs of pressure plates for 5 and 10 mm stages (max. range: 100 x 5 mm / 60 x 10 mm Cu)

---

**Electro-Hydraulic Pump AHP M**

**Technical data:**
- Max. pressure: 700 bar
- Max. flow rate: 1.1 l/min
- Oil type: HLP 32
- Filling volume: 3.2 l
- Working volume: 2.2 l
- Weight: 29 kg
- Operating voltage: 230 V / 50 Hz
- Power: 1.3 kW
- Current consumption: 5.65 A
- Motor speed: 2800 rpm

**Prod.-No.**
- 03855

**Electro-Hydraulic Pump AHP S**

**Technical data:**
- Max. pressure: 700 bar
- Max. flow rate: 0.58 l/min
- Oil type: HLP 32
- Filling volume: 3.2 l
- Working volume: 2.2 l
- Weight: 27 kg
- Voltage / frequency: 230 V / 50 Hz
- Power: 0.75 kW
- Current consumption: 3.26 A
- Motor speed: 2800 rpm

**Prod.-No.**
- 03854

**Electro-Hydraulic Pump AHP S**
- Incl. hand switch

---

**Prod.-No. 03855**
- Optional hand switch for AHP S and AHP M

---

**Prod.-No. 03228**
- Stage bending tool 03246

**Prod.-No. 03854**
- Incl. hand switch
ALFRA BUSBAR BENDING AND HOLE PUNCHING DEVICE

ALFRA busbar set 1:
- Prod.-No. 03911
ALFRA busbar bending and hole punching device with electrical angle measurer R10, bending die R10 and length limit stop
- Prod.-No. 03855
electro-hydraulic pump AHP M

ALFRA busbar set 2:
- Prod.-No. 03921
ALFRA busbar bending and hole punching device with electrical angle measurer R10, bending die R10 and length limit stop
- Prod.-No. 03854
electro-hydraulic pump AHP S

Accessories
Available punches and dies

<table>
<thead>
<tr>
<th>Punch Ø in mm</th>
<th>Metric Screw connection</th>
<th>Material thickness in mm</th>
<th>Max. in mm</th>
<th>Prod.-No.</th>
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Punches and dies for longitudinal holes up to max. L x W = 21 x 18 mm Prod.-No. 03241
**ALFRA Busbar Cutting Device – S 125**

For clean, burr-free cutting of copper busbars 125 x 12 mm.

- Ideal supplementary device for busbar bending and hole punching device.
- Cutting time with electro-hydraulic pump depending on rail width 5 - 15 sec.
- Hold-down device and guidance fixture for central, precise cutting.
- Top cutter replaceable and resharpenable.
- Weight: 16 kg

**ALFRA busbar cutting device – S 125**

Prod.-No. 03250

Replacement top cutter 03251

With use of electro-hydraulic pump AHP M in direct connection with the cutting device, we recommend the use of a footswitch with START – STOP – OFF function.

Footswitch with START – STOP – OFF (direct connection to basic device 03200) 03865

Footswitch with START – STOP – OFF (direct connection to hydraulic pump 03855) 03863

As a drive we recommend electro-hydraulic pump AHP M 03855

**ALFRA – Workshop Trolley**

For the bus bar bending and hole punching device 03200SET and the busbar cutting device 03250

Ideal for transportation - also in vans with standard fittings

Specially-developed workshop trolley for storing both processing devices and saving space. The electro-hydraulic pump can be connected to a fitted 2-way valve in the trolley. The processing devices are connected to each other with hydraulic hoses.

2 support rollers fitted to the side of the table make bending and cutting of long rails easier.

The trolley has an additional drawer with tool compartments for storing all punches and dies. The trolley runs on 4 casters, 2 of which have a locking device.

The fittings include a single and double power socket in addition to a self-rolling 230 V connecting cable at 3 m length.

Table size: 1,050 x 700 mm
Dimensions: L=1150, W=700, H=900 mm
Weight: 100 kg without devices

**Workshop trolley, with 2-way valve, coupling,**

Prod.-No. 03950

**Drawer with tool compartments**

Prod.-No. 03950 illustration shows fitted workshop trolley
for bending busbars at 120 x 12 mm,
- for perforating busbars Ø 6.6 - 21.5 mm,
- for cutting busbars 125 x 12 mm,
- two additional hydraulic outputs
  for various applications

The processing stations for busbar cutting and hole punching and
for cutting are recessed in the table. This enables quick, clean
working.

You can use a hand wheel to infinitely variably raise and lower the
universal working cylinder by hydraulic power according to the hole
pattern to be punched.

The processing devices are connected to a hydraulic central unit fitted
to the inside of the trolley.

A support extension, which can be pulled out of the side, is provided as
a support for longer rails.

Press heads (e.g. press head 10 - 300 mm² Prod.-No. 03360) and hy-
draulic cylinder Prod.-No. 02012 can be connected to 2 hydraulic hoses
fitted to the side for hole-punching.

1 footswitch including connecting cable is included in delivery. Up to 3
additional foot switches can be connected to the various stations.

4 tool drawers with compartments for punches and dies are fitted to the
trolley.

It runs on 4 casters, 2 of which have a locking device.

Technical data:

<table>
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<tr>
<th>Parameter</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Motor voltage</td>
<td>230 V / 50 Hz</td>
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<td>Motor power</td>
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<td>Max. operating pressure</td>
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<td>Flow rate</td>
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<td>Tank volume</td>
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<tr>
<td>Usable oil volume</td>
<td>2.2 l</td>
</tr>
<tr>
<td>Weight approx.</td>
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<tr>
<td>Table size</td>
<td>1,150 x 700 mm</td>
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<tr>
<td>Dimensions L x W x H</td>
<td>1,250 x 760 x 1,210 mm</td>
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Prod.-No. 03980 supplied without additional devices

Required extra accessories

<table>
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<tr>
<th>Component</th>
<th>Prod.-No.</th>
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<tbody>
<tr>
<td>Punches and dies Ø 6.6 - 21.5 mm</td>
<td>03204 - 03214</td>
</tr>
<tr>
<td>Punch: Prod.-No.</td>
<td>03204 - 03214</td>
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<tr>
<td>Die: Prod.-No.</td>
<td>03230 - 03240</td>
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<tr>
<td>Hydraulic press head 10 - 300 mm²</td>
<td>03360</td>
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<tr>
<td>Hydraulic cylinder</td>
<td>02012</td>
</tr>
<tr>
<td>Footswitch with connecting cable, 3-pole</td>
<td>03861</td>
</tr>
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</table>

4 tool draws with compartments for
punches and dies are fitted to the trolley.
We recommend our electro-hydraulic pump AHP S Prod.-No. 03854 as a drive

**Bending busbars up to 120 x 12 mm**

**Perforating busbars Ø 6.6 up to 21.5 mm**

The device consists of a base frame made of torsion-free aluminium profile with a mounting for the base bodies for bending and perforating. A length limit stop makes adjustment of the hole arrangement easier during punching. To make working with longer copper rails easier, the insert frame with support frame can be extended to up to around 700 mm. All limit stops and support frames are quick and easy to fix using clamping levers.

**Technical data:**

**Bending:**
- Bending Cu max: 120 x 12 mm
- Bending up to: more than 90°
- smallest leg length: 50 mm
- smallest U-bend: 100 mm
- smallest Z-bend: 72 mm

The values stated are based on copper rails 120 x 10 mm

**Punching:**
- Punching Cu: Ø 6.6 - 21.5 mm
- also longitudinal hole up to max. L = 21 mm
- Material thickness Cu max: 12 mm
- Material width up to: 110 mm central
- Dimensions L x W x H: 615 x 370 x 315 mm
- Weight: 44 kg

**Accessories**

Available punches and dies

<table>
<thead>
<tr>
<th>Punch Ø in mm</th>
<th>Metric Screw connection</th>
<th>Material thickness in mm</th>
<th>Prod.-No.</th>
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<table>
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<th>Die ØMax. in mm</th>
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Punches and dies for longitudinal holes up to max. L x W = 21 x 18 mm Prod.-No. 03241

**Round punches and dies**

**longitudinal hole punches and dies**
The device consists of a base frame made of special aluminium and a hydraulic cylinder up to 600 bar.

- Using bending dies R=11 mm and R=5 mm and height adjustment, all busbars of up to max. 160 mm width can be bent to various angles.
- The angle measurement is engraved on the top section.
- Changing over to bending and hole-punching is easy and simple.

### Technical data:

**Bending**
- Bending Cu max.: 160 x 12 mm
- Bending angle up to: 92°
- Smallest leg length: 50 mm internal dimension
- Smallest U-bend: 160 mm internal dimension
- Smallest Z-bend: 55 mm (material-dependent) internal dimension

**Punching/perforating**
- Punching Cu max.: Ø 6.6 - 21.5 mm
- Also longitudinal hole up to max. L = 21 mm

**Material thickness Cu max.:**
- 12 mm
- 160 mm central

**Dimensions L x W x H:**
- 390 x 150 x 330 mm

**Weight:**
- 20 kg

### Recommended drive type

- Electro-hydraulic pump AHP S: Prod.-No. 03854
- Air-hydraulic pump LHP 700: Prod.-No. 02140
- Foot pump: Prod.-No. 02121

### Accessories

- Bending punch R=5 mm for busbars 3-8 mm: Prod.-No. 03259

### Available punches and dies

#### Punch Ø

<table>
<thead>
<tr>
<th>Ø in mm</th>
<th>Metric Screw connection</th>
<th>Max. Material thickness in mm</th>
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#### Die Ø Max.

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- Punches and dies for longitudinal holes up to max. L x W = 21 x 18 mm: Prod.-No. 03241
for punching (without insulation) and cutting of flexible supple bars
Thickness up to 10 mm (without insulation)
Width up to 100 mm (without insulation)

Application areas:
- Cutting and perforation of ribbed copper rails
- Cutting thickness: max. 10 mm
- Hole range: Through holes for bolts M6 – M14
- Dimensions L x W x D: 400 x 250 x 150 mm (without limit stop)
- Weight: 32 kg

Basic device
- Used for mounting of: cutting block and perforating tools
- The pressure unit, consisting of hydraulic piston and cylinder including punch mounting in the top section, is permanently integrated in the basic unit.
- The concentric locating hole for the die and cutting block insert are located in the bottom section. In addition, foldable limit stops are fitted to the front and side for hole punching in the device.

ALFRA ribbed busbar processing device
Cutting block

Prod.-No.
03300
03301

Accessories
Punch with neoprene and pressure plates:
Ø 6.0 mm 03304
Ø 9.0 mm 03305
Ø 11.0 mm 03306
Ø 14.0 mm 03307

Die:
Ø 6.0 mm 03309
Ø 9.0 mm 03310
Ø 11.0 mm 03311
Ø 14.0 mm 03312

Other diameters on request.

Prod.-No. 03854

We recommend our electro-hydraulic pump AHP S as a drive Prod.-No. 03854 or our foot pump Prod.-No. 02121.
Specially developed for assembly work. Compact, strong construction. Easily portable - flexible in use.

For punching steel and copper

Application areas: Punching busbars, general punching tasks in steel and bridge construction, scaffolding etc.

**Technical data:**
- Piston stroke: 18 mm
- Punching force: 270 kN
- **Overhang:** 65 mm
- Working pressure max.: 700 bar
- Punching range:
  - Punch Ø 5.5 - 10 mm
  - Punch Ø 10 - 21 mm
  - Material thickness max. 8 mm, (S235)
  - Material thickness max. 10 mm, (S235)
- Weight: 16 kg
- Dimensions: 220 x 110 x 335 mm

**Tools for copper, aluminium and steel**

<table>
<thead>
<tr>
<th>Ø mm</th>
<th>max. material thickness</th>
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<th>Prod.-No. Die</th>
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<td>03277</td>
</tr>
<tr>
<td>11.0</td>
<td>10 mm</td>
<td>03268</td>
<td>03278</td>
</tr>
<tr>
<td>14.0</td>
<td>10 mm</td>
<td>03269</td>
<td>03279</td>
</tr>
<tr>
<td>18.0</td>
<td>10 mm</td>
<td>03270</td>
<td>03280</td>
</tr>
<tr>
<td>21.0</td>
<td>10 mm</td>
<td>03271</td>
<td>03281</td>
</tr>
</tbody>
</table>

other diameters on request where edge holes are possible

We recommend our electro-hydraulic pump as a drive

AHP S Prod.-No. 03854.