

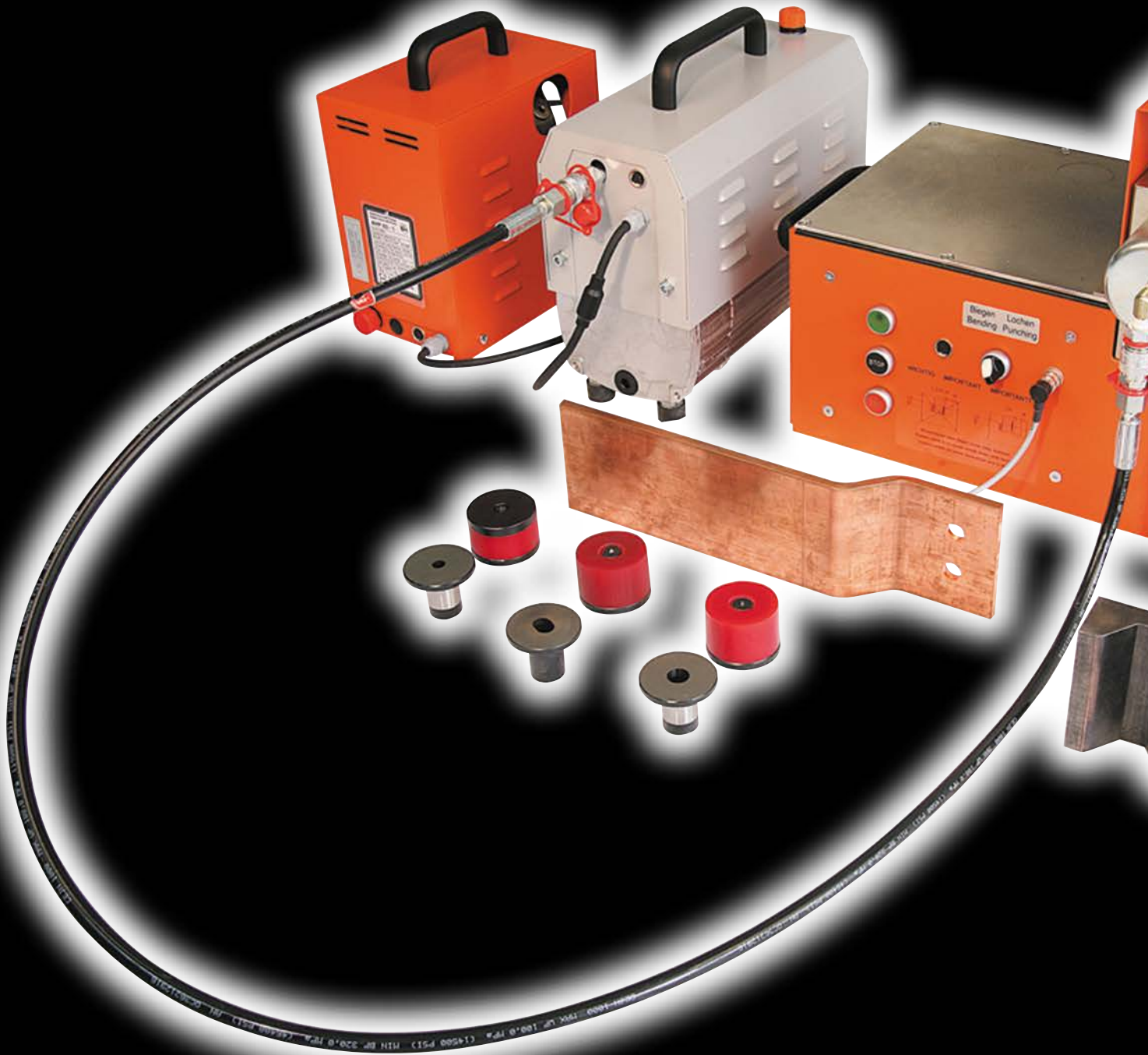


ALFRA BUSBAR

MACHINING

Prod.-No. 03853

Prod.-No. 03852



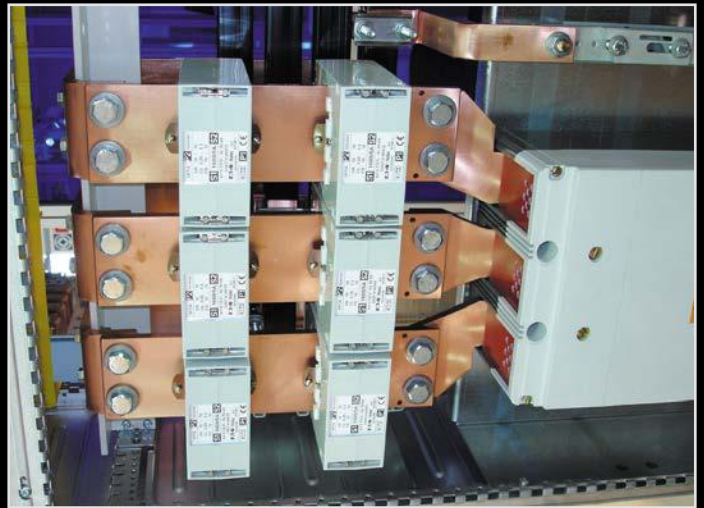
Prod.-No. 03200



Prod.-No. 03202



Prod.-No. 03201





ALFRA BUSBAR BENDING AND PUNCHING MACHINE

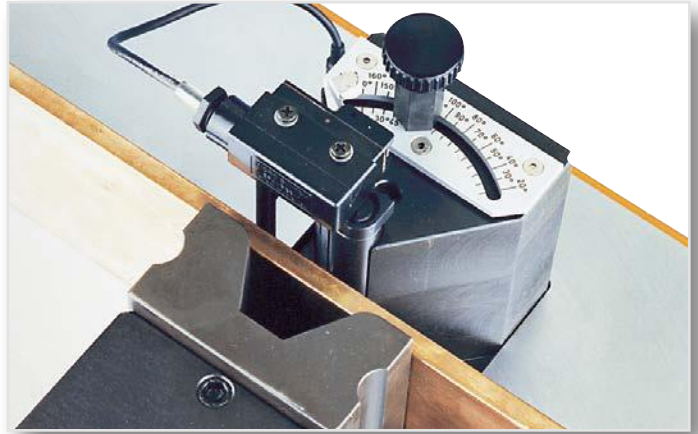
Made in Germany by ALFRA

A universal working cylinder is used to bend busbars 120 x 12 mm (160 x 10 mm on request) easily and punch holes from Ø 6.6 to 21.5 mm or oblong holes by simple insertion of hole punches.

Bending busbars

Switch position to "bending".

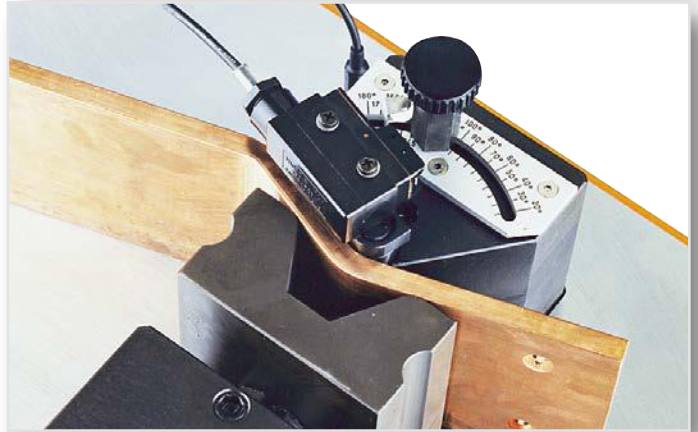
For bending, the bending die is inserted into the hydraulic piston and the electric angle reader is set into the round guide groove of the counter block. The contact cable is connected to the electric motor. The desired angle is fixed on the angle scale using a set screw. Depending on material thickness, we recommend setting the angle 1° - 3° larger than the desired angle, because copper springs back. The first bending angle should be checked. This bending angle can be reproduced as often as required, because the bending process is interrupted by the electric contact switch as soon as the angle has been reached.



Punching busbars

Switch position to "punching".

The punch with neoprene stripper and the corresponding die are inserted in the mounting hole. The punch is fixed at the side using a headless screw. The machining block can be continuously raised or lowered hydraulically using the handwheel in accordance with the busbar width and the required hole layout. A counter fixed on the handwheel indicates the height of the hole centre in mm. We recommend centre-punching the busbar with subsequent alignment of the centring tip of the punch to this point – thus guaranteeing an exact hole pattern.



The neoprene stripper and a built-in electric sensor ensure automatic punch retraction.

Technical data:

Bending

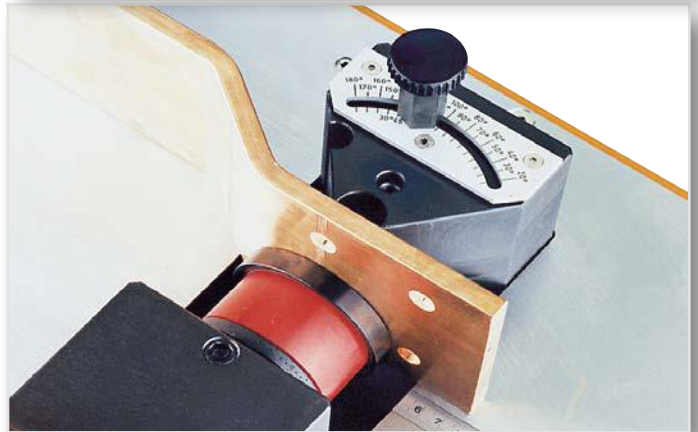
Bending Cu max.	120 x 12 mm
Bending angle up to:	over 90°
Smallest leg length:	50 mm
Smallest U-bending:	100 mm
Smallest Z-bending:	72 mm (depending on material thickness)

The specified values are based on a Cu rail 120 x 10 mm

Punching

Punching Cu:	6.6 - 21.5 mm including oblong holes up to max. L = 21 mm
Material thickness Cu max.:	12 mm
Material width up to:	110 mm centric
Outer dimensions L x W x H:	700 x 410 x 410 mm
Weight:	60 kg

Special version for machining busbars up to 160 x 10 mm available on request.





ALFRA BUSBAR BENDING AND PUNCHING MACHINE



Made in Germany by ALFRA

	Prod.-No.
ALFRA busbar bending and punching machine with electric angle reader R10, bending die R10 and length stop	03200SET
Electric angle reader R10	03201
Bending die R10	03202
Length stop	03203
Bending die with movable jaws (120 x 10 mm Cu)	03228
Digital angle reader	03229
Step-by-step bending tool with 2 pairs of pressure plates for 5 and 10 mm steps (max. range: 100 x 5 mm / 60 x 10 mm Cu)	03246

Electro-hydraulic pump SC-05 III B

Technical data:

Motor voltage:	230 V/50 Hz (110 V/50 Hz or 60 Hz on request)
Motor output:	1.1 kW
Max. operating pressure:	700 bar
Default setting:	620 bar
Pump capacity:	0.9 l/min.
Tank volume:	5.0 l
Weight:	29 kg
Dimensions L x W x H:	500 x 230 x 370 mm

	Prod.-No.
Electro-hydraulic pump SC-05 III B with 2.0 m hydraulic hose + quick coupling	03852
Option:	
Foot switch for start function, 1 pedal	03861
Foot switch for start-stop-off function, 3 pedals	03865

Electro-hydraulic pump AHP 03-1

Technical data:

Motor voltage:	230V/50Hz (110 V/50 or 60 Hz on request)
Motor output:	0.55 kW
Max. operating pressure:	700 bar
Pump capacity:	0.52 l / min. at 50 Hz
Tank volume:	2.5 l
Temperature switch:	80°C +/- 5°
Weight:	17 kg
Dimensions L x W x H:	330 x 180 x 350 mm

	Prod.-No.
Electro-hydraulic pump AHP 03-1 with hand switch and 2.0 m hydraulic hose + quick coupling	03853
Option:	
Foot switch with 2 pedals, start-stop function	03866



Prod.-No. 03200SET



Freely programmable digital angle reader
Can be used with the devices
Prod.-No. 03200 and 03980

Prod.-No. 03229

Prod.-No. 03201



Prod.-No. 03228



Prod.-No. 03202



Prod.-No. 03853



Prod.-No. 03866



ALFRA BUSBAR BENDING AND PUNCHING MACHINE

Made in Germany by ALFRA

ALFRA busbar set 1:

- Prod.-No. 03200SET
ALFRA busbar bending and punching machine with electric angle reader R10, bending die R10 and length stop
- Prod.-No. 03852
Electro-hydraulic pump **SCo5 III B**

Prod.-No.
03910



Prod.-No. 03910

ALFRA busbar set 2:

- Prod.-No. 03200SET
ALFRA busbar bending and punching device with electric angle reader R10, bending die R10 and length stop
- Prod.-No. 03853
Electro-hydraulic pump **AHP 03-1**

Prod.-No.
03920



Prod.-No. 03920

Accessories

Punches and dies available

Punch Ø mm	Metric screw connection	Prod.-No.
6.6	6.0 up to 5 mm material thickness	03204
9.0	8.0 up to 6 mm material thickness	03205
9.5	8.0 up to 6 mm material thickness	03206
11.0	10.0 up to 12 mm material thickness	03207
11.5	10.0 up to 12 mm material thickness	03208
13.5	12.0 up to 12 mm material thickness	03209
14.0	12.0 up to 12 mm material thickness	03210
17.5	16.0 up to 12 mm material thickness	03211
18.0	16.0 up to 12 mm material thickness	03212
21.0	20.0 up to 12 mm material thickness	03213
21.5	20.0 up to 12 mm material thickness	03214

Dies -S-		Prod.-No.	Dies -L-		Prod.-No.
max. mat. thickness			max. mat. thickness		
6.6	5	03215	6.6	5	03230
9.0	5	03216	9.0	6	03231
9.5	5	03217	9.5	6	03232
11.0	5	03218	11.0	12	03233
11.5	5	03219	11.5	12	03234
13.5	5	03220	13.5	12	03235
14.0	5	03221	14.0	12	03236
17.5	5	03222	17.5	12	03237
18.0	5	03223	18.0	12	03238
21.0	5	03224	21.0	12	03239
21.5	5	03225	21.5	12	03240

Punches and dies for oblong holes up to max. L x W = 21 x 18 mm	Prod.-No.
up to 5 mm material thickness	03226
up to 12 mm material thickness	03241



Round punches and dies



ALFRA BUSBAR CUTTING MACHINE – S 125



Made in Germany by ALFRA

**For the clean and burr-free cutting of copper busbars
125 x 12 mm.**

- Ideal supplement to the busbar bending and punching machine.
- Cutting time with electro-hydraulic pump 5 - 15 sec. depending on busbar width.
- Blank holder and support element for centred and accurate cutting.
- Top blade can be exchanged and resharpened.
- Weight: 16 kg

ALFRA busbar cutting machine – S 125	Prod.-No. 03250
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Spare top blade	03251
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When the electro-hydraulic pump SC-05 III B is used in direct connection with the cutting machine, we recommend the use of a foot switch with START – STOP – OFF function.

Foot switch with START – STOP – OFF (connection directly to the basic machine 03200)	03865
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Foot switch with START – STOP – OFF (connection directly to the hydraulic pump 03852)	03863
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As a drive, we recommend Electro-hydraulic pump AHP 03-01	03853
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Prod.-No. 03250

For use with customer's own drive up to 700 bar please specify coupling size when placing an order.

ALFRA – WORKSHOP CART

Made in Germany by ALFRA

For the busbar bending and punching machine 03200SET as well as the busbar cutting machine 03250

Ideal to transport – even in vans with shelving equipment

Specially developed workshop cart in order to accommodate both machines while saving space. Inside the cart, the electro-hydraulic pump can be connected to a built-in 2-way valve. The machines are coupled to one another using hydraulic hoses.

2 support rollers fixed to the side of the table facilitate the bending and cutting of longer busbars.

The cart also has a drawer with tool compartments for holding all the punches and dies. The cart can be moved on 4 casters, 2 of which can be locked in place.

The equipment includes a single and a double socket outlet as well as a self-recoiling 230 V connection cable 3 metres long.

Table size:	1,050 x 700 mm
Dimensions:	L=1,150, B=700, H=900 mm
Weight:	100 kg without machines

Workshop cart, with 2-way valve, coupling, drawer with tool compartments	Prod.-No. 03950
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Prod.-No. 03950 Illustration shows an equipped workshop cart



ALFRA MACHINING CART = 4 STATIONS

Made in Germany by ALFRA

- For**
- bending busbars 120 x 12 mm,
 - punching busbars Ø 6.6 - 21.5 mm,
 - cutting busbars 125 x 12 mm,
 - two additional hydraulic outlets for different applications

- The machining stations busbar bending and punching as well as cutting are sunk in the table. They make fast and clean work possible.
 - The universal working cylinder can be continuously raised or lowered hydraulically using the handwheel in accordance with the hole pattern to be punched.
 - The machines are coupled to a central hydraulic unit located inside the cart.
 - An extractable support extension at the side is provided for long busbars.
 - Pressing heads (e.g. pressing head 10 - 300 mm² Prod.-No. 03360) and the hydraulic cylinder Prod.-No. 02012 for punching holes can be connected to the 2 additional hydraulic hoses at the side.
 - The scope of supply includes 1 foot switch with connection cable. Up to 3 **additional** foot switches can be connected to the different stations.
 - There are 4 tool drawers with compartments for hole punches and dies in the cart.
- It can be moved on 4 casters, 2 of which can be locked in place.**

Technical data:

Motor voltage:	400 V / 50 Hz
Motor output:	1.1 kW
Max. operating pressure:	700 bar
Default setting:	600 bar
Pump capacity:	0.88 l/min.
Tank volume:	17.0 l
Useful oil volume:	13.0 l
Weight approx.	240 kg
Table size:	1,150 x 700 mm
Dimensions L x W x H:	1,250 x 760 x 1,210 mm

Prod.-No.
03980

ALFRA 4-station machining cart

Extra accessories required

Punches and dies Ø 6.6 - 21.5 mm
 Punches: Prod.-No. 03204 - 03214
 Dies: Prod.-No. 03215 - 03240

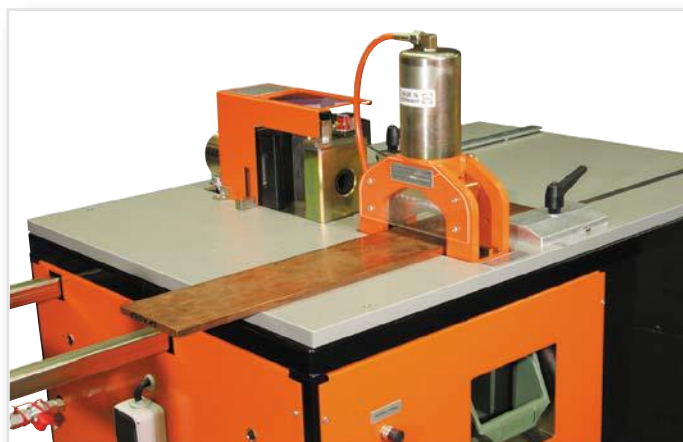
Hydraulic pressing head 10 - 300 mm² 03360

Hydraulic cylinder 02012

Foot switch with connection cable, 3-pole 03861



Prod.-No. 03980 delivered without additional machines



There are 4 tool drawers with compartments for hole punches and dies in the cart.



ALFRA BUSBAR BENDING AND PUNCHING MACHINE – LPV



Made in Germany by ALFRA

Bending busbars up to 120 x 12 mm
Punching busbars Ø 6.6 to 21.5 mm

The machine comprises a main frame made of torsion-free aluminium profile with the mount for the basic bending and punching machine. A length stop makes it easier to set the hole pattern for punching. To make work with longer copper rails easier, the retractable frame with support bracket can be extended to approx. 700 mm. All stops and support brackets are easily and quickly fixed in place by means of clamping levers.

Technical data:

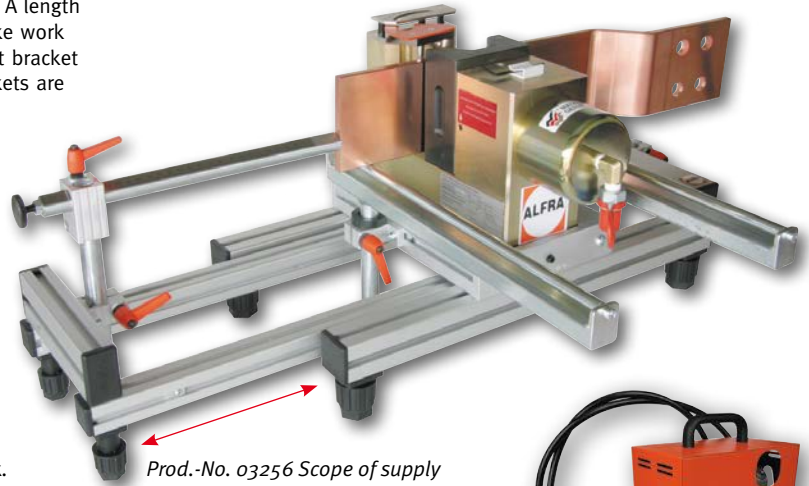
Bending:

Bending Cu max. 120 x 12 mm
 Bending angle up to: over 90°
 Smallest leg length: 50 mm
 Smallest U-bending: 100 mm
 Smallest Z-bending: 72 mm (depending on material thickness)

The specified values are based on Cu rails 120 x 10 mm

Punching:

Punching Cu: Ø 6.6 - 21.5 mm including oblong holes up to max. L = 21 mm
 Material thickness Cu max.: 12 mm
 Material width up to: 110 mm centric
 Dimensions L x W x H: 615 x 370 x 315 mm
 Weight: 44 kg



Prod.-No. 03256 Scope of supply without punches and dies

We recommend our electro-hydraulic pump AHP 03-1 Prod.-No. 03853 as a drive

ALFRA busbar bending and punching machine – LPV	Prod.-No. 03256
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Accessories

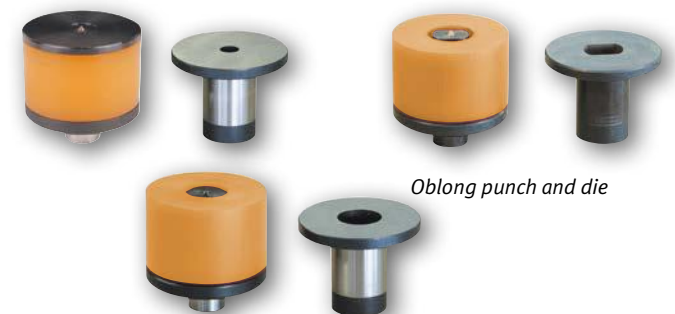
Punches and dies available

Punch Ø mm	Metric screw connection	Prod.-No.
6.6	6.0 up to 5 mm material thickness	03204
9.0	8.0 up to 6 mm material thickness	03205
9.5	8.0 up to 6 mm material thickness	03206
11.0	10.0 up to 12 mm material thickness	03207
11.5	10.0 up to 12 mm material thickness	03208
13.5	12.0 up to 12 mm material thickness	03209
14.0	12.0 up to 12 mm material thickness	03210
17.5	16.0 up to 12 mm material thickness	03211
18.0	16.0 up to 12 mm material thickness	03212
21.0	20.0 up to 12 mm material thickness	03213
21.5	20.0 up to 12 mm material thickness	03214



Dies -S- max. mat. thickness	Prod.-No.	Dies -L- max. mat. thickness	Prod.-No.
6.6 5	03215	6.6 5	03230
9.0 5	03216	9.0 6	03231
9.5 5	03217	9.5 6	03232
11.0 5	03218	11.0 12	03233
11.5 5	03219	11.5 12	03234
13.5 5	03220	13.5 12	03235
14.0 5	03221	14.0 12	03236
17.5 5	03222	17.5 12	03237
18.0 5	03223	18.0 12	03238
21.0 5	03224	21.0 12	03239
21.5 5	03225	21.5 12	03240

Punches and dies for oblong holes up to max. L = 21 mm	Prod.-No.
up to 5 mm material thickness	03226
up to 12 mm material thickness	03241



Oblong punch and die

Round punches and dies



ALFRA BUSBAR BENDING AND PUNCHING MACHINE = BS 160

Made in Germany by ALFRA

- The machine comprises a main frame made of special aluminium and a hydraulic cylinder up to 600 bar.
- By means of the bending bars R=11 mm and R=5 mm and a height adjustment feature, all busbars up to max. 160 mm width can be bent in different angles.
- The angle scale is engraved in the upper section.
- Conversion from bending to punching is simple and easy.

Technical data:

Bending

Bending Cu max.:	160 x 12 mm
Bending angle up to:	92°
Smallest leg length:	50 mm inside dimension
Smallest U-bending:	160 mm inside dimension
Smallest Z-bending:	55 mm (depending on material) inside dimension

Punching

Punching Cu max.:	Ø 6.6 - 21.5 mm including oblong holes up to max. L = 21 mm
Material thickness Cu max.:	12 mm
Material width up to:	160 mm centric
Dimensions L x W x H:	390 x 150 x 330 mm
Weight:	20 kg

Recommended type of drive

Electro-hydraulic pump AHP 03-1	Prod.-No. 03853
Air-hydraulic pump LHP 700	Prod.-No. 02140
Foot pump	Prod.-No. 02121

ALFRA BS 160 with bending die and bending punch R=11 mm for busbar 9-12 mm	Prod.-No. 03258
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Accessories

Bending punch R=5 mm for busbars 3-8 mm	03259
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Punches and dies available

Punch Ø mm	Metric screw connection	Prod.-No.
6.6	6.0 up to 5 mm material thickness	03204
9.0	8.0 up to 6 mm material thickness	03205
9.5	8.0 up to 6 mm material thickness	03206
11.0	10.0 up to 12 mm material thickness	03207
11.5	10.0 up to 12 mm material thickness	03208
13.5	12.0 up to 12 mm material thickness	03209
14.0	12.0 up to 12 mm material thickness	03210
17.5	16.0 up to 12 mm material thickness	03211
18.0	16.0 up to 12 mm material thickness	03212
21.0	20.0 up to 12 mm material thickness	03213
21.5	20.0 up to 12 mm material thickness	03214

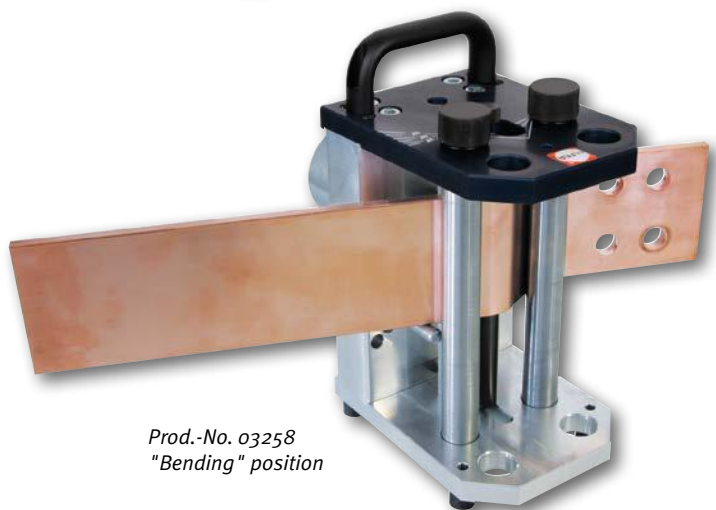
Dies -S-		Prod.-No.	Dies -L-		Prod.-No.
max. mat. thickness			max. mat. thickness		
6.6	5	03215	6.6	5	03230
9.0	5	03216	9.0	6	03231
9.5	5	03217	9.5	6	03232
11.0	5	03218	11.0	12	03233
11.5	5	03219	11.5	12	03234
13.5	5	03220	13.5	12	03235
14.0	5	03221	14.0	12	03236
17.5	5	03222	17.5	12	03237
18.0	5	03223	18.0	12	03238
21.0	5	03224	21.0	12	03239
21.5	5	03225	21.5	12	03240

Punches and dies for oblong holes up to max. L x W = 21 x 18 mm	Prod.-No.
up to 5 mm material thickness	03226
up to 12 mm material thickness	03241

Bending busbars up to 160 x 12 mm Busbar punching Ø 6.6 to 21.5 mm



Prod.-No. 03258
"Punching" position



Prod.-No. 03258
"Bending" position



Prod.-No. 03258
Complete (without punches and dies)



ALFRA – MACHINE FOR PROCESSING LAMINATED BUSBARS



Made in Germany by ALFRA

For punching from M6 – M14 (without insulation) and cutting of bendable laminated busbars

Thickness up to 10 mm (without insulation)

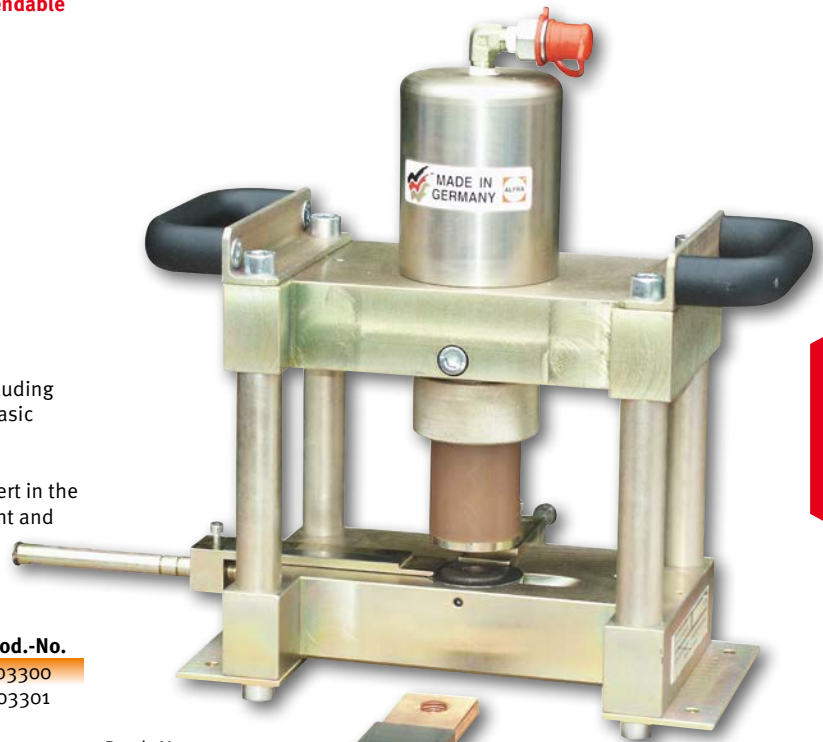
Width up to 100 mm (without insulation)

Area of application:

- Cutting and punching on laminated Cu rails
- Cutting thickness: max. 10 mm
- Hole range: Through holes for M6 – M14 screws
- Dimensions H x W x D: 400 x 250 x 150 mm (without stop)
- Weight: 32 kg

Basic machine

- Serves for holding: Cutting block and hole punching tools
- The pressure unit, made up of hydraulic piston and cylinder including punch holder in the top part, is permanently integrated in the basic unit.
- There is a centric mounting hole for the die and cutter block insert in the bottom part. In addition, there are hinged stops mounted in front and on the sides for punching in the machine.



Prod.-No. 03300

ALFRA machine for processing laminated busbars
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

Dies:

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

Other Ø on request.



Prod.-No. 02121

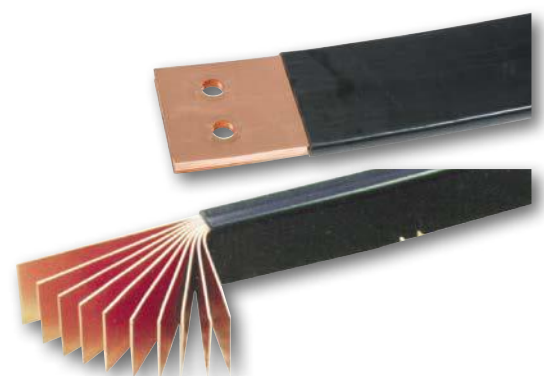


Prod.-No. 03853



Prod.-No. 03301 cutting block with length stop. Is inserted into the basic machine.

We recommend our foot pump Prod.-No. 02121 or our electro-hydraulic pump AHP 03-1 Prod.-No. 03853 as a drive





ALFRA HYDRAULIC PUNCHER = AP-65

- Specially developed for assembly applications. Compact and powerful design. Easily portable – flexible in application.
- For punching steel and copper
- Area of application: For punching busbars, general punching tasks in structural and bridge construction, scaffolding etc.

Technical data:

Piston stroke: 18 mm
Punching force: 270 kN

Outreach:

Working pressure max.: 700 bar
Punching range: **65 mm**
Punch Ø 5.5 - 10 mm, material thickness max. 8 mm, (S235)
Punch Ø 10 - 21 mm, material thickness max. 10 mm, (S235)

Weight: 16 kg
Dimensions: 220 x 110 x 335 mm

Prod.-No.

Hydraulic puncher AP-65

03260

Tools for copper, aluminium and steel

Ø mm	max. material thickness mm	Prod.-No.	Prod.-No.
		Punch	Die
5.5	5	03265	03275
6.6	6	03266	03276
8.0	6	03285	03290
9.0	8	03267	03277
11.0	10	03268	03278
14.0	10	03269	03279
18.0	10	03270	03280
21.0	10	03271	03281

Other Ø on request



Prod.-No. 03853

As a drive, we recommend our electric-hydraulic pump AHP 03-1 Prod.-No. 03853



Prod.-No. 03260



Punches and dies for AP-65