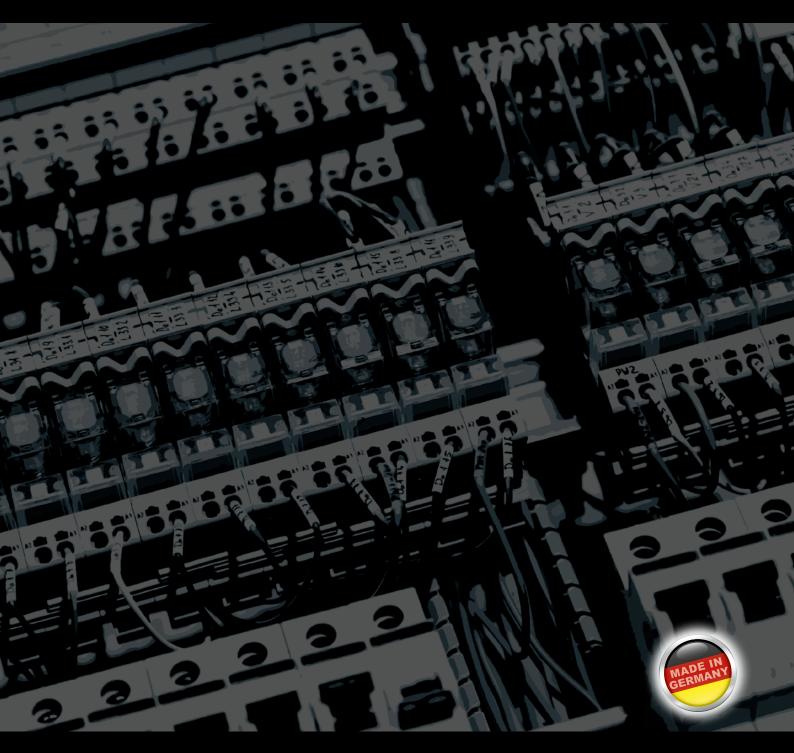


www.alfra.de



QUALITY TOOLS AND MACHINES FOR CONTROL CABINET AND SWITCHGEAR ENGINEERING





WELCOME!

ALFRA

We take pride in our achievement - over 60% in-house manufacturing in four locations in Germany. From our home town in the motorcar race city of Hockenheim, we ship our products on a regular basis to over 120 countries around the world. Our network of agents ensures that practically anybody - really anybody - can use our high-quality products and benefit from their various advantages.

What do we do at ALFRA? - To put it simple: We make holes!

This means, that we manufacture and sell implements, machines and tools for punching and drilling. These are mainly intended for applications in the field of metalworking, with material thickness ranging from 0.8 to more than 100 mm.

On top of that, our product range includes many supplementary items, e.g. in the field of cutting and deburring technology, etc. Come and test us - we look forward to seeing you among our many satisfied customers.

Made in Germany - Made by ALFRA Don't be satisfied with less!

Get our latest news from **www.alfra.de.** Visit our new YouTube channel, **www.youtube.com/alfratools,**

for the latest product and application videos.

Simply scan this QR code with your smartphone or tablet:





JOIN US IN PROMOTING "MADE IN GERMANY", FOR REASONS WHICH ARE TODAY EVEN MORE IMPORTANT AND VALID THAN EVER BEFORE:

- JOB SECURITY
- PROMOTION OF JOB TRAINING
- COMMUNICATION
- QUALITY MANAGEMENT
- ENVIRONMENTAL AWARENESS
- SAFEGUARDING THE FUTURE





IND =X



TOOLS AND MACHINES FOR CONTROL CABINET AND SWITCHGEAR ENGINEERING



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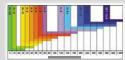








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ALFRA SPUINTER PUNCTING TOOLS - TRISTAR

3-fold splitter punch • Made in Germany by ALFRA

Sheet metal punching system with splitter punch for mild steel (S235). **Operation:** By means of spanner or hydraulic device.

Suitable for sheet thickness (S235):

1.5 mm with screws Ø 6.0 mm2.0 mm with screws Ø 9.5 mm3.0 mm with screws Ø 19.0 mmPre-drilling:screws Ø 6.0 mm: Ø at least 6.2 mmscrews Ø 9.5 mm: Ø at least 9.7 mmscrews Ø 19.0 mm: Ø at least 19.5 mm

- Apply grease to tension screws. Metal lubricating paste protects against wear and seizure > see page 28.
- For hand operation, tension screws with ball bearings (BB) must be used > see below.
- Accessories (tension screws, pre-drills, ...) > see page 27.











Ø in mm	Size metric	Size PG	Size INCI		Size conduit & pipe	ProdNo. (punch and die)	Suitable tension screw with ball bearing Ø x l in mm	ProdNo.	Suitable hydr. screw Ø in mm	ProdNo.
12.5	M 12	-		0.492		01770	6.0 x 40.0	01334	19.0 x 6.0	02022
15.2	-	9		0.598		01771	9.5 X 50.0	01339	19.0 X 9.5	02003
16.2	M 16	-		0.638		01772	9.5 X 50.0	01339	19.0 X 9.5	02003
18.6	-	11		0.732		01773	9.5 X 50.0	01339	19.0 X 9.5	02003
20.4	M 20	13		0.803		01774	9.5 X 50.0	01339	19.0 X 9.5	02003
22.5	-	16	7/8"	0.886	1/2 "	01775	9.5 X 50.0	01339	19.0 X 9.5	02003
25.4	M 25	-	1"	1.000		01776	9.5 X 50.0	01339	19.0 X 9.5	02003
28.3	-	21		1.114	3/4"	01777	9.5 x 50.0	01339	19.0 X 9.5	02003
28.3	-	21		1.114	3/4"	01778	19.0 X 55.0	01340	19	02002
30.5	-	-	1 7/32"	1.201		01779	9.5 x 50.0	01339	19.0 X 9.5	02003
32.5	M 32	-		1.280		01780	19.0 X 55.0	01340	19	02002
34.6	-	-		1.362	1"	01788	19.0 x 55.0	01340	19	02002
37.0	-	29		1.457		01781	19.0 X 55.0	01340	19	02002
40.5	M 40	-		1.594		01782	19.0 x 75.0	01341	19	02002
43.2	-	-	1 11/16"	1.701	1 1/4"	01789	19.0 X 75.0	01341	19	02002
47.0	-	36		1.850		01783	19.0 X 75.0	01341	19	02002
49.6	-	-	1 15/16"	1.953	1 1/2 "	01790	19.0 X 75.0	01341	19	02002
50.5	M 50	-		1.988		01784	19.0 X 75.0	01341	19	02002
54.0	-	42	2 1/8"	2.126		01785	19.0 X 75.0	01341	19	02002
60.0	-	48		2.362		01786	19.0 X 75.0	01341	19	02002
61.5	-	-	2 3/8"	2.421	2"	01791	19.0 X 75.0	01341	19	02002
63.5	M 63	-	2 1/2"	2.500		01787	19.0 X 75.0	01341	19	02002

TIP: Use hydraulic screws made of high-alloy tool steel for heavier duty applications (made from a single piece) – 19.0 x 9.5 mm Prod.-No. 02010



3-fold splitter punch • Made in Germany by ALFRA

All sets are delivered in robust and practical plastic cases.



Prod.-No. 01757

ALFRA



ALERA SPULMER PUNCHING TOOLS TRISTAR PUIS

3-fold splitter punch • Made in Germany by ALFRA

Sheet metal punching system with splitter punch for stainless steel (F = 600 N/mm²) and mild steel (S235). Operation: By means of spanner or hydraulic device. Suitable for sheet metal thickness (stainless steel F = 600 N/mm²): 2.0 mm with screws Ø 11.1 mm 2.5 mm with screws Ø 19.0 mm Pre-drilling: screws Ø 11.1 mm: Ø at least 11.3 mm screws Ø 19.0 mm: Ø at least 19.5 mm Apply grease to tension screws. Metal lubricating paste protects against wear and seizure > see page 28. For hand operation, tension screws with ball bearings (BB) must be used > see below. Accessories (tension screws, pre-drills, ...) > see page 27. Prod.-No. 02007 . Militation is system fit in a state of the Prod.-No. 01342

Prod.-No. 02002

Ø in Size Size Size Prod.-No. Suitable Prod.-No. Suitable Prod.-No. Size mm metric PG INCH conduit & pipe (punch and die) tension screw hydr. screw with ball bearing Ø in mm Øxlinmm 01600 11.1 x 60.0 19.0 X 11.1 0.598 02007 15.2 9 01342 16.2 M 16 0.638 01656 11.1 x 60.0 01342 19.0 X 11.1 02007 02007 18.6 01603 11.1 X 60.0 0.732 19.0 X 11.1 11 01342 M 20 0.803 01606 11.1 x 60.0 19.0 X 11.1 02007 20.4 13 01342 1/2 " 22.5 7/8" 0.886 11.1 x 60.0 19.0 X 11.1 16 01609 01342 02007 M 25 . 1" 1.000 01659 11.1 x 60.0 19.0 X 11.1 02007 25.4 01342 3/4" 01612 19.0 x 55.0 28.3 21 1.114 01340 19 02002 1 7/32" 30.5 1.201 01615 19.0 x 55.0 01340 19 02002 --32.5 M 32 -1.280 01662 19.0 X 55.0 01340 19 02002 1" 01618 34.6 -1.362 19.0 X 55.0 01340 19 02002 . 01621 19.0 x 55.0 02002 37.0 29 1.457 01340 19 M 40 01665 40.5 1.594 19.0 X 75.0 01341 10 02002 -1 11/16" 1.701 1 1/4" 01624 19.0 x 75.0 19 02002 43.2 -01341 -36 01627 19.0 X 75.0 47.0 1.850 01341 19 02002 -1 15/16" 1 1/2" 49.6 1.953 01630 19.0 x 75.0 01341 19 02002 -50.5 M 50 1.988 01668 19.0 X 75.0 01341 19 02002 2 1/8" 2.126 54.0 -42 01633 19.0 x 75.0 01341 19 02002 60.0 . 48 2.362 01636 19.0 X 75.0 01341 19 02002 2 3/8" 2.421 61.5 2" 01640 19.0 X 75.0 01341 19 02002 M 63 2 1/2" 63.5 -2.500 01671 19.0 X 75.0 01341 19 02002

TIP: Use hydraulic screws made of high-alloy tool steel for heavier duty applications (made from a single piece) – 19.0 x 11.1 mm Prod.-No. 02011

01653

Supplementary set

Splitter Punching Tool Set Tristar Plus – Metric Prod.-No. for mild steel (S235) and stainless steel sheets 01652

for mild steel (S235) and stainless steel sheets Contents: 5 Tristar Plus punches and dies M 16 - M 40 Ø 16.2 - 20.4 - 25.4 - 32.5 - 40.5 mm

in a plastic case

Splitter Punching Tool Set Tristar Plus – Metric Prod.-No.

for mild steel (S235) and stainless steel sheets

Contents: 7 Tristar Plus punches and dies M 16 - M 63 Ø 16.2 - 20.4 - 25.4 - 32.5 - 40.5 - 50.5 - 63.5 mm in a plastic case







SAUMER PUNCTING TOOLS TIRGTAR AUS-S



Sheet metal punching system with splitter punch for stainless steel (F = 600 N/mm²) and mild steel (S235). **Operation:** By means of spanner or hydraulic device.

Suitable for sheet metal thickness (stainless steel F = 600 N/mm²):

2.0 mm with screws \emptyset 9.5 mm 2.5 mm with screws Ø 11.1 mm

- 3.0 mm with screws Ø 19.0 mm
- Apply grease to tension screws. Metal lubricating paste protects against
- wear and seizure > see page 28.
- For hand operation, tension screws with ball bearings (BB) must be used > see below.
- Accessories (tension screws, pre-drills, ...) > see page 27.



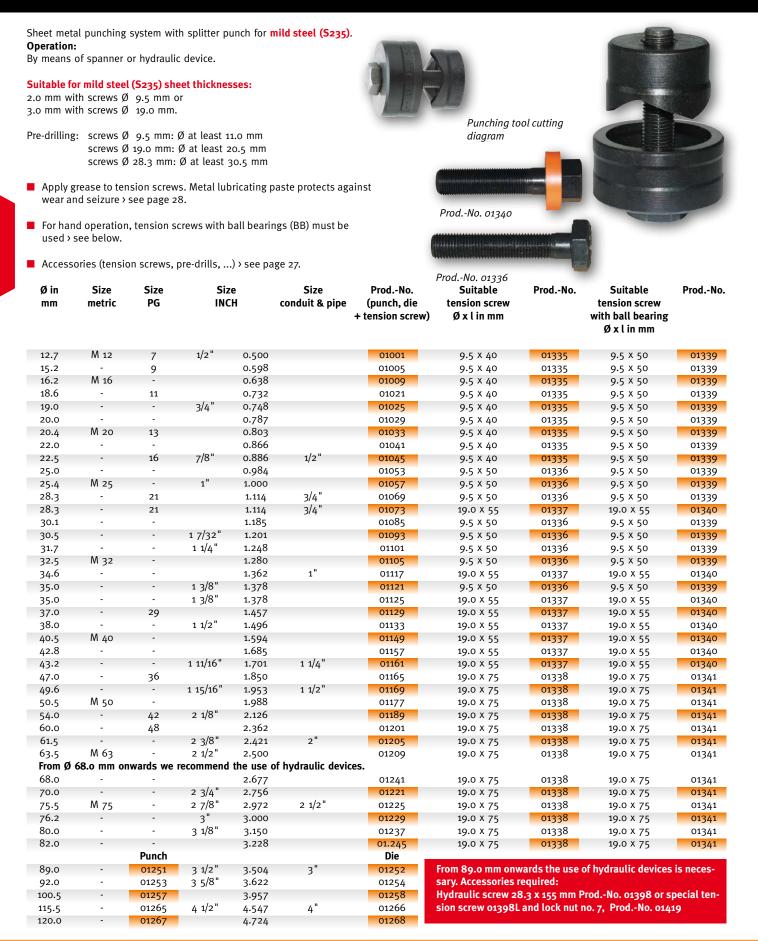
Ø in mm	Size metric	Size PG	Siz INC		Size conduit & pipe	ProdNo. (punch and die)	Suitable tension screw with ball bearing Ø x l in mm	ProdNo.	Suitable hydr. screw Ø in mm	ProdNo.
12.7	M 12	7	1/2 "	0.500		01510	9.5 x 50	01339	19.0 X 9.5	02003
15.2	-	9		0.598		01513	9.5 X 50	01339	19.0 X 9.5	02003
16.2	M 16	-		0.638		01516	9.5 X 50	01339	19.0 X 9.5	02003
18.6	-	11		0.732		01519	9.5 x 50	01339	19.0 X 9.5	02003
20.4	M 20	13		0.803		01522	11.1 X 60	01342	19.0 X 11.1	02007
22.5	-	16	7/8"	0.886	1/2 "	01525	11.1 x 60	01342	19.0 X 11.1	02007
25.4	M 25	-	1"	1.000		01528	11.1 x 60	01342	19.0 X 11.1	02007
28.3	-	21		1.114	3/4"	01531	19.0 X 55	01340	19	02002
30.5	-	-	1 7/32"	1.201		01534	19.0 X 55	01340	19	02002
32.5	M 32	-		1.280		01537	19.0 X 55	01340	19	02002
37.0	-	29		1.457		01540	19.0 X 55	01340	19	02002
40.5	M 40	-		1.594		01543	19.0 X 75	01341	19	02002
47.0	-	36		1.850		01546	19.0 X 75	01341	19	02002
50.5	M 50	-		1.988		01549	19.0 X 75	01341	19	02002
54.0	-	42	2 1/8"	2.126		01552	19.0 X 75	01341	19	02002
60.0	-	48		2.362		01555	19.0 X 75	01341	19	02002
63.5	M 63	-	2 1/2"	2.500		01558	19.0 X 75	01341	19	02002





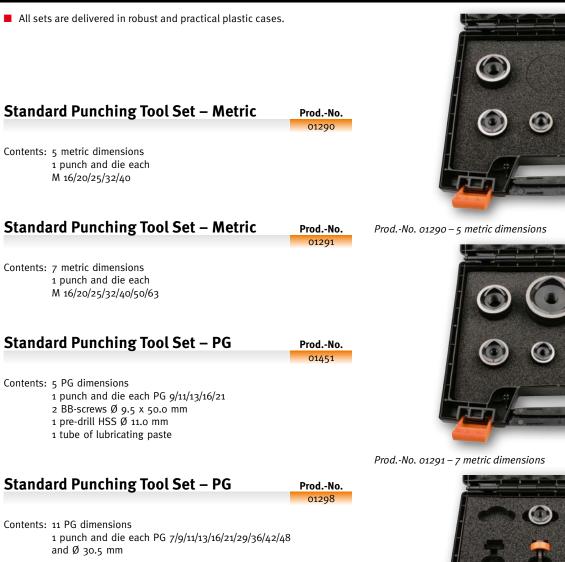


with 3 cutting tips • Made in Germany by ALFRA



STANDARD PUNCHING TOOLS - SIS

with 3 cutting tips • Made in Germany by ALFRA





Prod.-No. 01298 – 11 PG dimensions



ALFRA



0



AUTA PUNGIING TOOLS - SANITARY ALFRA

with 3 cutting tips • Made in Germany by ALFRA

For punching holes in kitchen sinks

Size mm	Designation	Screw size mm	ProdNo.
Ø 28.3	Puncher, compl.	M 10 X 1	01293
Ø 31.7	Puncher, compl.	M 10 X 1	01294
Ø 35.0	Puncher, compl.	M 10 X 1	01295
Ø 37.0	Puncher, compl.	M 10 X 1	01292
	Spare tension screw	M 10 X 1	01299





Punching tool set – sanitary

Prod.-No.

with 3 dimensions in a plastic case

Contents: 3 punching tools 28.3 + 31.7 + 35.0 mm

- 3 tension screws M 10.0 x 1
- 1 HSS-Co pre-drill Ø 11.0 mm
- 1 metal lubricating paste

01450



Prod.-No. 01450

AUTA DOUBLE PUNCHING TOOLS - SANITARY

with 3 cutting tips

- For punching holes in kitchen sinks
- Size 19 spanner operation

Size mm	Designation	Screw size mm	ProdNo.
28 and 32	Puncher, compl.	10 x 55 special	01456
32 and 35	Puncher, compl.	10 x 55 special	01460
	Spare tension screw	10 x 55 special	01457



Reversible die

Prod.-No. 01456 – Double puncher Ø 28/32 mm Prod.-No. 01460 – Double puncher Ø 32/35 mm



PUNCTING TOOLS - SQUARE



- All punchers have a lateral ejection for the waste piece. No jamming inside the die.
- For mild steel (S235).
- The punchers are delivered in robust and practical plastic cases.
- When placing an order for hydraulic operation please specify the hydraulic model.



4 markings for exact positioning in the cross-hairs.

Lateral ejection – utility model no. G9104064.7

ALFRA

Size mm	Max. For material thickness operation by mm / (S235)
12.7 X 12.7	1.75
15.8 x 15.8	1.75
19.0 X 19.0	2.0
22.2 X 22.2	2.0
24.0 X 24.0	2.0
25.4 X 25.4	2.0
45.5 × 45.5	3.0
46.0 x 46.0	3.0
50.8 x 50.8	3.0
68.0 x 68.0	3.0
92.0 x 92.0	3.0
125.0 X 125.0	3.0
138.0 x 138.0	3.0

		Spare	parts		
ProdNo.	ProdNo.	ProdNo.	ProdNo.	ProdNo.	Pre-drilling
Puncher	Tie	Lock	BB forcing	Adapter	ø
	bolt	nut	nut fo	or hydraulics	s mm
01300	01348	01355	01352	01353	10
01301	01348	01355	01352	01353	10
01302	01347	01351	01352	01353	14
01303	01347	01351	01352	01353	14
01331	01347	01351	01352	01353	14
01304	01360	01354	01359	01361	17
01313	01345	01350			20
01305	01345	01350			20
01306	01344	01350			24
01308	01344	01349			24
01309	01343	01349			30
01431	01343	01356			30
01311	01343	01356			30

PUNCHING TOOLS FOR STATUTES STATL-SQUARE

Made in Germany by ALFRA

■ Special version for stainless steel (F = 600 N/mm²) and mild steel (S235).

			Spare parts					
Size mm	Max. material thickness mm / VA	For operation by	ProdNo. Puncher	ProdNo. Tie bolt	ProdNo. Lock nut	Pre-drilling Ø mm		
46.0 x 46.0	2.0		01312	01345	01350	20		
68.0 x 68.0	2.0		01315	01344	01349	24		
92.0 X 92.0	2.0		01316	01343	01349	30		

Other sizes available on request.



ALFRA PUNGHING TOOLS – REGENIGULAR

Made by ALFRA Germany

- All punchers have a lateral ejection for the waste piece. No jamming inside the die.
- Complete for hand and hydraulic operation.
- For mild steel (S235).
- The punchers are delivered in sturdy plastic cases.
- When placing an order for hydraulic operation please specify the hydraulic model.

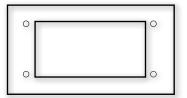


			Spare parts				
Size mm	Max. For material thickness operation by	ProdNo. Puncher	ProdNo. Tie	ProdNo. Lock	ProdNo BB forcing	. ProdNo. Pi g Adapter	re-drilling Ø
	mm / (S235)		bolt	nut or bridge		for hydraulics	mm
17.0 X 19.0	2.0	01317	01347	01351	01352	01353	14
21.8 x 25.8	2.0	01318	01360	01351	01359	01361	17
22.0 X 30.0	2.0	01319	01360	01351	01359	01361	17
22.0 X 42.0	2.0	01320	01360	01351	01359	01361	17
25.0 x 50.0	2.0	01332	01360	01418	01359	01361	17
45.0 x 92.0	2.0	01314	01344	01349			24
46.0 x 92.0	2.0	01329	01344	01349			24
68.0 x 138.0	3.0	01330	01343	01358			30

PUNCHING TOOLS - REGENICULAR FOR HEAVY CONNECTORS

Made in Germany by ALFRA

- Only for hydraulic operation.
- For mild steel (S235).



4 centring mandrels are placed in the correct position in the die. When die and punch are pressed against each other, the drilling position is marked on the metal sheet between them. These 4 marks can then be used as a drilling template. The assembly holes for connectors can then be drilled easily using a twist drill.



					Spare parts				
Size mm	Max. material thickness mm / (S235)	For operation by	Number of pins	ProdNo. Puncher	ProdNo. Tie bolt	ProdNo. Lock nut	Pre-drilling Ø mm		
36.0 x 52.0	2.0		6-pin	01325	01344	01350	24		
36.0 x 65.0	2.0		10-pin	01326	01344	01350	24		
36.0 x 86.0	2.0		16-pin	01327	01344	01350	24		
36.0 x 91.0	2.0			01323	01344	01349	24		
36.0 x 112.0	2.0		24-pin	01328	01344	01357	24		
46.0 x 86.0	2.0			01322	01344	01349	24		
46.0 x 112.0	2.0			01324	01343	01349	30		

Other sizes are available on request.

AUTA PUNCTING TOOLS - SUDAMINAD

Made by ALFRA Germany



- For multiple connector "Sub-Min-D".
- For punching the cut-outs for 9 50-pin connectors. Anti-twist-protected axes are used as tie bolts for punch and die.
- All punchers have a lateral ejection for the waste piece. No jamming inside the die.
- The punchers are delivered in robust and practical plastic cases.









			Spare parts					
Size mm	Max. For material thickness operation by mm/(S235)/VA 😥 🔂	ProdNo. Puncher	ProdNo. Tie bolt	ProdNo. Lock nut	BB forcing	ProdNo. Adapter or hydraulics	ø	
9-pin - 19.8 x 11.3	2.0/1.5	01366	01438	01442	01352	01353	10	
15-pin - 28.2 x 11.3	2.0/1.5	01367	01438	01443	01352	01353	10	
25-pin - 41.9 x 11.3	1.75/1.25	01368	01438	01447	01352	01353	10	
37-pin - 58.4 x 11.3	1.75/1.25	01369	01438	01444	01352	01353	10	
50-pin - 55.7 x 13.9	1.65/1.0	01370	01438	01445	01352	01353	10	



<u>AUTRA – SPECIAL NIBBUING TOOL ASN</u>

Made by ALFRA Germany

Application:

ALFRA

- Pre-punched round holes can be expanded easily and at low cost to make square and rectangular holes.
- Especially recommended for manufacturing rare dimensions, square and rectangular shapes (special shapes), which would otherwise require the expensive production of special tools.

Operation:

Use a puncher and a compact hand punch to pre-punch a pilot hole Ø 21.5 mm or Ø 28.5 mm.

Use a nibbling tool with compact punch to expand a round hole into a square or rectangular hole of any size by multiple punching (nibbling) to the final dimension required.

The final dimension should be marked to avoid skew punches.

Material thickness:

max. 2.0 mm (S235)

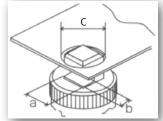
Dimensions:	a	b	c
ASN 15	15.0	6.5	21.5
ASN 20	20.0	9.0	28.5

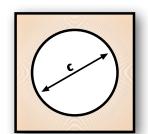
ASN 15	
ASN 20	
Spare punch ASN 15	
Spare punch ASN 20	

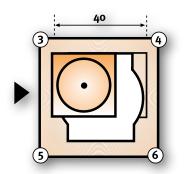


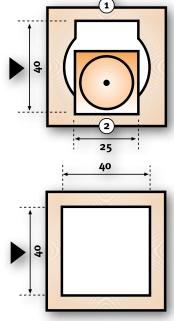
















AUTRA PUNCTING TOOLS - CUSTOMICED



Made by ALFRA Germany

- All punchers have a lateral ejection for the waste piece. No jamming inside the die.
- The punchers are delivered in robust and practical plastic cases.
- When placing an order for hydraulic operation please specify the hydraulic model.



						Spare	parts		
-:3	Size mm Ø	Max. material thickness mm / (S235)	For	ProdNo. operation by	ProdNo. Puncher bolt	ProdNo. Tie nut	Lock	ProdNo. P BB forcing or hydraulics	Adapter
	Ø 22.5 with 3 mm nose	2.0	•••	01420	01333	01351	01352	01353	14
T 22.5 mp@ 1= 18,5 mp =1	Ø 22.5 flattened on 2 sides to 18.5	2.0 mm	• •	01421	01347	01351	01352	01353	14
	Ø 22.5 flattened on 4 sides to 20.1	2.0 mm	• •	01422	01347	01351	01352	01353	14
in the set of a set o	33.3 x 17.0x10.0 for profile cylinders	2.0	• •	01423	01347	01351	01352	01353	14
16.3 2	Ø 16.3 flattened on 4 sides to 14.1	1.75 mm	• •	01427	01348	01355	01352	01353	11

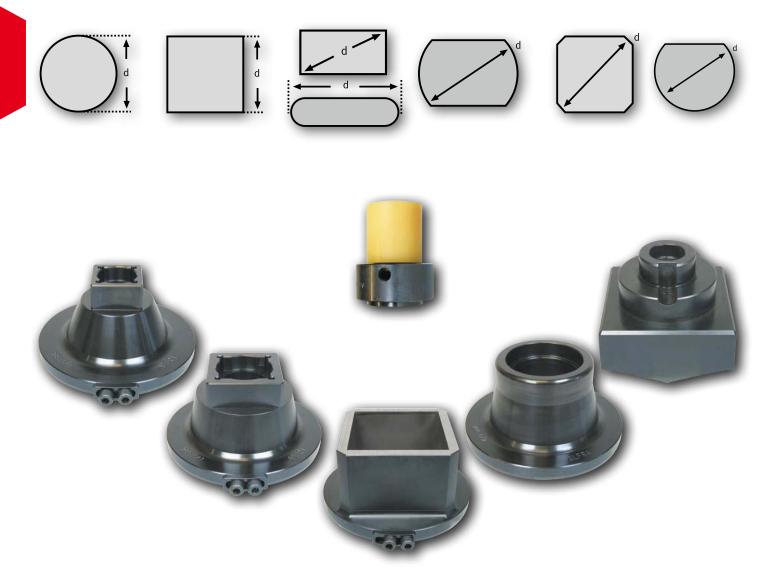


ALFRA

CUSTOMICED PUNCTIMIC TOOLS

Made by ALFRA Germany

- We can manufacture all punching tools in round, square, rectangular shapes according to drawings at short notice.
- Please specify in your inquiry whether you require the tool for hand or hydraulic operation, and state the material thickness and material number.
- Tools punches dies suitable for novopress e.g. HSTL 880/HTL 400 – AVAILABLE from us!!!
- Ask about our technical consultation service.











COMPAGE HAND HADRAULIC PUNCHING STE

Aluminium design – weight only 1.6 kg • Made in Germany by ALFRA



Prod.-No. 01758









Compact hand hydraulic punching set Tristar – Metric Prod.-No.

for mild steel (S235) in a sturdy and practical plastic case

- Contents: 1 aluminium compact hand hydraulic punch
 - 7 Tristar punches and dies M 16 M 63
 - Ø 16.2 20.4 25.4 32.5 40.5 50.5 63.5 mm
 - 1 hydraulic screw Ø 19 mm
 - 1 hydraulic screw Ø 19 x 9.5 mm
 - 1 HSS pre-drill Ø 10 mm
 - 1 set of distance bushes (3 pieces)

Compact hand hydraulic punching set

Tristar Plus – PG

for mild steel (S235) and stainless steel sheets in a sturdy and practical plastic case Contents: 1 aluminium compact hand hydraulic punch 8 Tristar Plus punches and dies

- PG 9 11 13 16 21 29 36 42
 - 1 hydraulic screw Ø 19 mm
 - 1 hydraulic screw Ø 19 x 11.1 mm
 - 1 HSS pre-drill Ø 11.5 mm
 - 1 set of distance bushes (3 pieces)

Compact hand hydraulic punching set Tristar Plus – Metric

for mild steel (S235) and stainless steel sheets in a sturdy and practical plastic case

- Contents: 1 aluminium compact hand hydraulic punch
 - 5 Tristar Plus punches and dies M 16 M 40
 - Ø 16.2 20.4 25.4 32.5 40.5 mm
 - 1 hydraulic screw Ø 19 mm
 - 1 hydraulic screw Ø 19 x 11.1 mm
 - 1 HSS pre-drill Ø 11.5 mm
 - 1 set of distance bushes (3 pieces)

Compact hand hydraulic punching set Tristar Plus – Metric

for mild steel (S235) and stainless steel sheets in a sturdy and practical plastic case Contents: 1 aluminium compact hand hydraulic punch

- 7 Tristar Plus punches and dies M 16 M 63
- Ø 16.2 20.4 25.4 32.5 40.5 50.5 63.5 mm
- 1 hydraulic screw Ø 19 mm
- 1 hydraulic screw Ø 19 x 11.1 mm
- 1 HSS pre-drill Ø 11.5 mm
- 1 set of distance bushes (3 pieces)

Compact hand hydraulic punching set Tristar Plus-S – Metric

for mild steel (S235) and stainless steel sheets in a sturdy and practical plastic case Contents: 1 aluminium compact hand hydraulic punch 5 Tristar Plus -S- punches and dies M 16 - M 40

- Ø 16.2 20.4 25.4 32.5 40.5 mm
- 1 hydraulic screw Ø 19 mm
- 1 hydraulic screw Ø 19 x 9.5 mm
- 1 hydraulic screw Ø 19 x 11.1 mm
- 1 HSS pre-drill Ø 11.5 mm
- 1 set of distance bushes (3 pieces)





01570

Prod.-No. 01570

01758

Prod.-No.

01650

Prod.-No.

016/2

Prod.-No.

01654

Prod.-No. 01650

Prod.-No. 016/2











COMPACT COMBI HAND HYDRAUUC PUNCHING STE

Prod.-No.

01759

Prod.-No. 01759

Aluminium design – weight only 1.9 kg • Made in Germany by ALFRA

ALFRA

Prod.-No. for mild steel (S235) and stainless steel sheets 01651 Contents: 1 aluminium compact combi hand hydraulic punch 8 Tristar Plus punches and dies PG 9 - 11 - 13 - 16 - 21 - 29 - 36 - 42 1 hydraulic screw Ø 19 mm 1 hydraulic screw Ø 19 x 11.1 mm 1 HSS pre-drill Ø 11.5 mm Prod.-No. 01651 1 set of distance bushes (3 pieces) Compact combi hand hydraulic set Tristar Plus – Metric Prod.-No. for mild steel (S235) and stainless steel sheets 016/13 in a sturdy and practical plastic case Contents: 1 aluminium compact combi hand hydraulic punch 5 Tristar Plus punches and dies M 16 - M 40 Ø 16.2 - 20.4 - 25.4 - 32.5 - 40.5 mm 1 hydraulic screw Ø 19 mm 1 hydraulic screw Ø 19 x 11.1 mm 1 HSS pre-drill Ø 11.5 mm 1 set of distance bushes (3 pieces) Prod.-No. 01643 Prod.-No. for mild steel (S235) and stainless steel sheets 01655 in a sturdy and practical plastic case Contents: 1 aluminium compact combi hand hydraulic punch 7 Tristar Plus punches and dies M 16 - M 63 Ø 16.2 - 20.4 - 25.4 - 32.5 - 40.5 - 50.5 - 63.5 mm 1 hydraulic screw Ø 19 mm 1 hydraulic screw Ø 19 x 11.1 mm 1 HSS pre-drill Ø 11.5 mm 1 set of distance bushes (3 pieces) Prod.-No. 01655 Prod.-No. for mild steel (S235) and stainless steel sheets 01575 Contents: 1 aluminium compact combi hand hydraulic punch 5 Tristar Plus -S- punches and dies M 16 - M 40 Ø 16.2 - 20.4 - 25.4 - 32.5 - 40.5 mm 1 hydraulic screw Ø 19 mm 1 hydraulic screw Ø 19 x 9.5 mm 1 hydraulic screw Ø 19 x 11.1 mm 1 HSS pre-drill Ø 11.5 mm 1 set of distance bushes (3 pieces) Prod.-No. 01575

Compact combi hand hydraulic set **Tristar Plus – Metric**

Compact combi hand hydraulic punching set Tristar Plus-S – Metric

in a sturdy and practical plastic case









7 Tristar punches and dies M 16 - M 63 Ø 16.2 - 20.4 - 25.4 - 32.5 - 40.5 - 50.5 - 63.5 mm

1 hydraulic screw Ø 19 mm 1 hydraulic screw Ø 19 x 9.5 mm 1 HSS pre-drill Ø 10 mm 1 set of distance bushes (3 pieces)

Contents: 1 aluminium compact combi hand hydraulic punch

Compact combi hand hydraulic set Tristar Plus – PG

Compact combi hand hydraulic set

Tristar – Metric

for mild steel (S235)

in a sturdy and practical plastic case

in a sturdy and practical plastic case





ALFRA

AUTRA BAMERY-OPERATED COMPACT IMDRAUUC PUNCHER

Made in Germany by ALFRA

Practical hand hydraulic tool with high-performance rechargeable 18 V battery for punching round, square and rectangular cut-outs for control cabinet and switchgear engineering. Extremely manageable and light thanks to the aluminium head which guarantees high tensile strength.

- Light and handy, only 3.7 kg with the rechargeable battery package.
- With pressure control valve.
- High-performance drive motor with ergonomic "soft touch" grip design.
- The rechargeable batteries can be inserted from two sides so you can balance the weight.

Technical data:

to 82 mm Ø mm mild steel (S235),
mm stainless steel (F = 600 N/mm^2)
- 120 mm Ø only with special tension
mm mild steel (S235),
mm stainless steel (F = 600 N/mm^2)
x 68 mm
mm mild steel (S235),
mm stainless steel (F = 600 N/mm²)
x 92 mm only with special tension
ew* and distance bush*
mm mild steel (S235),
mm stainless steel (F = 600 N/mm ²)
kN with pressure control valve
V, 3.0 Ah NiMH
min. after complete discharge
oo under normal conditions
to + 40° C, loss of capacity below o° C

Battery charger

Charges all rechargeable batteries from 18 to 28 V, compatible for NiCD, NiMH and Li-ion batteries. Automatic temperature monitoring. The change from quick-charge to maintenance charge prevents the battery cells being overcharged.

The state of charge is indicated by the LED display. The PCB is completed encapsulated.

Punching time/punching capacity

Ø 22.5 mm 2 mm mild steel (S235) Ø 63.5 mm 2 mm mild steel (S235) 68 x 68 mm 2 mm mild steel (S235) Weight 3.7 kg with rechargeable battery

2.7 kg without rechargeable battery

Pre-drill 11 mm \emptyset – Prod.-No.: 08023 in a sturdy and practical plastic case

Scope of supply:

Complete weight 7.8 kg without punching tools

ALFRA battery-operated compact hand hydraulic punch

with 2 rechargeable batteries 18 V, battery charger 18 - 28 V Hydraulic screw – 9.5 x 19 mm – Prod.-No.: 02003 Hydraulic screw – 19 x 120 mm – Prod.-No.: 02002 Set of distance bushes, 3 pieces – Prod.-No.: 02004

5 sec. 190 holes/battery charge 7 sec. 100 holes/battery charge 7 sec. 70 hoes/battery charge

Prod.-No.

02070







Prod.-No. 02072

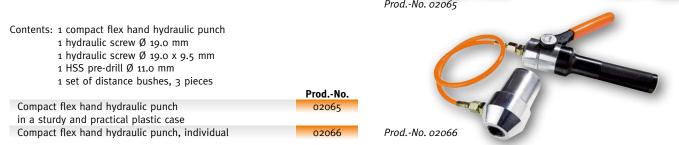
PUMP OVERVIEW



	_		_		_	-	
Recommended combination				~			
			1		J.		
Possible			1				
combination	FOOT PUMP	AHP 03-01	SC-05 III B	DSP-120	LHP 700	ALH 600	
ProdNo.	02121	03853	03852	02027	02140	03190	
			*	-	-	-	
ProdNo. 02012 / 02013							
		-					
ProdNo. 03200SET							
199 Cas							
- -	•		— *		-	•	
ProdNo. 03250							
	_			_	_		
A CONTRACTOR			*	-			
ProdNo. 03256							
			*	_			
ProdNo. 03258	-		_ "	-	-	-	
			*				
ProdNo. 03260	_				_		
ំ							
			*				
ProdNo. 03300							
ProdNo. 03360/03380							
AP 250							
AP 250							
AP 250							
F							
AP 400							
		* in combinat	ion with optional foot switcl	h			







Prod.-No.

02120

AUTRA FOOT PUMP

Made by ALFRA Germany

- Max. operating pressure 700 bar.
- Built-in pressure control valve.
- For all round, square, rectangular and special shape punchers.
- The foot pump leaves both hands free for exact positioning and punching on the control cabinet. The foot pump carrier frame is splayed, guaranteeing safe work without tilting.

Tank volume	270 cm ³
Useful oil volume	210 CM ³
Pumping capacity	1.7 cm ³ per piston stroke

Contents: 1 hydraulic cylinder with quick coupling

- 1 hydraulic hose 2.8 m
 - 1 hydraulic screw Ø 19.0 and 19.0 x 9.5 mm
 - 1 set of distance bushes, 5 pieces
 - 1 pre-drill Ø 11.0 mm
 - without punches and dies

Foot pump set with hydraulic cylinder and accessories

Individual foot pump, with 2.8 m hydraulic hose 02121







ALFRA

AUTA Ingro-IMPAUP AUP OF

Made in Germany by ALFRA

Technical data: Motor voltage:

Motor output:

Pump capacity:

Tank volume:

Weight:

Temperature switch:

Dimensions L x W x H:

Max. operating pressure:

230 V / 50 Hz (110 V / 50 + 60 Hz on request)

0.55 kW, 2,720 rpm 700 bar

> 0.62 l / min. at 60 Hz 0.52 l / min. at 50 Hz 2.5 l / useful volume 1.5 l

80°C +/- 5° 17 kg 330 x 180 x 350 mm

> Prod.-No. 03853

Electro-hydraulic pump AHP 03-1 with hand switch, 2.0 m hydraulic hose with quick coupling

Option:

Foot switch with 2 pedals, start-stop function



AUTRA EUTGIRO-IMDRAUUIC PUMP SCE-05 III B

Made in Germany by ALFRA

Technical data:

- Motor voltage:
- Motor output: Max. operating pressure: Default setting: Pump capacity: Tank volume: Weight: Dimensions L x W x H:

230 V/50 Hz (110 V/50 Hz or 60 Hz on request) 1.1 kW 700 bar 620 bar 0.9 l/min. 5.0 l 29 kg 500 x 230 x 370 mm

- Electro-hydraulic pump SC-05 III B with 2.0 m hydraulic hose + quick coupling Option:
- Foot switch for start function, 1 pedal Foot switch for start-stop-off function, 3 pedals



03861 03865





AUTRA EUTEGTRO-IMDRAUUIC PUMP DSP-120 ALFRA

Compact electro-hydraulic pump, two-stage operation with holding function for single-acting hydraulic cylinder.

Technical data rating v

recinical uat	a		
Operating vol	tage:	230 V/50 Hz	
Motor output:		o.4 kW	
Max. operating pressure:		700 bar	
Pump capacity	y at o - 20 bar:	2.0 l/min	
Pump capacity	, y at 20 - 700 ba	r: 0.2 l/min	
Tank volume:		1.2 l	
Useful oil volu	ume:	0.8 l	
Weight approx	κ.	7.5 kg	
0 11		, , , ,	ProdNo.
Electro-hydra	aulic pump with	accessories	02025
Contents: 0	1x hydraulio	cylinder SKP-1	
0	1x hydraulio	hose 1.8 m	
6	1x hydraulio	screw Ø 19.0 and 19.0 x 9.5 mm	1
4	1x set of di	stance bushes, several pieces	
6	1x pre-drill	Ø 11.0 mm	
6	1x hand sw	itch	
wit	hout punches a	nd dies	
Electro-hydra	aulic pump, indi	vidual, 220 V, with 1.8 m	02027
hydraulic ho	se, quick coupli	ng and hand switch	
Foot switch	with 2 pedals		02029
Hand switch			02030



Prod.-No. 02025

AUTAAR IMPROVICE PUMP - UIP 700

Air hydraulic pump for operating single-acting hydraulic cylinders for punching tools, cable shears, pressing devices or similar applications.

- Robust tank
- Tank ventilation filter
- Reduced noise level
- Oil level indicator on the tank
- Precise starting under load is possible
- Exact control the relief valve operated via the foot pedal permits the load to be reduced exactly
- Hydraulic hose 2.0 m with quick coupling

Technical data

Max. operating pressure:	700 bar
(for a feed pressure of 7 bar)	
Feed line pressure/working rang	e: 2.8 - 10 l
Air connection:	1/4" thre
Pump capacity, pressureless:	1.0 l/min
Pump capacity p max.	
(with 7 bar air):	0.1 l/min
Tank volume:	2.4 l
Useful oil volume:	2.1 l
Weight:	6.3 kg

bar ead

Air hydraulic pump



Prod.-No. 02140

Accessones - The BOLES FOR IMPRAULIC OPERATION

Made in Germany by ALFRA



ACCESSORIES - FOR IMPRAULIC PUMPS

		Prod.
Hydraulic hose for foot pump	2.80 m	0212
Hydraulic hose for LHP 700	2.00 m	021
Hydraulic hose for DSP 120	2.50 m	020
Hydraulic hose for AHP 03-1	2.00 m	021

	ProdNo.
80 m	02122
oo m	02112
50 m	02026
oo m	02116





IMPRAUUC GAUNDERS AND ACCESSORIES

	ProdNo.		
Hydraulic cylinder SKP-1 with quick coupling (up to 11 t) Weight 2.5 kg	02012		
Hydraulic cylinder SKP-1 Mini with quick coupling (up to 7 t) Weight 0.86 kg	02013		
Set of distance bushes, 5 pieces	02014		
Pre-drill Ø 10.0 mm	08036	ProdNo. 02013	
Pre-drill Ø 11.0 mm	08023		
Pre-drill Ø 11.5 mm	08035		
Pre-drill SVB with 5 drilling-Ø 8.5/11.5/12.5/16.5/21.0 mm	08016		ProdNo. 02014
			23 23 23 24
		ProdNo. 02012	ProdNo. 08016



ALFRA





Drip-free coupling and decoupling

Handy to use

- Dust protection cap
- Operating pressure up to 1,000 bar

Locking coupling with internal thread R 1/4"
(for fitting to the hose end)
Locking coupling with internal thread R 3/8"
(for fitting to the hose end)
Lock nipple with internal thread R 1/4"
(for fitting to the cylinder)
Adapter R 1/4" external thread









Prod.-No. 01452

RAULICEUMPS MARANTACOL = FOR/NUR HYD

For refilling hydraulic pumps

1 litre hydraulic oil HLP 46

Prod.-No. 01455

Prod.-No.

33005

Caution: Observe extreme cleanliness when refilling hydraulic devices.



Prod.-No. 01455

AUTRA-SPECIAL METAL AUBRICATING PASTE

To prevent seizure and wear

Areas of application:

- Prevents seizure, wear, cold-welding, fusing and fretting corrosion of the threads of screws, nuts, bolts, pipe threads and fittings.
- ALFRA special metal lubricating paste is excellently suitable for lubricating the cutting tips of punching tools as well as heavy-duty bearings and sliding surfaces.
- Active separation and silicone-free.
- Contents: 120 g

ALFRA special metal lubricating paste

Absolutely recommended when punchers are used with spanners.



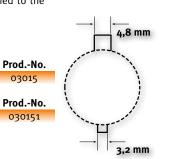
AUTA-Notal Puters

- Easily and quickly punches notches in sheet metal up to 2.0 mm thick.
- Saves the time-consuming filing of grooves for the anti-twist-protection of pushbuttons, switches and instruments.
- Notch sizes 3.2 mm and 4.8 mm possible.
- Max. material thickness 2.0 mm mild steel (S235).
- Notch punch can be exchanged.
- Long tool life because punch and die are made of hardened tool steel.
- Easy punching thanks to large leverage.
- Plastic-coated handles.
- Weight 1.3 kg

The notch punch is inserted into the pre-punched opening, aligned to the cross-hairs marking and then the pliers are actuated. A clean notch is the result!

ALFRA notch pliers

Spare parts Notch punch with rivet pin



03015

Prod.-No. 03015



ALFRA









ALFRA

AUTRA - UNIVERSAL CUMING AND PUNCHING DEVICE

Made by ALFRA Germany

For DIN carrier rails, for hand lever operation for cutting pieces to length and punching holes lengthways and crossways in the carrier rails depicted.

- With a reinforced eccentric located directly above the shearing blade
- Little force required due to better force transfer
- Burr-free cutting without waste
- Maintenance-free
- Anodised, laser-engraved length stop 1,000 mm long with rail-support element for accurate angled cutting, with millimetre and inch scales
- Shearing blade can be resharpened, punch can be exchanged
- Customised versions can also be made (please send in a sample rail approx. 1,000 mm in length)

Scope of supply standard		ProdNo.
with punch for cross and 1,000 mm length stop an incl. C-profile 3415	oblong holes 12 x 6.4 mm d rail-support element	03001
with punch for cross and	oblong holes 12 x 6.4 mm	03001G
1000 mm length stop and incl. G-profile according t		
· _	hole punches 5.5 or 6.0 mm	Ø 03002
as 03001, but with hydra	ulic cylinder	03003
Standard version		\sim
Carrier rail 35 mm/7.5	7.	0
according to EN 60 715	······································	
	- 27	
Carrier rail 35 mm/15	15	
according to EN 60 715	 ``	
	20	
	16.	
-profile 3415		
included in ProdNo. 0300		
	- 34	
		\sim
6-profile		0
according to EN 60 715		60/
included in ProdNo. 0300	116) 110.5	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
, ,	10.5	
Carrier rail 15 mm/5.5 according to EN 60 715		6
0 , , ,		No 1
	10	
Copper earthing rail 10 mm x 3 mm	3 = ===	
	niveral sufficiency day	
Spare parts for the u	niversal cutting and pu	ProdNo.
Spare punch + die 12 x 6	.4 mm for oblong hole	03005
Spare punch + die 12×6		03006
Spare punch + die 5.5 mr		03007

Prod.-No. 03001



Tool for mounting holes (lengthways and crossways) integrated. Rail-support element for accurate 90° cuts





Prod.-No. 03003 We recommend our pump type AHP 03-1 as a drive (Prod.-No. 03853)

also made of stainless steel or aluminium as well as plastic, on request

03008

03012

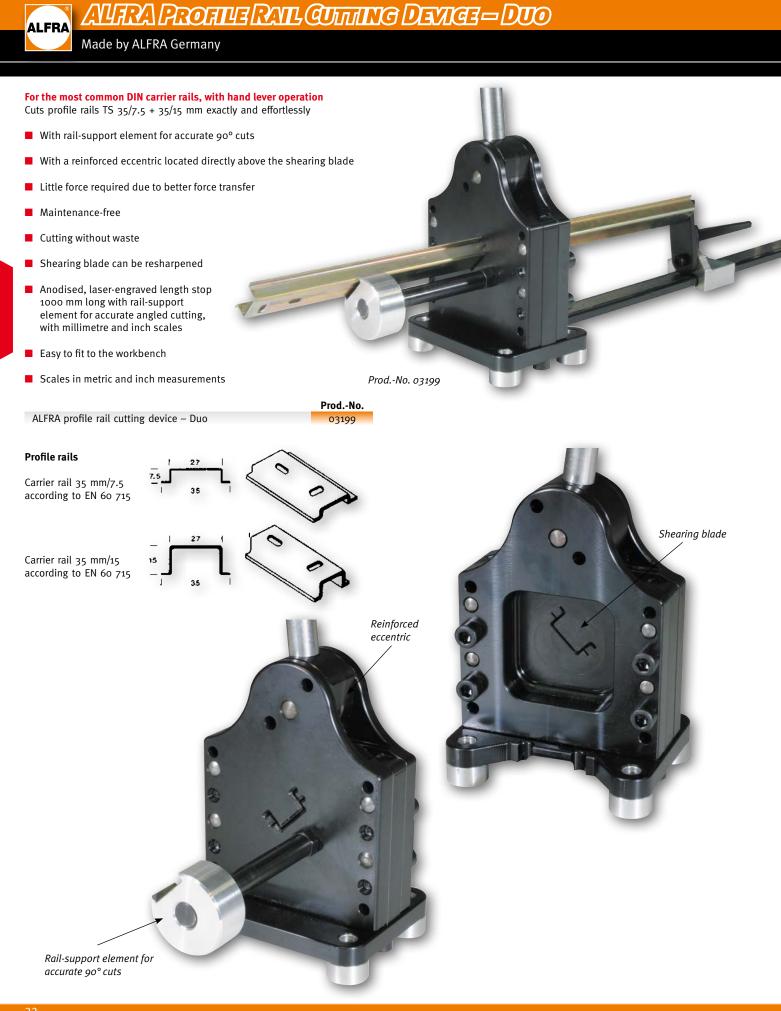
03011

Spare punch + die 6.0 mm for round hole

Special versions for carrier rails or flat rails,

Rail-support element, separate



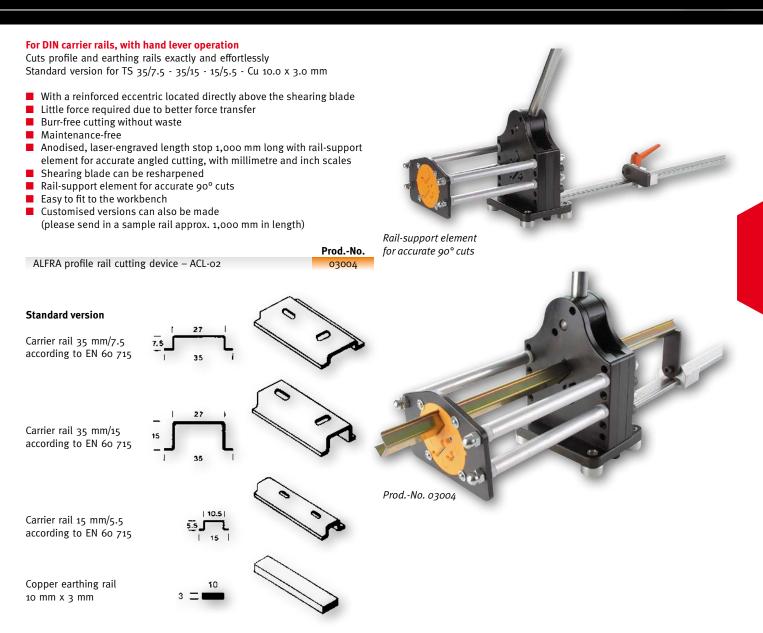




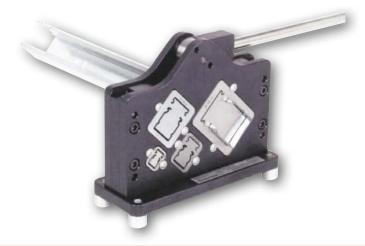
ALFRA

AUTA PROTUS RAL CUMING DEXICE - ALG-02

Made by ALFRA Germany



Customised versions for special profiles such as cable ducts available on request!





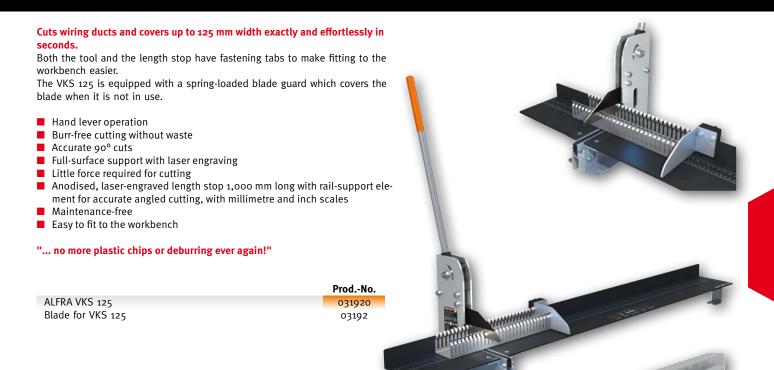




ALFRA

AUTA WIRING DUGT CUMING DEVICE - VIS 123

Made in Germany by ALFRA



Prod.-No. 031920

Amortisation calculation

Assumption:

At least 10 cuts of profile rails or wiring ducts per day

1. Conventional method:

1. COUVE	intionat method.				
a1)	Number of cuts per day	=	10		
b1)	Working time per cut	=	2.00 min		
	(includes providing the auxiliary tools,				
	measuring up, marking, cutting to length,				
	deburring etc.)				
C1)	Labour costs per minute	=	€ 0.70		
Result:					
The cost	The cost incurred daily is \notin 14.00 (10 x 2.00 x 0.70)				
2. Meth	od using DIN rails cutting device or wiring duct				
cuttin	g device				
a2)	Number of cuts per day	=	10		
b2)	Working time per cut	=	o.3 min		
c2)	Labour costs per minute	=	€ 0.70		
Result:					
The cost	(10 X	0.3 X 0.70)			

Difference between 1 and 2 = € 11.90 per working day

Cutting device ProdNo. 03001	VK = € 1,430.00 : 11.90 = 120 days
Cutting device ProdNo. 03004	VK = € 1,070.00 : 11.90 = 90 days
Cutting device ProdNo. 03199	VK = € 662.00 : 11.90 = <mark>56 days</mark>
Cutting device ProdNo. 031920	VK = € 849.00 : 11.90 = 71 days





ALFRA MOUNTING TABUE AMITEGO

Made in Germany by ALFRA





AUTRA EUTERTRICAL MOUNTING TABUE AMITE 200 // AMITE 250

Made in Germany by ALFRA





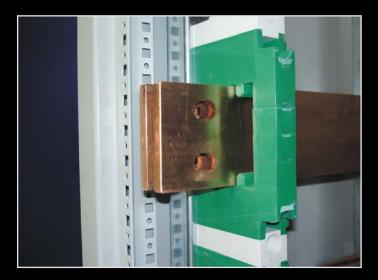














ALFRA BUSBAR BENDING AND PUNGHING MAGHINE

Made in Germany by ALFRA

A universal working cylinder is used to bend busbars $120 \times 12 \text{ mm}$ (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 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:

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

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











AUGRA BUSBAR BENDING AND PUNGHING MAGHINE

Made in Germany by ALFRA



Prod.-No.

03852

03861

03865

Prod.-No.

03853

03866

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

Electro-hydraulic pump SC-05 III B
with 2.0 m hydraulic hose + quick coupling
Option:
Foot switch for start function, 1 pedal

Foot switch for start-stop-off function, 3 pedals

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

Electro-hydraulic pump AHP 03-1 with hand switch and 2.0 m hydraulic hose + quick coupling Option:

Foot switch with 2 pedals, start-stop function



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

- R10



Prod.-No. 03201





Prod.-No. 03228





AUTRA BUSBAR BENDING AND PUNGHING MAGHINE ALFRA

Prod.-No.

03910

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. 03920

Prod.-No.

03214

- 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

20.0



03920

ر		
6	ProdNo.	(

•				
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

up to 12 mm material thickness

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

Accessories Punches and dies available

21.5

Punch Ø mm Metric screw connection

AUTRA BUSBAR GUTTING MAGHINE – S 123

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

Prod.-No. ALFRA busbar cutting machine - S 125 03250 Spare top blade 03251 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 03865 (connection directly to the basic machine 03200) Foot switch with START - STOP - OFF 03863 (connection directly to the hydraulic pump 03852) As a drive, we recommend Electro-hydraulic pump AHP 03-01 03853



ALFRA

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

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

Prod.-No.

03950

Workshop cart, with 2-way valve, coupling, drawer with tool compartments



Prod.-No. 03950 Illustration shows an equipped workshop cart



For

AUTRA MACHINING CART-4 STATIONS

Made in Germany by ALFRA

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

	ProdNo.
ALFRA 4-station machining cart	03980
Extra accessories required Punches and dies Ø 6.6 - 21.5 mm Punches: ProdNo. 03204 - 03214 Dies: ProdNo. 03215 - 03240	
Hydraulic pressing head 10 - 300 mm ²	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.



AUTRA BUSBAR BENDING AND PUNGHING MAGHINE - UPV

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. Bending angle up to: Smallest leg length: Smallest U-bending: Smallest Z-bending:

120 X 12 MM over 90° 50 mm 100 mm 72 mm (depending on material thickness)

Prod.-No.

03256

Prod.-No.

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

Punching: Punching Cu:

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

ALFRA busbar bending and punching machine - LPV

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

Accessories

Punches and dies available

Punch Ø mm	Metric screw connection

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. thic	ProdNo. kness	Dies -L- max	. mat. thickn	ProdNo. ess
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





Round punches and dies



AUTRA BUSBAR BENDING AND PUNGHING MAGHINE – 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.

Ø 6.6 - 21.5 mm

160 mm centric

390 x 150 x 330 mm

Prod.-No. 03853

Prod.-No. 02140

Prod.-No. 02121

L = 21 mm

12 mm

20 kg

- The angle scale is engraved in the upper section.
- Conversion from bending to punching is simple and easy.

Technical data:

Bending

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

including oblong holes up to max.

Punching Punching Cu max.:

Material thickness Cu max.: Material width up to: Dimensions L x W x H: Weight:

Recommended type of drive

Electro-hydraulic pump AHP 03-1 Air-hydraulic pump LHP 700 Foot pump

ALFRA BS 160 with bending die and bending punch R=11 mm for busbar 9-12 mm

Accessories

Bending punch R=5 mm for busbars 3-8 mm

Punches and dies available

Punch Ø mm	metric so	rew connection ProdNo.
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-		ProdNo.	Dies -l	L.	ProdNo.
max	. mat. thicl	kness	max	x. mat. thickne	955
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 = $21 \times 18 \text{ mm}$	ProdNo.
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



"Punching" position

Prod.-No.

03258

03259

Drad No

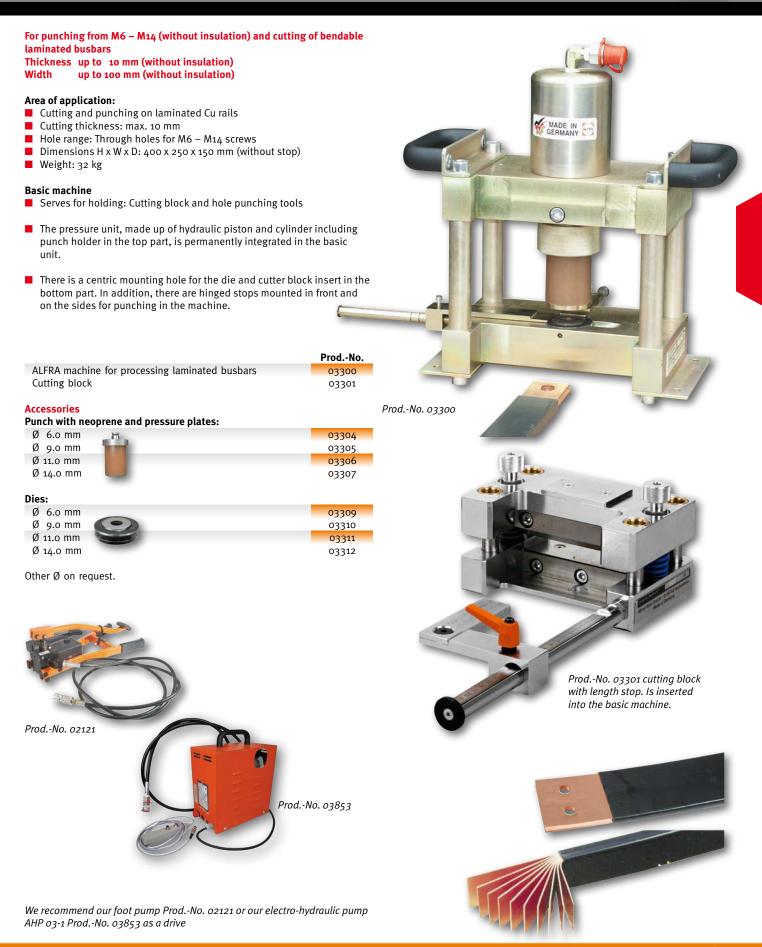
Prod.-No. 03258 "Bending" position



Complete (without punches and dies)

AUTRA - MACHINE FOR PROCESSING LAMINATED BUSBARS

Made in Germany by ALFRA



ALFRA



Technical data: Piston stroke:

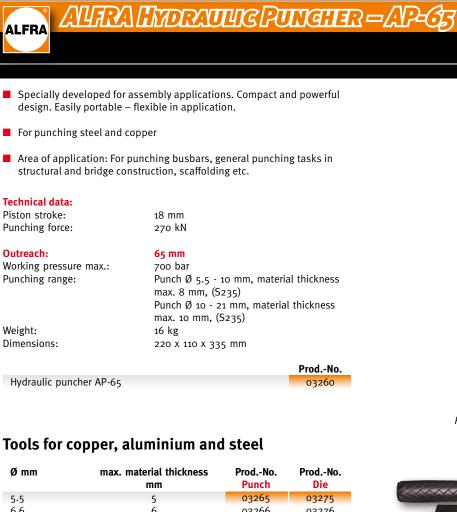
Punching force:

Punching range:

Outreach:

Weight:

Dimensions:



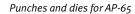
Ømm	max. material thickness mm	ProdNo. Punch	ProdNo. Die
5.5	5	03265	03275
6.6	6	03266	03276
8.0	6	03285	03290
9.0	8	03267	03277
11.0	10	03268	03278
14.0	10	03269	03279
18.0	10	03270	03280
21.0	10	03271	03281

Other Ø on request



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





AUTRA MADRAUUG HAND GRIMPING TOOL





C-form for easy handling

- C-form, pressing head can be turned through 320°, hydraulics integrated in the handle. Automatic switchover from quick feed to pressing feed.
- Built-in pressure control valve. For exchangeable hexagonal pressing inserts, half-shell shape.
- Supplied in a plastic case.

Technical data:

Pressing force:	130 kN
Pressure:	700 bar
Weight:	5.4 kg
Opening width:	26 mm
Length:	545 mm

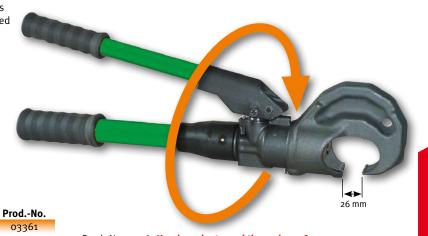
Hydraulic hand crimping tool

Hexagonal pressing inserts/cross-sections in mm²

Pressing form half-shell shape, for cable shoes and connectors

suitable for pressing tools 03360/03380/03361

Tool code	Pressing width	Copper	Aluminium	ProdNo.
8	14	16	-	03365
10	14	25		00066
10	14	25	_	03366
12	12	35	25	03367
14	12	50	35	03368
16	12	70	50	03369
18	12	95	70	03370
20	12	120	-	03371
22	14	150	95 + 120	03372
25	14	185	150	03373
28	14	240	185	03374
30	5	-	-	03375
32	5	300	240	03376
34	5	-	300	03377

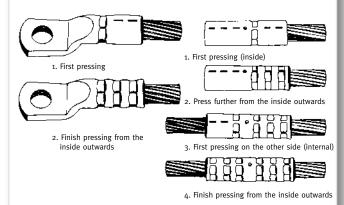


Prod.-No. 03361 Head can be turned through 320°



Hints on hexagonal pressings

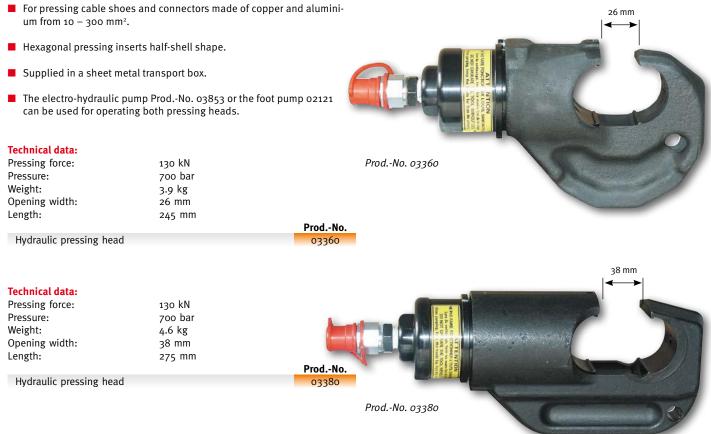
(manufacturer's instructions are decisive)





ALFRA MYDRAUUG GRIMPING HEADS

C-form for easy handling



Hexagonal pressing inserts/cross-sections in mm²

Pressing form half-shell shape, for cable shoes and connectors

suitable for pressing tools 03360/03380/03361

Tool	Pressing width	Copper	Aluminium	
code		,		ProdNo.
8	14	16	-	03365
10	14	25	-	03366
12	12	35	25	03367
14	12	50	35	03368
16	12	70	50	03369
18	12	95	70	03370
20	12	120	-	03371
22	14	150	95 + 120	03372
25	14	185	150	03373
28	14	240	185	03374
30	5	-	-	03375
32	5	300	240	03376
	5	_		
34	5	-	300	03377

AUTRA INDRAUUG CABUE CUMER - ANS 35



ALFRA



Advantages

- Guide cutting blade.
- Independent, can be used in any position.
- Clean cuts with minimum deformation.

Areas of application:

Energy companies, power distributor construction, telecommunications, municipal utilities and their service providers, crane construction, mining, shipbuilding, maintenance or repair etc.

55 kN

700 bar

450 mm

6.3 kg

Technical data:

Cutting force: Cutting pressure: Weight: Length:

Cutting capacity:

Telephone cable: Electric cable with armour: Insulated aluminium cable: (earthing cable) Insulated aluminium cable: (single conductor) Aluminium rope cable: Copper rope cable: up to Ø 85 mm up to Ø 85 mm 3 x 240 mm²

630 mm²

up to Ø 46 mm up to Ø 28 mm

Please specify your exact cable type (fine wire, solid, insulated...) – then we can check the cutting capacity.

Hydraulic cable cutter AKS 85 Supplied in a canvas bag

Prod.-No.

04002

AUTRA INDRAUUC IIAND CABUE CUTTER – IIKS 85

With integrated hand hydraulics for cutting cables up to Ø 85 mm

The most favourable working position can be selected thanks to the hydraulics located in the rotatable handle.

The cable cutter can be used independently of hydraulic pumps on scaffolds, high-voltage poles or down shafts etc.

Areas of application:

Energy companies, power distributor construction, telecommunications, municipal utilities and their service providers, crane construction, mining, shipbuilding, maintenance or repair etc.

Technical data:

55 kN 700 bar 6.6 kg 740 mm

The cutting capacity data correspond to type AKS 85.

Hydraulic hand cable cutter HKS 85 Supplied in a canvas bag



Prod.-No. 04015 Head can be turned through 320°

Prod.-No. 04015



Prod.-No. 04002



Made in Germany by ALFRA







ALFRA ALERA PRESS - OVERVIEW

	ALFRA PRESS AP 250	ALFRA PRESS AP 400			
	Page 56	Page 58			
	Control cabinet housing, control cabinet doors, mounting plates	Control cabinet housing, control cabinet doors, mounting plates			
ProdNo.	03170	03195			
Outreach with stop in mm	250	400			
Overall height in mm	820	1,700			
Total weight approx.	50	220			
Space required in mm	1,000 X 1,000	1,200 X 800			
Tool dimensions in mm:					
Round Ø	3.2 - 40.5	3.2 - 40.5			
Square up to	28.0 X 28.0	28.0 x 28.0			
Rectangular up to	22.0 X 30.0	22.0 X 30.0			
Max. diagonals from	40.0	40.0			
Max. material thickness in mm:					
Steel S235 / stainless steel	2.5 / 2.0	2.5 / 2.0			
Aluminium / plastic	4.0	4.0			
Hydraulic system:					
Mode of operation	single-acting	single-acting			
Punching force F	46 kN at 600 bar	46 kN at 600 bar			
Punching stroke in mm	50	50			
Operating voltage	•				
Workpiece chamfer in mm	22	22			

AUTRA PRESS - OVIERVIEV



ALF	TRA PRESS AP 500	ALFRA PRESS AP 600-2	ALFRA PRESS AP 800
	Page 60	Page 62	Page 64
	Control cabinet doors, mounting plates, various control cabinet housings	Control cabinet doors, mounting plates	Control cabinet doors, mounting plates
	03093	03090	03400
	500	600	800
	1,500	1,600	1,700
	200	360	850
	1,500 x 1,500 mm	2,000 x 3,000	2,360 x 4,440
	3.2 - 63.5	3.2 - 70.0	3.2 - 120.0
	46.0 x 46.0	68.0 x 68.0	110.0 X 110.0
	36.0 x 52.0	36.0 x 65.0	46.0 x 92.0
	64.0	90.0	140.0
	3.0 / 2.0	3.0 / 2.0	3.0 / 2.0
	4.0	4.0	4.0
	double-acting	double-acting	double-acting
	48 kN at 130 bar	60 kN at 165 bar	135 kN at 190 bar
	66	66	72
	220	400	400
	30	30	40

55



AUTRA PRESSAP 250

Made in Germany by ALFRA



ALFRA

For the quick punching out of round, square, rectangular or special shapes without pre-drilling in control cabinet doors, terminal boxes, cable ducts, housings, cable guiding plates etc. up to the edge area. Tool change is easy and can be done in seconds.

Description:

- For flexible use on a mobile frame (optional) or mounted stationary on the workbench.
- Quick tool change helps in case of problems with many through-hole variants.
- Different die holders are available – also for punching right up to the edge.
- Punching in a row is no problem thanks to attachable fold-away stops. Tip: Use the laser pointer as an option - no marking,
- no centre-punching, a simple cross-hair with a pen is enough. As an "entry level solution", operation by means of a manual pump is
- even enough for "punching without pilot drilling" at a favourable price.

Technical data:	
Outreach with stop:	250 mm
Outreach without stop:	265 mm
Punching stroke:	50 mm
Punching force F:	46 kN at 600 bar
Hydraulic connection:	R 1/4"
Weight without frame:	50 kg
Weight with frame:	120 kg
Space required with frame approx.:	Ø 1,000 mm
Punching capacity:	
Round	Ø 3.2 - 40.5 mm

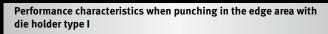
Rouna	Ø 3.2 - 40.5 mm
Square	28.0 x 28.0 mm
Rectangular	22.0 X 30.0 mm
Special shapes up to a	
max. diagonal of	40.0 mm
Material thicknesses (max.):	
Mild steel (S235)	2.5 mm
Stainless steel (F = 600 N/mm²)	2.0 mm
Aluminium (F = 22 N/mm²)	4.0 mm
Punchable plastics	4.0 mm

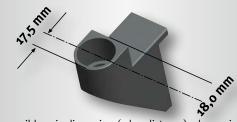
ALFRA PRESS AP 250 (without options)

Please note:

■ All the round tools for ALFRA PRESS punches AP 250 - AP 800 are made of special tool steel and have a special cutting geometry developed by ALFRA.

Special tools can be made at short notice in our own tool-making department!





Smallest possible axis dimension (edge distance) when using die holder type I Prod.-No. 03174



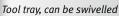


Laser pointer for the optical indication of the tool centre

Cylinder prepared for the installation of a laser pointer

Limit switch for stroke limit (option)

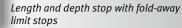






Prod.-No.

03170

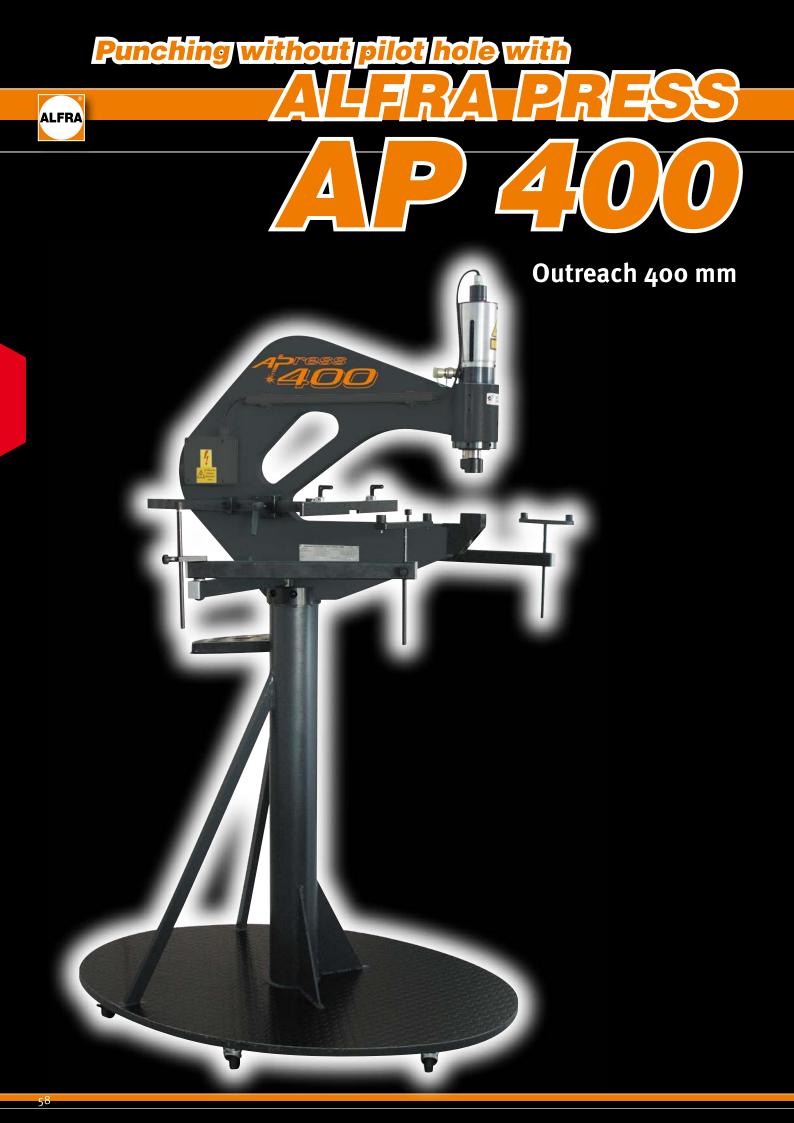




Swivelled support arms, adjustable height with 2 rubber supports each (option)



We recommend our electro-hydraulic pump ALH-600 Prod.-No. 03190 as a drive.



AUTRA PRESSAP (700

Made in Germany by ALFRA





For the quick punching out of round, square, rectangular or special shapes without pre-drilling in control cabinet doors, terminal boxes, cable ducts, housings, cable guiding plates etc. up to the edge area. Tool change is easy and can be done in seconds.

Description:

- For flexible use on a mobile frame.
- Quick tool change helps in case of problems with many through-hole variants.
- Different die holders are available also for punching right up to the edge.
- Punching in a row is no problem thanks to attachable fold-away stops.
- Tip: Use the laser pointer as an option no marking,
- no centre-punching, a simple cross-hair with a pen is enough. As an "entry level solution", operation by means of a manual pump is even enough - for "punching without pilot drilling" at a favourable price.

Prod.-No.

0319

2.5 mm

2.0 mm

4.0 mm

4.0 mm

Technical data:	
Outreach with stop:	400 mm
Outreach without stop:	430 mm
Punching stroke:	50 mm
Punching force F:	46 kN at 600 bar
Hydraulic connection:	R 1/4"
Weight:	220 kg
Space required with frame approx.:	1,200 x 800 mm
Punching canacity	

Functing capacity:	
Round from	Ø 3.2 - 40.5 mm
Square up to	28.0 x 28.0 mm
Rectangular up to	22.0 X 30.0 MM
Special shapes up to a	
max. diagonal of	40.0 mm

Material thicknesses (max.): Steel sheets (S235) Stainless steel (F = 600 N/mm²) Aluminium (F = 22 N/mm^2) **Punchable plastics**

ALFRA PRESS AP 400 (without options)

Please note:

die holder type I

■ All the round tools for ALFRA PRESS punches AP 250 - AP 800 are made of special tool steel and have a special cutting geometry developed by ALFRA.

Special tools can be made in our own workshop at short notice!



Swivelled support arms, adjustable height with 3 rubber supports each (option)



We recommend our electro-hydraulic pump ALH-600 Prod.-No. 03190 as a drive.

28,0 mm Smallest possible axis dimension (edge distance) when using die holder type I Prod.-No. 03174

Performance characteristics when punching in the edge area with



Cylinder prepared for the installation of a laser pointer

Die holder type II

Tool tray, can be swivelled

Length and depth stop with fold-away limit stops

(option)



AUTA PRESSAP 500

Made in Germany by ALFRA

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The stationary punching machine was developed for control cabinet and switchgear manufacturers, for the quick punching of round, square, rectangular or special shapes in metal sheets and control cabinet doors up to 2000 mm x 1000 mm and 30 mm folding height. Punching up to the edge is possible. Tool change is quick and easy and can be done in seconds. Control cabinets/housings from 300 mm depth onwards can also be machined.

Description:

- Stable pressing body with adjustable feet.
- Double-acting hydraulic cylinder, flanged on machine body using force and positive connection.
- Piston rod Ø 55 mm in a torsion-resistant position, made of hardened stainless steel with tool holder.
- Die seat, friction-locked to the pressing body.
- Quick tool change helps in case of problems with many through-hole variants.
- Blank holder with protective function, fixed with electric safety locking for accident prevention.
- Vertically adjustable length and depth stop available in 2 versions.
- Measuring tape indication for length and depth stop.
- Dual-circuit hydraulic unit with electric pump, oil tank and solenoid valves (very quiet).
- Safety foot switch with double pedal for the infinitely variable operation of the punching and return stroke.

500 mm 540 mm

66 mm

0.37 kW 220 V 200 kg 1,500 mm 1,000 mm 130 mm 950 mm 1,500 mm 1,500 x 1,500 mm Ø 3.2 - 63.5 mm 46.0 x 46.0 mm

60.0 mm

3.0 mm

2.0 mm

4.0 mm 4.0 mm

Prod.-No.

48 kN at 130 bar

Tip: Use the laser pointer as an option – no marking, no centre-punching, a simple cross-hair with a pen is enough.

Technical data:

Outreach with stop:
Outreach without stop:
Punching stroke:
Punching force F:
Motor output:
Operating voltage:
Weight approx.
Overall height:
Working height:
Width of the punching body:
Depth of the punching body:
Length of the stop rail:
Approx. space requirements:
Punching capacity:
Round from
Square up to
Special shapes up to a
max. diagonal of

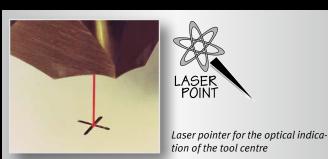
Material thicknesses (max.): Steel sheets (S235) Stainless steel (F = 600 N/mm²) Aluminium (F = 22 N/mm²) Punchable plastics

ALFRA PRESS AP 500 (without options)

Please note:

All the round tools for ALFRA PRESS punches AP 250 - AP 800 are made of special tool steel and have a special cutting geometry developed by ALFRA.

Special tools can be made at short notice in our own tool-making department!











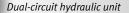


Electric safety locking for accident prevention

Stop system can be moved in Y-direction, 2 guide shafts in the pressing body.

Die seat holder

Measuring tape indication for Y-axis





AUTRA PRESSAP 600-2

Made in Germany by ALFRA





The stationary punching machine was developed for control cabinet and switchgear manufacturers, for the quick punching of round, square, rectangular or special shapes in metal sheets and control cabinet doors up to 2200 mm x 1000 mm and 30 mm folding height. Punching up to the edge is possible. Tool change is quick and easy and can be done in seconds even with the door inserted. Stop system can be moved in X- and Y-direction.

Description:

- Sturdy pressing body in robust, torsion-resistant welded structure.
- Double-acting hydraulic cylinder, flanged on machine body using force and positive connection.
- Piston rod Ø 55 mm in a torsion-resistant position, made of hardened stainless steel with tool holder.
- Die seat, friction-locked to the pressing body.
- Quick tool change helps in case of problems with many through-hole variants.
- Blank holder with protective function, fixed with electric safety locking for accident prevention.
- Length and depth stop can be moved in X- and Y-direction, mounted in hardened double spherical guides for smooth movement.
- Measuring tape indication for length and depth stop.
- Digital measuring indicator for X- and Y-axis available as an option.
- Dual-circuit hydraulic unit with electric pump, oil tank and solenoid valves (very quiet). Safety foot switch with double pedal for the infinitely variable operation
- of the punching and return stroke.

600 mm

66 mm 60 kN at 165 bar

0.75 KW 400 V

360 kg

310 mm

1,600 mm

1,000 mm

1.150 mm

1,500 mm 2,000 x 3,000 mm

90.0 mm

3.0 mm

2.0 mm

4.0 mm

4.0 mm

Prod.-No.

03090

Ø 3.2 - 70.0 mm

68.0 x 68.0 mm

Tip: Use the laser pointer as an option – no marking, no centre-punching, a simple cross-hair with a pen is enough.

Technical data:

Outreach with stop: **Punching stroke: Punching force F:** Motor output: **Operating voltage:** Weight approx. Overall height: Working height: Width of the punching body: Depth of the punching body: Length of the stop rail: Approx. space requirements:

Punching capacity: Round from Square up to Special shapes up to a max. diagonal of

Material thicknesses (max.): Steel sheets (S235) Stainless steel (F = 600 N/mm²) Aluminium ($F = 22 \text{ N/mm}^2$) Punchable plastics up to

ALFRA PRESS AP 600-2 (without options)

Please note:

All the round tools for ALFRA PRESS punches AP 250 - AP 800 are made of special tool steel and have a special cutting geometry developed by ALFRA.

Special tools can be made at short notice in our own tool-making department!

















Laser pointer for the optical indication of the tool centre

Sturdy piston rod (Ø 55 mm) with anti-twist tool protection

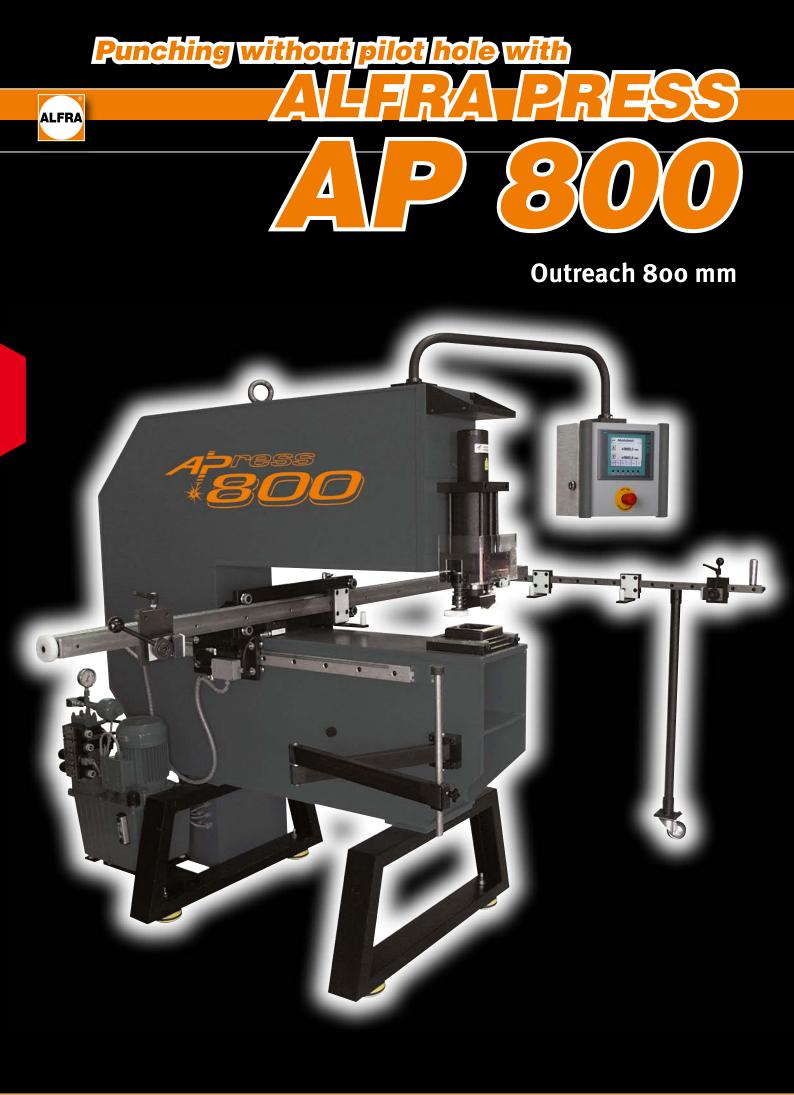
Tool drawer with compartments

Dual-circuit hydraulic unit in the cabinet base

Mutual auick-clampina system for folding up or down as required

Die seat holder. Tool change possible even with a control cabinet door clamped in place.

Length and depth stop routed on both sides in double spherical guides. 2 adjustable stops each on the right and left of the Y-axis.



AUTA PRESSAP 800

Made in Germany by ALFRA

ALFRA

The stationary punching machine was developed for control cabinet and switchgear manufacturers, for the quick punching of round, square, rectangular or special shapes in metal sheets and control cabinet doors up to 2200 mm x 1000 mm and 40 mm folding height. Punching up to the edge is possible. Tool change is quick and easy and can be done in seconds – even with the door inserted. Stop system can be moved in X- and Y-direction.

Description:

- Sturdy pressing body in robust, torsion-resistant welded structure
- mounted on stationary frame with rubber-bonded metal feet. Swivel control desk with digital display, emergency off button, electric operating buttons and two-handed control.
- Double-acting hydraulic cylinder, flanged on machine body using positive connection and force fit.
- Piston rod Ø 63 mm in a torsion-resistant position, made of hardened stainless steel with tool holder.
- Die seat, friction-locked to the pressing body.
- Time relay for piston return saves working time.
- Blank holder/stripper combination with finger protection.
- X Y stop system, easy to move, in sturdy and precise profile roller guides.
- Positive and frictional workpiece support and clamping device.
- Swivelling workpiece support on the left of the pressing body for easy lifting of the workpiece.
- Stop system locking by electrically operated hydraulic brakes.
- Digital distance measurement and display of the X- and Y-travel paths with a display accuracy of 0.1 mm and a measuring accuracy of 1 ‰.
- Quick tool change helps in case of problems with many through-hole variants.
- Dual-circuit hydraulic unit with electric pump, oil tank and solenoid valves, very quiet.
- Tip: Use laser pointer as option for the optical indication of the tool centre.

Technical data:
Outreach with stop:
Punching stroke:
Punching force F:
Motor output:
Operating voltage:
Weight approx.
Overall height:
Working height:
Width of the punching body:
Depth of the punching body:
Approx. space requirements:

Punching capacity: Round from Square up to Special shapes up to a max. diagonal of

Material thicknesses (max.): Steel sheets (S235) Stainless steel (F = 600 N/mm²) Aluminium ($F = 22 \text{ N/mm}^2$) Punchable plastics up to

72 MM 135 kN at 190 bar 1.5 kW 400 V 850 kg 1,700 mm 1,000 mm 280 mm 1,700 mm 2,360 x 4,440 mm

800 mm

Ø 3.2 - 120.0 mm 110.0 X 110.0 mm

Prod.-No.

140.0 mm

3.0 mm 2.0 mm 4.0 mm 4.0 mm

ALFRA PRESS AP 800 (without options)

Special tools can be made at short notice in our own tool-making department!









Tool holder, anti-twist-protected in the piston rod, blank holder/stripper combination.

Positive and frictional workpiece sup-

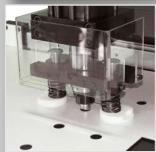
port with quick-clamping system

Swivel control desk with two-handed operation



Distance measurement of X- and Y-travel paths





Dual-circuit hydraulic unit

Blank holder/stripper combination

ALARA HSS BEMETAL

Features:

M42

ALFRA

- High concentricity
- With solid base plate, thus more threads and higher stability as well as concentric running exactness.
- For material from 2 mm with positive chipping and cutting angles as well as combi-toothing 4/6 tpi. This variable spacing provides a more even cut, for a minor generation of vibrations and heat. Lower expenditure of energy when cutting.
- Cutting Depth: 38 mm (1-1/2").
- Lateral slots help to remove the core.
- Suitable for unalloyed steel (up to 700 N/mm2), nonferrous metals, light metals, plastics, gypsum, pulp wood- and plywood boards, lightweight building boards and general wood processing.
- Drill bit exchangeable with other commercially available arbors.



HOLESAWS







Also steel/stainless steel up to approx. 3 mm, can be worked easily (for frequent use, we recommend our TCT Hole Saws).



... designed to work on softwoods.



ALFRA – HSS-BI-METAL HOUESAWS

ALFRA HSS-Bi-Metal Hole Saws are applicable in portable and pillar drilling machines. When using pillar drilling machines, use manual feed only.

Features:

- M42
- High concentricity.
- With solid base plate, thus more threads and higher stability as well as concentric running exactness.
- With positive chipping and cutting angles as well as combi-toothing 4/6 tpi. This variable spacing provides a more even cut, for a minor generation of vibrations and heat. Lower expenditure of energy when cutting.
- Cutting Depth: 38 mm (1-1/2").
- Lateral slots help to remove the core.
- Suitable for unalloyed steel (up to 700 N/mm2), nonferrous metals, light metals, plastics, gypsum, pulp wood- and plywood boards, lightweight building boards and general wood processing.
- Drill bit exchangeable with other commercially available arbors.

Tip:

Start drilling operation with light pressure. Continue with light and steady pressure, avoid pendulum motion, follow the speed chart, use coolant. When cutting wood or wood substitutes, remove drill dust in time.

Saw Ø mm	Inches	ProdNo.
14.0	9/16"	0500014
16.0	5/8"	0500016
17.0	11/16"	0500017
19.0	3/4"	0500019
20.0	15/19"	0500020
21.0	13/16"	0500021
22.0	7/8"	0500022
24.0	15/16"	0500024
25.0	1"	0500025
27.0	11/16"	0500027
29.0	1-1/8"	0500029
30.0	1-3/16"	0500030
32.0	1-1/4"	0500032
33.0	1-5/16"	0500033
35.0	1-3/8"	0500035
37.0	1-7/16"	0500037
38.0	1-1/2"	0500038
40.0	1-9/16"	0500040
41.0	1-5/8"	0500041
43.0	1-11/16"	0500043
44.0	1-3/4"	0500044
46.0	1-13/16"	0500046
48.0	1-7/8"	0500048
51.0	2"	0500051
52.0	2-1/16"	0500052
54.0	2-1/8"	0500054
57.0	2-1/4"	0500057
59.0	2-5/16"	0500059
60.0	2-3/8"	0500060
64.0	2-1/2"	0500064
65.0	2-9/16"	0500065
67.0	2-5/8"	0500067
68.0	2-11/16"	0500068
70.0	2-3/4"	0500070
73.0	2-7/8"	0500073



Combi toothing 4/6 tpi



from Ø 14.0 to 210 mm available



AUTRA-ISS BI-METAL HOUE SAWS



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Important: Disable impact drill position when using SDS-shanks!
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Prod.-No. 0502004

ALFRA



The following HSS-Bi-Metal Hole Saw Sets enlarge our range. These sets were especially compiled for electricians, mechanics, plumbers and for general, universal applications. These sets improve the presentation. Storage in solid tool cases.

Hole Saw Set Standard

Prod.-No. 0503006

Prod.-No. 0503007

Contents:

- Ø 16 mm (5/8") Ø 19 mm (³/₄") Ø 22 mm (7/8") Ø 29 mm (1 1/8") Ø 35 mm (1 ³/₈") Ø 44 mm (1 ³/₄") Ø 52 mm (2 ¹/₁₆") \emptyset 57 mm (2 $\frac{1}{4}$ ") Ø 67 mm (2 5/8")
- Arbor A6-SS, Arbor A2-SS, Spare Twist Drill

Hole Saw Set Professional

Contents:

Ø 16 mm (5/8") Ø 19 mm $({}^{3}/_{4}")$ Ø 22 mm $({}^{7}/_{8}")$ Ø 25 mm (1") Ø 29 mm (1 ¹/₈") Ø 32 mm (1 1/4") Ø 35 mm (1 3/8") Ø 38 mm (1 1/2") Ø 44 mm (1 ³/₄") Ø 51 mm (2") Ø 64 mm (2 1/2") Ø 76 mm (3") Arbor A6-SS, Arbor A2-SS, Spare Twist Drill

Hole Saw Set Electro

Contents: \emptyset 22 mm (7/8") Ø 29 mm (1 1/8") Ø 35 mm (1 3/8") Ø 44 mm (1 ³/₄") Ø 51 mm (2") Ø 64 mm (2 1/2") Ø 68 mm (2 ¹¹/₁₆") Arbor A6-SS, Arbor A2-SS, Spare Twist Drill

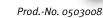
Hole Saw Set Sanitary

Contents: Ø 16 mm (5/8") Ø 19 mm (³/₄") Ø 24 mm (15/16") \emptyset 29 mm (1 $\frac{1}{8}$ ") Ø 38 mm (1 1/2") Ø 44 mm $(1 \frac{3}{4})$ Ø 57 mm $(2 \frac{1}{4})$ Ø 67 mm (2 5/8")

Arbor A6-SS, Arbor A2-SS, Spare Twist Drill

Prod.-No. 0503009

Prod.-No. 0503008





Prod.-No. 0503009



Prod.-No. 0503006



Prod.-No. 0503007











TCT-Hole Saws – short-/long type





Stainless steel

Plastic

ALFRA



Poroton brick stone



TCT-Hole Saws – FRP





TCT-Hole Saws – MBS type



Sanitary pipes – type SML



MBS Pro Use on Rotabest Magnetic Drilling Machine with MT3 – Arbor Prod.-No.: 0734003



Checker plate (stainless steel)

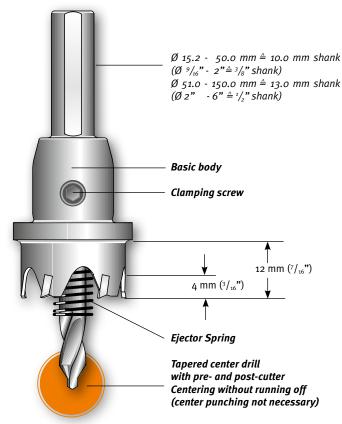


Sanitary pipes – type SML



ALFRA TETHOUS SAVIS – STORT TAPE

Made in Germany by ALFRA



The application area of TCT Hole Saws differs from HSS-Bi-Metal Hole Saws. With ALFRA TCT Hole Saws, suitable to economically process stainless steel up to 2 mm ($_1/16$ "), unalloyed steels up to 4 mm ($_3/16$ "), plastics, PVC, aluminium, zinc, gypsum plaster boards and lightweight building boards, as well as asbestos. Do not use automatic feed, when working with pillar drilling machines. For the use on portable- and pillar drilling machines.Do not use automatic feed, when working with pillar drilling machines.

Features:

- High concentric running exactness through solid construction.
- CAD-optimized cutting angles with specially ground section ensures high cutting capacity and long tool life.
- Quick removal of drilled core through ejector spring for all hole saws up to 150 mm (5-29/32") Ø.
- Carbide tipping enables repeated re-grinding.
- ALFRA hole saws are repairable. In the event of a tooth breaking, it can easily be replaced and resharpened.
- Exchangeable center pin.
- Use of MT tool holders from \emptyset 31 mm (1-7/32").
- For use on hand drilling machines (recommended up to max. Ø 40 mm; 1-9/16") or stationary machines.

Tips:

- At thicker materials: cut 2-3 mm per cutting process, remove chips afterwards.
- When cutting metals, a high- grade cutting oil should be used. Exception: Do not use cutting oil when using cast iron, use parrafin instead of oil when cutting aluminium.
- Keep in mind: Always wear safety goggles.

Another special technical feature:

From Ø 15.2 mm (3/16") to 30.0 mm (1 1/8"), the hole saw is made of one piece.

From Ø 31.0 mm (1-3/16") we use specially hardened tool holders to compensate for the torsional power in case of heavy operation, which avoids early shearing off of the tool holder shank.

In terms of construction not comparable with any other make.









AUTRA TETHIOUESAWS – SHORT TYPE

Made in Germany by ALFRA



ø	ø	No. of	ProdNo.
mm	Inches	teeth	mm
Ø 77.0		13	0600770
Ø 78.0		14	0600780
Ø 79.0	3-1/8"	14	0600790
Ø 80.0		14	0600800
Ø 81.0	3-3/16"	14	0600810
Ø 82.0		14	0600820
Ø 83.0	3-1/4"	14	0600830
Ø 84.0	3-5/16"	15	0600840
Ø 85.0		15	0600850
Ø 86.0	3-3/8"	15	0600860
Ø 87.0	3-7/16"	15	0600870
Ø 88.0		15	0600880
Ø 89.0	3-1/2"	16	0600890
Ø 90.0	3-9/16"	16	0600900
Ø 91.0		16	0600910
Ø 92.0	3-5/8"	16	0600920
Ø 93.0		16	0600930
Ø 94.0	3-11/16"	16	0600940
Ø 95.0	3-3/4"	17	0600950
Ø 96.0		17	0600960
	3-13/16"	17	0600970
Ø 98.0	3-7/8"	17	0600980
Ø 99.0		17	0600990
	3-15/16"	17	0601000
Ø 105.0	4"	18	0601050
Ø 110.0		18	0601100
Ø 115.0	4-1/2"	20	0601150
Ø 120.0		20	0601200
Ø 125.0		20	0601250
Ø 130.0	5"	20	0601300
Ø 135.0		24	0601350
Ø 140.0	5-1/2"	24	0601400
Ø 145.0		24	0601450
Ø 150.0		24	0601500
		•••	

HSS-Spare Drill

 with tapered center tip

 from Ø 15.2 - 100.0
 Ø 6x50 mm
 0602650

 from Ø 101.0 - 150.0
 Ø 8x50 mm
 0602850

MT Arbors

300 ml





Prod.-No. 0600001

Set Metric

Set Metric

Prod.-No. 0600001

Contents: 1 each of Ø 16/20/25/32/40 mm 2 Allen Keys





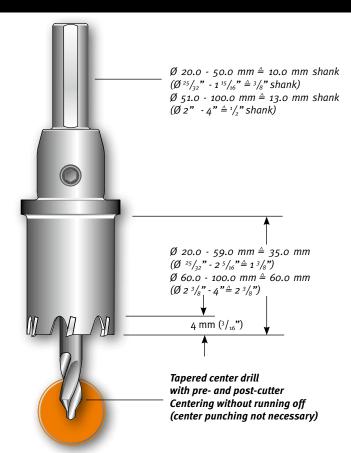
21040





ALFRA TETHIOUS SAUS – LONG TAPE

Made in Germany by ALFRA





Features:

- Especially developed for the use on pipes, vaulted materials, for unalloyed and alloyed steels, nonferrous metals, plastics as well as glass fibre reinforced plastic.
- For material thickness up to 4 mm (3/16"), 2 mm (1/16") stainless steel.
- For use on hand drilling machines, recommended up to max. Ø 40 mm (1-9/16") or stationary machines.

Tips:

- Start drilling operation with light pressure, when drilling pipes. Avoid pendulum motions.
- Keep in mind: Always wear safety goggles.



Special tools for special applications on request!

AUTRA TETHIOUESAWS - LONG TAPE

Made in Germany by ALFRA

Ø mm	Ø Inches	No. of teeth	ProdNo. mm	Ø mm	Ø Inches	No. of teeth	ProdNo. mm	Ø mm
Ø 16.0	5/8"	4	0700160	Ø 54.0	2-1/8"	12	0700540	Ø 92.0
Ø 17.0		4	0700170	Ø 55.0		12	0700550	Ø 93.0
Ø 18.0	11/16"	4	0700180	Ø 56.0	2-3/16"	12	0700560	Ø 94.0 3
Ø 19.0	3/4"	4	0700190	Ø 57.0	2-1/4"	12	0700570	Ø 95.0
Ø 20.0		5	0700200	Ø 58.0		12	0700580	Ø 96.0
Ø 21.0	13/16"	5	0700210	Ø 59.0	2-5/16"	12	0700590	Ø97.0 3
Ø 22.0		5	0700220	Ø 60.0	2-3/8"	14	0700600	Ø 98.0
Ø 23.0	7/8"	5	0700230	Ø 61.0		14	0700610	Ø 99.0
Ø 24.0	15/16"	6	0700240	Ø 62.0	2-7/16"	14	0700620	Ø 100.0 3
Ø 25.0		6	0700250	Ø 63.0		14	0700630	
Ø 26.0	1"	6	0700260	Ø 64.0	2-1/2 "	14	0700640	
Ø 27.0	1-1/16"	6	0700270	Ø 65.0		14	0700650	
Ø 28.0		6	0700280	Ø 66.0	2-9/16"	14	0700660	
Ø 29.0	1-1/8"	6	0700290	Ø 67.0	2-5/8"	16	0700670	
Ø 30.0	1-3/16"	6	0700300	Ø 68.0		16	0700680	HSS-Sp
Ø 31.0		8	0700310	Ø 69.0	2-11/16"	16	0700690	with tapere
Ø 32.0	1-1/4"	8	0700320	Ø 70.0	2-3/4"	16	0700700	
Ø 33.0		8	0700330	Ø 71.0		16	0700710	von Ø 20.
Ø 34.0	1-5/16"	8	0700340	Ø 72.0	2-13/16"	16	0700720	von Ø 60.
Ø 35.0	1-3/8"	8	0700350	Ø 73.0	2-7/8"	16	0700730	
Ø 36.0		8	0700360	Ø 74.0		16	0700740	MT Arbo
Ø 37.0	1-7/16"	8	0700370	Ø 75.0		16	0700750	
Ø 38.0		8	0700380	Ø 76.0	3"	18	0700760	
Ø 39.0	1-1/2 "	8	0700390	Ø 77.0		18	0700770	
Ø 40.0	1-9/16 "	10	0700400	Ø 78.0	3-1/16"	18	0700780	(
Ø 41.0		10	0700410	Ø 79.0	3-1/8"	18	0700790	
Ø 42.0	1-5/8"	10	0700420	Ø 80.0		18	0700800	MT-2 (ab
Ø 43.0	1-11/16"	10	0700430	Ø 81.0	3-3/16"	18	0700810	MT-3 (ab
Ø 44.0		10	0700440	Ø 82.0		18	0700820	
Ø 45.0	1-3/4"	10	0700450	Ø 83.0	3-1/4"	18	0700830	
Ø 46.0		10	0700460	Ø 84.0	3-5/16"	20	0700840	SDS Art
Ø 47.0	1-13/16"	10	0700470	Ø 85.0		20	0700850	
Ø 48.0	1-7/8"	10	0700480	Ø 86.0	3-3/8"	20	0700860	SDS arbor
Ø 49.0		10	0700490	Ø 87.0	3-7/16"	20	0700870	(for use w
Ø 50.0	1-15/16"	12	0700500	Ø 88.0		20	0700880	
Ø 51.0	2"	12	0700510	Ø 89.0	3-1/2"	20	0700890	
Ø 52.0		12	0700520	Ø 90.0	3-9/16"	20	0700900	
Ø 53.0	2-1/16"	12	0700530	Ø 91.0		20	0700910	

Ø mm	Ø Inches	No. of teeth	ProdNo. mm
Ø 92.0	3-5/8"	20	0700920
Ø 93.0		20	0700930
Ø 94.0	3-11/16"	22	0700940
Ø 95.0	3-3/4"	22	0700950
Ø 96.0		22	0700960
Ø 97.0	3-13/16"	22	0700970
Ø 98.0	3-7/8"	22	0700980
Ø 99.0		22	0700990
Ø 100.0	3-15/16"	22	0701000

ALFRA

von Ø 20.0 - 59.0 Ø 6x80 mm	070268
von Ø 60.0 - 100.0 Ø 8x100 mm	070280
MT Arbors	
	_
MT-2 (ab Ø 31.0)	072400
MT-2 (ab Ø 31.0) MT-3 (ab Ø 31.0)	073400
	07 5400
SDS Arbor	
SUS AIDOI	
SDS arbor shank	o6osds
(for use with Ø 31 - 59 mm)	

HIGHN/RECOMMENDET/ACCESSORIES = COOVANIT/AND LUBRICANIT/

ALFRA 2000

ALFRA 2000 is a fully synthetic cutting oil, developed for high-quality cutting, threading and drilling of metals of any degree of hardness, ferrous metal, steel alloys, stainless steel, copper, aluminium and their alloys. ALFRA BIO 2000 is free of hydrocarbon, sulphur and chlorine.



ALFRA 3000

Universal metal working oil free of chlorine. High-performance drilling, broaching and cutting fluid, petroleumbased, for moderately difficult and difficult to cut steels. With a high proportion of active ingredients to ensure optimum cutting performance and significantly reduced tool wear. It meets occupational health and safety requirements.

We recommend to use ALFRA 3000 especially for the drilling and threading of high-alloy steel and chrome nickel steel.



Prod.-No.

ALFRA 4000

Suitable for core drilling applications with ALFRA cutters. Also ideal for twist drilling, thread tapping, reaming, countersinking, and difficult cutting applications. It meets to the requirements of work hygiene and safety.

ALFRA 4000 is a pump spray, free from propellant gas ideal for drilling and tapping of high-alloy, stainless steels; chromium nickel steels; titanium and manganese-carbon steels



Aerosol can 405 ml
5 ltr. Plastic container
60 ltr. Barrel

ProdNo.	
21010	Aerosol can 520 ml
21012	5 ltr. Plastic container
21021	60 ltr. Barrel

21030 21031 21032

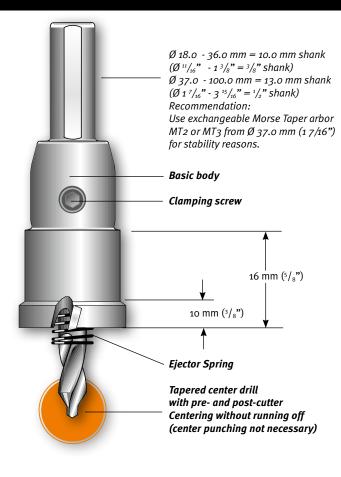






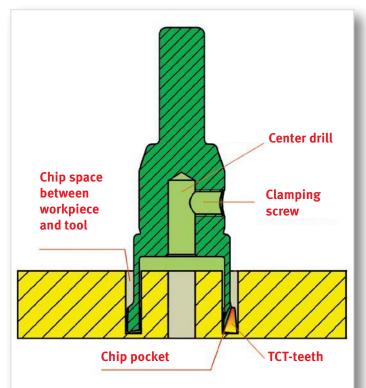
AUTRA TGTHIOUS SAWS – MDS-UIGHT

The TCT Multirange Hole Saw • Registered Utility Model No. 202 03 232 9 • Made in Germany by ALFRA





MBS – for almost limitless use



This TCT Hole Saw is a multi-range Hole Saw for the universal use up to a material thickness of max. 10 mm (3/8") (without ejector spring). Through its solid construction and an enhanced cutting geometry (Registered Utility Model No. 202 03 232 9), an improved cutting behaviour combined with a high cutting capacity and tool life, is achieved.

For the use on flat steel, as well as on pipes and vaulted materials. Cutting of overlapping holes is possible.

For use on stationary and hand drilling machines (recommended up to max. Ø 40 mm; 1 9/16").

Portable drilling Machines: up to 4 mm (1/8") material thickness
 Stationary drilling Machines: up to 10 mm (3/8") material thickness (for material thickness over 6 mm (15/64"), it is necessary to

settle and empty the chips several times).

In case of heavy operation, we recommend Morse Taper Tool Holders, which are suitable from Ø 37 mm (1 7/166").

Advantage: All MBS-Light type TCT Hole Saws are equipped with an ejector spring.

The cut material is self-ejecting. The cut material is self-ejecting.

Another special technical feature: From Ø 37 mm (17/16"), specially hardened tool holders are used to compensate for the torsional power in case of heavy operation which avoids early shearing off of the tool holder shank.

In terms of construction not comparable with any other make.



AUTRA TOTHIOUS SAVIS - MBS-UGHT

The TCT Multirange Hole Saw • Registered Utility Model No. 202 03 232 9 • Made in Germany by ALFRA

I	Ø mm	Ø Inches	No. of teeth	ProdNo. mm
Ø	18.0	11/16"	6	0730018
Ø	19.0	3/4"	6	0730019
	20.0	1.41	6	0730020
Ø	21.0	13/16"	6	0730021
Ø	22.0	7/8"	6 6	0730022
Ø	23.0 24.0	15/16"	6	0730023 0730024
ø	25.0	1),10	6	0730025
Ø	26.0	1"	6	0730026
Ø	27.0	1-1/16 "	6	0730027
Ø	28.0		6	0730028
Ø		1-1/8"	6	0730029
Ø	30.0	1-3/16"	6 6	0730030
Ø	31.0 32.0	1-1/4"	6	0730031
ø	33.0	1-1/4	6	0730032 0730033
ø	34.0	1-5/16"	6	0730034
Ø	35.0	1-3/8"	6	0730035
Ø	36.0		6	0730036
			-7/16") v	ve recommend the
		l arbors		
Ø		1-7/16"	6	0730037
Ø	38.0	4.4/2"	6	0730038
Ø		1-1/2" 1-9/16"	6 6	0730039
ø	41.0	1-9/10	6	0730040 0730041
Ø	42.0	1-5/8"	6	0730042
ø		1-11/16"	6	0730043
Ø	44.0		6	0730044
Ø	45.0	1-3/4"	6	0730045
Ø	46.0		6	0730046
Ø		1-13/16"	6	0730047
Ø		1-7/8"	6	0730048
Ø	49.0	1-15/16"	6 6	0730049
ø	51.0	2"	6	0730050 0730051
Ø	52.0	-	6	0730052
ø		2-1/16"	6	0730053
Ø	54.0	2-1/8"	6	0730054
Ø	55.0		6	0730055
Ø		2-3/16"	6	0730056
Ø	57.0	2-1/4"	6	0730057
Ø	58.0	a =/+<"	6	0730058
Ø	59.0 60.0	2-5/16" 2-3/8"	6 8	0730059 0730060
ø	61.0	2-3/0	8	0730061
Ø	62.0	2-7/16"	8	0730062
ø	63.0	- //	8	0730063
Ø	64.0	2-1/2 "	8	0730064
Ø	65.0		8	0730065
Ø	66.0	2-9/16"	8	0730066
Ø	67.0	2-5/8"	8	0730067
Ø	68.0		8	0730068
Ø	69.0	2-11/16" 2-3/4"	8 8	0730069
ø	70.0 71.0	2-3/4	0 10	0730070
Ø	72.0	2-13/16"	10	0730071 0730072
ø	73.0	2-13/10	10	0730073
Ø	74.0	2-15/16"	10	0730074
ø	75.0	51 -	10	0730075
Ø	76.0	3"	10	0730076
Ø	77.0		12	0730077
Ø	78.0	3-1/16"	12	0730078
Ø	79.0	3-1/8"	12	0730079
Ø	80.0	3-3/16"	12	0730080
Ø	81.0	5-3/10	12	0730081

Ø mm	Ø Inches	No. of teeth	ProdNo. mm
Ø 82.0		12	0730082
Ø 83.0	3-1/4"	12	0730083
Ø 84.0	3-5/16"	12	0730084
Ø 85.0		12	0730085
Ø 86.0	3-3/8"	14	0730086
Ø 87.0	3-7/16"	14	0730087
Ø 88.0		14	0730088
Ø 89.0	3-1/2 "	14	0730089
Ø 90.0	3-9/16"	14	0730090
Ø 91.0		14	0730091
Ø 92.0	3-5/8"	14	0730092
Ø 93.0		14	0730093
Ø 94.0	3-11/16"	14	0730094
Ø 95.0	3-3/4"	14	0730095
Ø 96.0		14	0730096
Ø 97.0	3-13/16"	14	0730097
Ø 98.0	3-7/8"	14	0730098
Ø 99.0		14	0730099
Ø 100.0	3-15/16"	14	0730100



Drilling in checker sheet



Drilling in square profiles



Drilling in flat steel



Drilling in pipes

HSS-Spare Drill

with tapered center tip	
from Ø 18.0 - 60.0 Ø 6x50 mm	0602650
from Ø 61.0 - 100.0 Ø 8x50 mm	0602850
(old design)	

MT Arbors





(inc. ejector pin Prod. No. 1950500)

Spare Ejector

For tapered center drill from Ø 18.0 - 100.0 mm Ø 6 mm 0732006 from Ø 61.0 - 100.0 mm Ø 8 mm 0732008

MAAAAAA



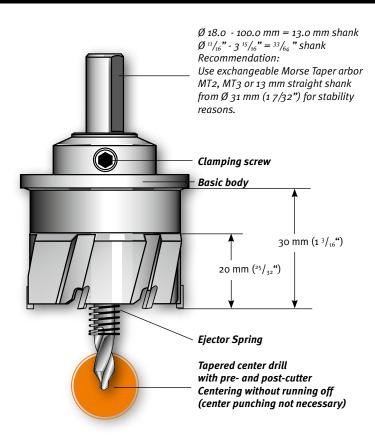


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AUTRA TOTALOUE SAVIS – MBS-PRO

The TCT Multi-Range Hole Saw • Made in Germany by ALFRA





cutting.

MBS-Multirange Hole Saws for universal use. Max. cutting depth 20 mm (²⁵/₃₂")

Suitable for flat materials but also for pipes and curved surfaces. Cutting of overlapping holes is possible. CAD optimized precision tools with high cutting performance and durability.

For use on stationary and portable drilling machines (recommended up to max. Ø 40 mm; 1 9/16")

- Portable drilling Machines: up to 6 mm (15/64") material thickness
- Stationary drilling Machines: up to 20 mm (25/32") material thickness at cutting depths from 6 mm (15/64")we recommend clearing the chips.

MBS hole saws can be resharpened, and it is possible to replace broken out teeth depending on the condition of the hole saw.

Advantages: All Alfra TCT Hole Saws MBS-Pro type are equipped with an ejector spring.

The cut material is self-ejecting. The cut material is self-ejecting.

Another special technical feature:

From Ø 31 mm (17/32"), we use specially hardened tool holders to compensate for the torsional power in case of heavy operation, which avoids early shearing off of the tool holder shank.

In terms of construction not comparable with any other make.

MBS – for almost limitless use

e.g., on Rotabest Magnetic Drilling Machine (with MT2 or MT3 - arbors) and Weldon adaptor Prod.-No. o6oWD on Machines with Weldon Shank.



AUTRA TGT-HOUESAWS - MBS-PRO

The TCT Multi-Range Hole Saw • Made in Germany by ALFRA

Ø mm	Ø Inches	No. of teeth	ProdNo. mm
Ø 18.0	11/16"	6	0760018
Ø 18.6		6	07600186
Ø 19.0	3/4"	6	0760019
Ø 20.0	5.1	6	0760020
Ø 20.4		6	07600204
Ø 21.0	13/16"	6	0760021
Ø 22.0	<i>.</i>	6	0760022
Ø 22.5		6	07600225
Ø 23.0	7/8"	6	0760023
Ø 24.0	15/16"	6	0760024
Ø 25.0		6	0760025
Ø 26.0	1"	6	0760026
Ø 27.0	1-1/16"	6	0760027
Ø 28.0		6	0760028
Ø 28.3		6	07600283
Ø 29.0	1-1/8 "	6	0760029
Ø 30.0	1-3/16"	6	0760030
As from (Ø 31.0 mm	ı (1-7/32'	') we recommend
the use o	of MT arbo	rs	
Ø 31.0		6	0760031
Ø 32.0	1-1/4 "	6	0760032
Ø 33.0		6	0760033
Ø 34.0	1-5/16"	6	0760034
Ø 35.0	1-3/8"	6	0760035
Ø 36.0		6	0760036
Ø 37.0	1-7/16"	6	0760037
Ø 38.0		6	0760038
Ø 39.0	1-1/2 "	6	0760039
Ø 40.0	1-9/16"	6	0760040
Ø 41.0		6	0760041
Ø 42.0	1-5/8"	6	0760042
Ø 43.0	1-11/16"	6	0760043
Ø 44.0		6	0760044
Ø 45.0	1-3/4"	6	0760045
Ø 46.0		6	0760046
Ø 47.0	1-13/16"	6	0760047
Ø 48.0	1-7/8"	6	0760048
Ø 49.0		6	0760049
Ø 50.0	1-15/16"	6	0760050
Ø 51.0	2"	6	0760051
Ø 52.0		6	0760052
Ø 53.0	2-1/16"	6	0760053
Ø 54.0	2-1/8"	6	0760054
Ø 55.0		6	0760055
Ø 56.0	2-3/16"	6	0760056
Ø 57.0	2-1/4"	6	0760057
Ø 58.0		6	0760058
Ø 59.0	2-5/16"	6	0760059
Ø 60.0	2-3/8"	8	0760060
Ø 61.0		8	0760061
Ø 62.0	2-7/16"	8	0760062
Ø 63.0		8	0760063
Ø 64.0	2-1/2"	8	0760064
Ø 65.0		8	0760065
Ø 66.0	2-9/16"	8	0760066
Ø 67.0	2-5/8"	8	0760067
Ø 68.0		8	0760068
Ø 69.0	2-11/16"	8	0760069
Ø 70.0	2-3/4"	8	0760070
Ø 71.0	5/1	10	0760071
Ø 72.0	2-13/16"	10	0760072
Ø 73.0	2-7/8"	10	0760076
Ø 74.0	2-15/16"	10	0760074
0 75 0	5,	10	0760075

Ø 75.0

Ø mm	Ø Inches	No. of teeth	ProdNo. mm
Ø 76.0 m		mmend	using Rotabest AL
	ProdNo.		· •
Ø 76.0	3"	10	0760076
Ø 77.0	1 4 11	12	0760077
	3-1/16"	12	0760078
Ø 79.0	3-1/8"	12	0760079
Ø 80.0	1 61	12	0760080
Ø 81.0	3-3/16"	12	0760081
Ø 82.0		12	0760082
Ø 83.0	3-1/4"	12	0760083
Ø 84.0	3-5/16"	12	0760084
Ø 85.0		12	0760085
Ø 86.0	3-3/8"	14	0760086
Ø 87.0	3-7/16"	14	0760087
Ø 88.0		14	0760088
Ø 89.0	3-1/2 "	14	0760089
Ø 90.0	3-9/16"	14	0760090
Ø 91.0		14	0760091
Ø 92.0	3-5/8"	14	0760092
Ø 93.0		14	0760093
Ø 94.0	3-11/16"	14	0760094
Ø 95.0	3-3/4"	14	0760095
Ø 96.0		14	0760096
Ø 97.0	3-13/16"	14	0760097
Ø 98.0	3-7/8"	14	0760098
Ø 99.0		14	0760099
Ø 100.0	3-15/16"	14	0760100

HSS-Spare Drill

with tapered center tip 🔫

from Ø 18.0 - 60.0 Ø 6x80 mm 0732680 from Ø 61.0 - 100.0 Ø 8x80 mm 0732880 (old design)

MT Arbors



MT-3 (Ø 31.0 - 100.0 mm)

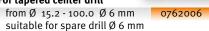
Weldon adapter



Spare Ejector For tapered center drill

0760075

10





Drilling structured sheet metals



Drilling tubes



Drilling flat steels



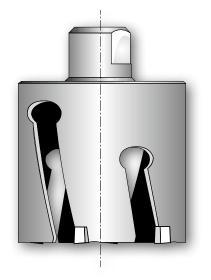
Free-hand drilling up to Ø 30 mm





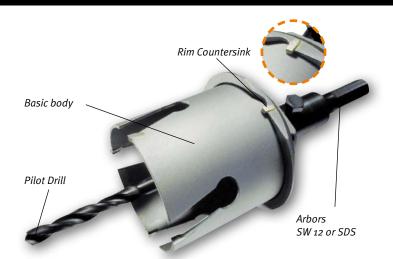
AUTRA TOTALIOUS SAWS – ITRP

The TCT Multi-Range Hole Saw • Made in Germany by ALFRA



Cutting depth 60 mm (2-3/8")

- Specially designed for wood, plain, laminated and coated chip board, plywood, paper-base laminate, PVC, glass fibre reinforced plastic, gas concrete, Ytong stone, plasterboard, hollow gauged brick/stones.
- No blocking due to optimal cutting geometry.
- Simple drill core removal based on new chip space design.
- In the event of a tooth breaking, it can easily be replaced and resharpened.
- Only use when rotating, switch off hammer action.
- Ideal for electricians, plumbers and heating engineers, carpenters and cabinet makers, stair construction and kitchen furniture fitters.

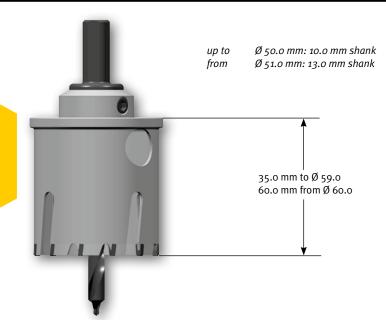


Prod.-No. 0740068060 – FRP Ø 68 mm with tool holder and rim countersink



Perfect assembly of sockets in e.g. wood, gypsum plaster board,...

AUTA TETHOUS SAVE - FRP MULTI-TOOTH

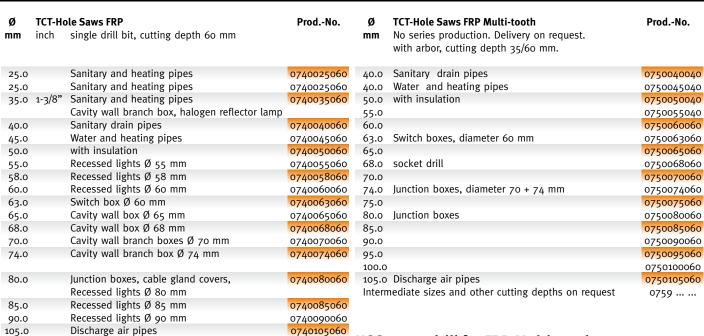


with arbor shank

Cutting depth 35.0/60.0 for sandwich-composite material, wood and chipboard coated with insulation and sheet metal (also stainless), e.g., counters and refrigerators. Please indicate material and thickness!

AUTRA TOTALOUS SAVIS - TRP

The TCT Multi-Range Hole Saw • Made in Germany by ALFRA



HSS spare drill for FRP Multi-tooth Ø 30.0 - 59.0 mm = 8 x 80

Ø 61.0 - 105.0 mm = 8 x 100

Rim countersink for Ø 68 mm

Tool Holder wrench size 12



34-

Tool Holder SDS

-

Spare center drill HSS 7.2 mm

1 Tool Holder wrench size 12

1 HSS drill

0741068000

0742000001

0742000002

0742000003



Prod.-No. 0743000001

FRP Hole Saw Set Electrician Content: 0743000001 1 each of Ø 35/ 68/74 1 Tool Holder wrench size 12 1 HSS drill FRP Hole Saw Set Lighting Content: 0743000002 1 each of Ø 35/60/68/80/85 mm



Prod.-No. 0743000002

ALFRA

0752880

0752800



- Spiral grooved, each step with axial and radial relief grinding according to its diameter
- ► LASER-ETCHED SCALE IN THE CHIP SPACE
- Special drill tip enables centering and drilling even through thin-walled materials
- BURR-FREE DRILLING WITH NO DEFORMATION OF THE SHEET
- ► AVAILABLE IN HSS AND HSS WITH TIAIN COATING

6 - 30



MUITI-STEPDRIUS-IISSDM 03

More precise hole diameter through cylindrical steps. Hole deburring through the next step.

Application area:

The ideal tool for sheet metal forming, for the electrical industry, HVAC or the common engineering or the switchboard industry.

Suitable for all materials such as nonferrous metals, stainless steel sheets, thermoplastic and thermosetting plastics, as well as for steel sheets up to a max. material thickness of 6 mm.

With the Multi-Step Drills, sheet metals can be centered, drilled and subsequently deburred in one work step.

- A break of the drill tip mostly occurs through high feed forces at the start of the drilling operation. Multi-step drills with fixed drill tips are worthless then. A broken center drill in an ALFRA multi-step drill can be easily replaced. This more than compensates for the higher price.
- Each stage is equipped with a radially adjusted relief grinding corresponding to its diameter.
- Each stage is provided with an axial relief grinding and a relief angle on its cutting edge.
- All step diameters are laser marked on the tool.

Benefits of multi-step drills with keyway and 3 cutting edges:

- The keyway allows the drill to make a chipping cut during drilling for better chip removal.
- The special keyway geometry, arranged around the drill, makes for a longer cutting edge compared to the usual straight groove and noticeably easier cutting.
- Spiral cut chip spaces guarantee an absolute running smoothness and a high cutting capacity.

Tip:

The tool life can be considerably prolonged by using of ALFRA Cutting Spray or ALFRA Coolant Stick.

Advantages of TiAlN hard coating:

- Suitable for use on very hard materials (VA).
- Offers optimal tool life with the same use at the highest cutting speeds.
- Very high microhardness HV 0.05 of 3200 so that the blue-black hard coating is more than 20% harder than conventional gold-yellow TIN coating.
- Maximum working temperature: 800°C.

Description	Shank Ø	ProdNo
AMS	10.0	08080
For general machine construction, drills circular		
holes in metals up to 4 mm thick,		
through application with hand		
drills, indispensable on the work-site.		
3 chip spaces, spiral grooved, replaceable center	r drill	
Steps Ø 9 - 12 - 15 - 18 - 21 - 24 - 27 - 30 - 33 - 36	mm	
(Step "4o" is for deburring)		

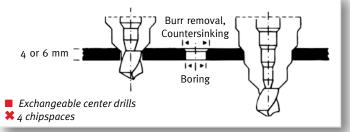
AMS – TiAlN coated	10.0	08081								
3 chip spaces, spiral grooved, replaceable center drill TiAlN coated Steps Ø 9 - 12 - 15 - 18 - 21 - 24 - 27 - 30 - 33 - 36 mm (Step "40" is for deburring)										
AM 1	12.0	08002								
Steps Ø 25 - 28 - 31 - 34 - 37 - 40 - 43 - 46 - 49 - 52 - 55 - 58 mm										

PVD 10.0

For the electrical industry, matched to holes for armoured conduit thread clearance holes, saves considerable time when producing borings for PG

Steps Ø PG 7 - PG 9 - PG 11 - PG 13 - PG 16 - PG 21 - 33 mm - PG 29 - 40 mm









Prod.-No. 08080

Prod.-No. 08081 🗖



08003

Prod.-No. 08002 📕 🗱



Prod.-No. 08003 📕 苯





MUUT-STEPDRIUS-IISSDM 03

More precise hole diameter through cylindrical steps. Hole deburring through the next step.



Prod.-No. 08032 📕 X

Prod.-No. 08007

📕 Replaceable center drill 🛛 🗱 6 With 4 chip spaces

Prod.-No. o8oo8

86



MUIII-STEPDRIUS-IISSDM 03

More precise hole diameter through cylindrical steps. Hole deburring through the next step.

Standard execution with 2 chip spaces, spiral grooved.

- More precise hole diameter through cylindrical steps.
- Immediate deburring through the next step
- Drilling of sheet metals as thin as 4 mm possible.
- Use coolant stick!
- The keyway allows the drill to make a chipping cut during drilling for better chip removal.
- Longer cutting edge compared to the usual straight groove and noticeably easier cutting.
- Laser-etched scale in the chip space to indicate the bore diameter achieved.

Description	Bore range	Shank Ø	Length	ProdNo.
AM-12	4 - 12 mm x 1 mm	6.0	70 mm	08070
AM-20	6 - 20 mm x 2 mm	9.0	77 mm	08071
AM-30	6 - 30 mm x 2 mm	10.0	98 mm	08072
Set in plastic	ase			08073
Contents:				00075
1 of each Type A	M-12/AM-20/AM-30			
High-performa	nce coolant stick			09012



Prod.-No. 08072

Prod.-No. 09012

Standard values for the use of ALFRA Multi-step drills

This drill was developed to bore perfectly round and deburred holes in sheet metal from 4 - 6 mm thick. The transition forms a radius which serves to deburr or bevel the hole at the same time. While conical one-lip bits drill a slightly tapered hole, our ALFRA multi-step drill achieves a cylindrical hole. The tools have axial-radial relief grindings and can be lightly reground on the breast of the cutting tooth.

We recommend the use of pillar drilling machines, however, the small AL-FRA Multi-step drills can be used on adjustable hand drilling machines. Sufficient cooling using ALFRA coolant stick or a bore emulsion is imperative.

Speed chart rpm

Туре		sheet steel S235	stainless steel sheets	non-ferrous metals	plastics (soft)
AM	drill	800	360	1000	1000
	countersink	500 - 180	50 - 70	800 - 400	1000 - 400
AM-1	drill	800	360	1000	1000
	countersink	200 - 100	100 - 50	500 - 200	600 - 250
PVD+PVK+DKI	drill	800	360	1000	1000
PVD-VA + SVB	countersink	400 - 200	200 - 100	800 - 500	1000 - 600



Prod.-No. 08073

PREGISION CONTEMP DIES - ISS DM 03

With laser-etched scale

ALFRA

ALFRA Precision Conical One-Lip Bits are the ideal tools for general sheet metal working. Fields of applications include HVAC, electronic industries, engineering and panel building.

To be used on non-ferrous metals, stainless steels, thermo- and duroplastic plastics, as well as on all common sheet steels up to a material thickness of max. 4 mm. With ALFRA Conical One-Lip Bits, you can center, spot drill and bore up in one work step.

If treated carefully, can be reground many times.

The tool life can considerably be prolonged by using ALFRA Cutting Oil or Coolant Stick.

Packing: separately in plastic box with operation manual.

Size	Range	Shank-Ø	ProdNo.
1	3.0 - 14.0	6.0	09001
2	6.0 - 20.0	8.0	09002
3	16.0 - 30.5	10.0	09003
4	26.0 - 40.0	12.0	09004
5	35.0 - 50.0	12.0	09005
6	46.0 - 60.0	13.0	09006
7 L	4.0 - 30.5	10.0	09007
8*	6.0 - 22.5	8.0	09008
Set 1	Size. 1 + 2 + 3 + Stift		09009

Coolant stick, separately

*Special Antenna-Bit

- Conical one-lip bit with cylindrical end section to drill holes for car antennas.
- Burr-free, no deformation, no countersinking, dimensional accuracy
- Size 6.0 - 22.5 mm.

Precision	Conical (One-Lip	Bit Set
Tin box		-	

Contents: 1 x Size 1 1 x Size 2

1 x Size 3





Prod.-No. 09002



Prod.-No. 09003

Prod.-No. 09004

09011

Prod.-No. 09009

Prod.-No. 09001







Prod.-No. 09007

Prod.-No. 09008*



Prod.-No. 09006

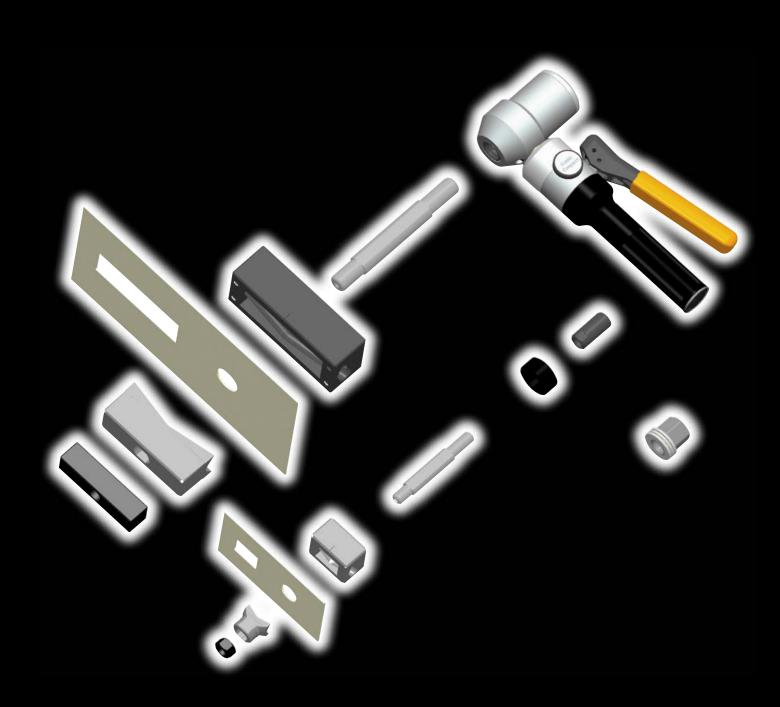


Prod.-No. 09005





TEGINICAL INFORMATION INSTRUCTIONS, ROTATION SPEED TABLES



ALFRA

PUNCIE DIE - TABUEOF MAESANDARAUCTION POSSIBIUMES

		For use	with					
Punch dimension	Wrench	Hand-Hydraulic punch Compact, Compact-Combi, Compact Flex	Battery packed Hydraulic punch Akku Compact	n hydraulic pump with				
	51	TANDARD PUNCH ROUNL	,					
12,7 - 82,0 mm	v	 ✓ 	 ✓ 	 ✓ 				
89,0 - 120,0 mm	-	-	✓ with special screw	 ✓ 				
SPLITT	ER PUNCH ROU	ND TRISTAR/ TRISTAR P	LUS/ TRISTAR PL	US-S				
12,5 - 63,5 mm	V	V	 ✓ 	 ✓ 				
	\$	PUNCHER SQUARE						
12,7 x 12,7 mm - 25,4 x 25,4 mm	¥	 ✓ 	 Image: A second s	 ✓ 				
45,5 x 45,5 mm - 68,0 x 68,0 mm	-	 ✓ 	 Image: A second s	 ✓ 				
92,0 x 92,0 mm	-	-	with special screw					
125,0 X 125,0 mm - 138,0 X 138,0 mm				 ✓ 				
	PUNCHER	SQUARE FOR STAINLES	S STEEL					
46,0 x 46,0 mm - 68,0 x 68,0 mm		 ✓ 	¥	 ✓ 				
92,0 x 92,0 mm	-		✓ with special screw	 ✓ 				
		PUNCHER RECTANGUL	AR					
17,0 x 19,0 mm - 25,0 x 50,0 mm	✓	 ✓ 		 ✓ 				
45,0 x 92,0 mm - 46,0 x 92,0 mm	-		 Image: A second s	 ✓ 				
68,0 x 138,0 mm	PUNCHER R	ECTANGULAR FOR HEAV	Y CONNECTORS	V				
36,0 x 52,0 mm - 46,0 x 86,0 mm		v	~	 ✓ 				
46,0 x 112,0 mm	-		-	 ✓ 				
		De to Punche	R SPECIAL SHAPE	S				
Ø 22,5 mm with 3 mm nose	 ✓ 	V	V	 ✓ 				
Ø 22,5 mm 2-side flattened to 18,5 mm	 ✓ 	✓	 	v				
Ø 22,5 mm 4-side flattened to 20,1 mm BKS-Profile cylinder								
Ø 16,3 mm 4-side flattened to 14,1 mm								
	4	PUNCHER - SUB-MIN-D						
9 polig - 50 polig	V	v	v	V				
	•	•	•	•				

PUNCHER - FOR MANUALAND HMDRAUUG OPERATION

Square, rectangular and special shapes

- 1. Screw draw stud $\mathbf{6}$ with thread fully into the hydraulic cylinder $\mathbf{6}$.
- 2. Die 1 must not be canted when placed on draw stud 3. Use distance bushes **6** if necessary.
- 3. Insert draw stud 69 through pre-drilled hole in the control cabinet door. 4. Set the punch $\boldsymbol{2}$ squarely on the hydraulic draw stud from the rear and tighten the lock nut $\mathbf{0}$.
- 5. Align the puncher $\boldsymbol{2}$ on the cross-hair with the four markings.

Operating the hydraulic pump

- Draw the punch fully through the metal.
- Do not use force.
- Release the pressure on the hydraulic cylinder after the punching operation by opening the valve wheel on the pump (hydraulic cylinder body).
- Disassemble the puncher and remove the waste from the die.

Caution:

- Only operate the puncher until the metal is cut. Avoid the punch acting against the inside of the die.
- Staggered punching (nibbling) is not possible.
- Never use force.

Important!

- Draw stud, cutter and guides should always be oiled or greased; punch and die then move more easily.
- Sharpen the punch in good time, depending on degree of bluntness.
- 1 lock nut
- 👍 die
- forcing nut for manual operation 8 hydraulic cylinder
- 😢 punch 6 distance bush
- e draw stud
- (6) adapter for hydraulic operation

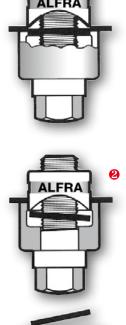
PUNGHER = DID YOU KNOWR

Punchers with three cutting tips as standard

The waste drops easily out of the die, if you turn the punch 2-3 turns further into the die using a spanner after the punching operation.

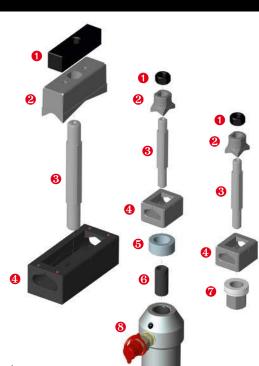
This pushes the waste piece over the edge of the die and so falls freely out of the die if you have predrilled 11 or 21 mm. 🥹







Puncher cutting diagram



ALFRA

When operated with wrench, use forcing nut 7 instead of adapter 6



TET CUMING TOOLS – TECHNICAL TERMS

Clearance Angle

Is the angle between the TCT tooth and the material to be cut. ALFRA TCT Cutters are equipped with serveral clearance angles at a cutting edge.

Cutting Depth

Is the maximum material thickness which might be cut with the particular tool (not to be mistaken with the constructive height of the tool).

Chip Flute

Takes the generated chips and advances this out of the bore.

Chip Forwarding Pitch

Forwards the chips from the TCT tooth to the chip flute.

Chip Surface

On this surface the chip is formed.

Chip Angle Is the angle between tool axis and chip surface.

Tooth Excess Length Is the carbide excess to the basic body.

Tooth Height Difference

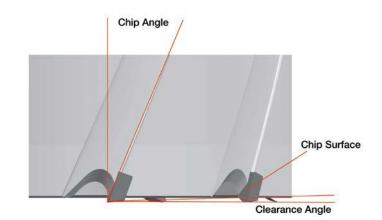
Acts as a chip breaker.

RPM, cutting speed and feed (approximate value) Rotabest[®]-TCT cutter Not suitable for automatic feed

Material	m/min	mm/rpm
Constructional steel 50 kp/m ²	40-60	0.08-0.12
Steel 50-70 kp/m²	30-50	0.08-0.12
Stainless steel	18-45	0.8-0.10
Cast iron	65-95	0.12-0.20
Non-ferrous metals, Aluminium	100-550	0.22-0.45
Exotic alloys	10-30	0.05-0.08

Exactness (approximate value)/input/+ 0.10 mm Output /±0 mm





ISS BI MERAL TIOUE SAWS - NOTES ON USE

To achieve the best results:

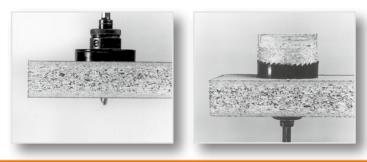
- 1. Use the hole saws at the recommended cutting speed, see guide table on the packaging.
- 2. Do not apply excess pressure. Apply a little more pressure for a harder material and less pressure for a softer material.
- 3. In order to achieve good centring, the centre drill must project approximately 6 mm beyond the teeth. It is recommended that the hole is first predrilled with a twist drill and then the centre drill is used in the adapter as a centring pin.
- Use a good cutting oil when drilling metal. This extends the hole saw's service life and prevents premature blunting of the tooth tips.
- 5. The arbor of the adapter must be firmly clamped with the flattened sides correctly seated in the chuck.
- 6. The hole saw must cut into the workpiece at a right angle. Avoid tilting. Risk of accident.
- If large hole saw diameters are used in hand-held drills, the hand-held drill must be held particularly firmly. A drill stand should be used where possible.
- 8. The adapter must be firmly screwed into the hole saw with all its thread and the driver pins must be firmly seated in the driver holes.
- 9. Secure the driver pins with the rotating ring or lock in the case of a quick-change adapter.
- 10. Wear protective goggles when working with the bi-metal hole saws and keep hands away in case saw runs out. Never attempt to stop with your hands a saw that is running off.
- 11. Lift the saw clear frequently, especially when cutting timber, chipboard and wood substitutes and remove the sawdust and chips. If this is not done, the tooth tips can burn and the hole saw will jam in the cut.
- 12. We recommend the following procedure when drilling timber, chipboard and wood substitutes:

Drill a number of holes immediately inside the cut. This helps carry the chips away and avoids frequent interruptions in cutting to clean the tooth tips.



If the workpiece is especially thick it is also recommended that you cut from both sides, or drill a number of

holes immediately inside the circular cut. This helps carry the chips away and avoids frequent interruptions in cutting to clean the tooth tips.





Enlarging existing holes

Existing holes 32 mm (1-1/4") or more in diameter may be enlarged with a simple trick: Take a 32 mm diameter hole saw and screw this inside the hole saw on the projecting thread of the A2 adapter. The inner hole saw then acts as a kind of guiding hole saw for extending existing holes, see photo.



ΔLFRΔ

What you absolutely must avoid:

- 1. Drilling at too fast or too slow cutting speed. The teeth will glide over the material and become prematurely blunt.
- 2. Avoid bringing the saw teeth abruptly down on the workpiece, the teeth will break off.
- 3. Never cut metallic materials dry. Always use a cutting oil.
- 4. Never bring the saw up to the workpiece on a slant. There is a risk of injury when hand drills are used. The saw can break up or the arbor could be damaged.
- 5. Ensure that the hole saw is running true. Check the chuck as necessary.
- 6. Never screw the adapter's guide pins only partially into the hole saw guide holes. The thread of the hole saw could be torn out.
- Never regrind the hole saw freely by hand. Have hole saws reground by a specialist. Care must be taken to ensure sufficient residual setting and a uniform tooth height.
- 8. If the tool arbor is pushed into the chuck or if the arbor shears off, the advance pressure is too great.
- 9. If the hole saw is unevenly worn on the outside, then the saw is not running true or the material to be sawn was not correctly clamped.
- If the tooth tips are blued, the saw has been used without cutting oil, or at too high a cutting speed.



ISS BHMATAL IOUS SAVIS - STAD GIART

Recommended Speed for various materials (RPM)

Diameter mm	Mild Steel	Cast Iron	Tool steel + stainless steels	Brass	Aluminium	Wood		
14	580	400	300	790	900	3000		
16	550	365	275	730	825	3000		
17	500	330	250	665	750	3000		
<u>,</u> 19	460	300	230	600	690	3000		
20	440	290	220	580	660	3000		
21	425	280	210	560	635	3000		
22	390	260	195	520	585	3000		
24	370	245	185	495	555	3000		
25	350	235	175	470	525	2700		
27	325	215	160	435	480	2700		
29	300	200	150	400	450	2700		
30	285	190	145	380	430	2400		
32	275	190	140	380	410	2400		
	260	175	-	-		2400		
33		165	135	345	390	-		
35	250	165	125 120	330	375 360	2400		
37	240			315	_	2400		
38	230	150	115	300	345	2400		
40	220	145	110	290	330	2100		
41	210	140	105	280	315	2100		
43	205	135	100	270	305	2100		
44	195	130	95	260	295	2100		
46	190	125	95	250	285	2100		
48	180	120	90	240	270	2100		
51	170	115	85	230	255	2000		
52	165	110	80	220	245	2000		
54	160	105	80	210	240	2000		
57	150	100	75	200	225	2000		
59	145	100	75	195	225	2000		
60	140	95	70	190	220	2000		
64	135	90	65	180	205	1800		
65	130	85	65	175	200	1800		
67	130	85	65	170	195	1800		
70	125	80	60	160	185	1800		
73	120	80	60	160	180	1800		
76	115	75	55	150	170	1500		
79	110	70	55	140	165	1500		
83	105	70	50	140	155	1500		
86	100	65	50	130	150	1200		
89	95	65	45	130	145	1200		
92	95	60	45	120	140	1200		
95	90	60	45	120	135	1200		
98	90	60	45	120	135	1200		
102	85	55	40	110	130	1000		
105	80	55	40	110	120	1000		
108	80	55	40	110	120	900		
111	80	50	40	100	120	900		
114	75	50	35	100	105	900		
121	75	50	35	95	95	900		
127	65	45	30	<u> </u>	90	800		
133	60	40	25	86	85	800		
140	60	40	25	85	85	800		
140	55					800		
140	22	35	25	75	75	000		







These speeds are benchmarks. The speed can be higher or lower, this depends on the material type and the cutting behaviour.

Attention: Do not use cutting oil, if you are cutting cast iron. If you are cutting aluminium use paraffin wax or paraffin.

Calculation of the Cutting Speed

n = Speed (1/min)

 v_c = Cutting speed (m/min)

d = Tool diameter (mm)

 $v_{c} = \frac{\pi x d x n}{1000}$

Speed calculation

n = Speed (1/min)

 v_c = Cutting Speed (m/min) d = Tool diameter (mm)

V_c X 1000 n = **d** • π

Worked sample: d = 20 mm $v_c = 50 \text{ m/min}$ n = -

50000 = 795.77 1/min 20 • π

Teal				С	utting	a spe	ed	(m/m	nin)				
Tool													
Ø	-	Stain	less st	eel mat	terial	Mild	steel -	ST ma	terial				
	20	25	30	35	40	45	50	55	60	65	70	75	80
16	398	498	597	697	796	896	995	1095	1194	1294	1393	1493	1592
18	354	442	531	619	708	796	885	973	1062	1150	1238	1327	1415
20	318	398	478	557	637	717	796	876	955	1035	1115	1194	1274
22	290	362	434	507	579	651	724	796	869	941	1013	1086	1158
24	265	332	398	464	531	597	663	730	796	863	929	995	1062
26	245	306	367	429	490	551	612	674	735	796	857	919	980
28	227	284	341	398	455	512	569	626	682	739	796	853	910
30	212	265	318	372	425	478	531	584	637	690	743	796	849
32	199	249	299	348	398	448	498	547	597	647	697	746	796
34	187	234	281	328	375	422	468	515	562	609	656	703	749
36	177	221	265	310	354	398	442	487	531	575	619	663	708
38	168	210	251	293	335	377	419	461	503	545	587	629	670
40	159	199	239	279	318	358	398	438	478	518	557	597	637
42	152	190	227	265	303	341	379	417	455	493	531	569	607
44	145	181	217	253	290	326	362	398	434	470	507	543	579
46	138	173	208	242	277	312	346	381	415	450	485	519	554
48	133	166	199	232	265	299	332	365	398	431	464	498	531
50	127	159	191	223	255	287	318	350	382	414	446	478	510
52	122	153	184	214	245	276	306	337	367	398	429	459	490
54	118	147	177	206	236	265	295	324	354	383	413	442	472
56	114	142	171	199	227	256	284	313	341	370	398	427	455
58	110	137	165	192	220	247	275	302	329	357	384	412	439
60	106	133	159	186	212	239	265	292	318	345	372	398	425
62	103	128	154	180	205	231	257	283	308	334	360	385	411
64	100	124	149	174	199	224	249	274	299	323	348	373	398
66	97	121	145	169	193	217	241	265	290	314	338	362	386
68	94	117	141	164	187	211	234	258	281	304	328	351	375
70	91	114	136	159	182	205	227	250	273	296	318	341	364
72	88	111	133	155	177	199	221	243	265	288	310	332	354
74	86	108	129	151	172	194	215	237	258	280	301	323	344
76	84	105	126	147	168	189	210	230	251	272	293	314	335
78	82	102	122	143	163	184	204	225	245	265	286	306	327
80	80	100	119	139	159	179	199	219	239	259	279	299	318
82	78	97	117	136	155	175	194	214	233	252	272	291	311
84	76	95	114	133	152	171	190	209	227	246	265	284	303
86	74	93	111	130	148	167	185	204	222	241	259	278	296
88	72	90	109	127	145	163	181	199	217	235	253	271	290
90	71	88	106	124	142	159	177	195	212	230	248	265	283
92	69	87	104	121	138	156	173	190	208	225	242	260	277
94	68	85	102	119	136	152	169	186	203	220	237	254	271
96	66	83	100	116	133	149	166	182	199	216	232	249	265



ALFRA





FRP Hole Saws

65

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98

100

Ømm	Timber Chipboard	Plastics	Masonry	Wall tiles*
25/30/35	1000	800	800	500
40/45/50	800	600	700	400
58 to 74	600	400	600	400
80/105	400	300	300	300

81

80

* Drilling in tiles only up to a scratch hardness of 6, mark centre, set the centre drill and drill through the glaze with at a low speed, allow the saw teeth to penetrate the glazing uniform-ly, running as smoothly and level as possible, so that the edge of the hole is made without chipping. Continue drilling at a normal drilling speed. Tiles with a scratch hardness greater than 6 may only be cut with diamond or carbide hole saws.

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Notes on use

211

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Use rotation only. Switch off impact or hammer drill.

244

223 239 255

260

- Impact and shock on the sharp, ground carbide cutters can lead to small carbide splinters and thus to a severe loss of performance.Do not tilt the hole saw in the hole.

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• Remove the drill core after each operation. Remove the sawdust when drilling timber and timber products.

Notes on use

For multipurpose hole saw with rim countersink • The rim countersink is placed between hole saw and adapter and the carbide cutter is used to make a countersink in timber and timber substitutes. This makes it possible to fit sockets flush.

Important notes on use

- The hole saw with rim countersink may not be stopped before it is removed.
 Advance with care, to prevent the cut edges tearing.

ALFRA-Multi-step drills

ALFRA

These drills were especially made to drill perfectly round and simultaneously deburred holes in sheet metals of 4 - 6 mm. The radius transition simultaneously deburrs or bezels the holes. While conical one-lip bits drill slightly conical holes, cylindrical holes can be drilled with ALFRA Multi-step drills. The tools are axial-radially relief ground and can be resharpened at the breast of the cutting tooth.

We recommend the use of pillar drilling machines, however, the small ALFRA Multi-step drills can be used on adjustable hand drilling machines. Imperatively use sufficient cooling **(ALFRA coolant stick or bore emulsion)?**

ALFRA HSS DM 05 precision Multistep Drill

Take notice of the cuttig speed Grease the cutting lips in case of application

The holes are deburred on both sides by the multistep drills. The multistep drill drills holes in thin materials, enlarges existing holes, makes inclined holes, drills pipes, makes holes penetrating each other. Suitable for any hand drill. For steel – PVC – polystrol – polyester – Plexiglas – card – plywood and similar materials. Can be reground many times, if treated carefully.

Material	Mild steel	Mild steel	Alloy steel	Cast iron	Cast iron	Stainless steel	CuZn alloy brittle	CuZn alloy tough	AL alloy	Thermo- plastic	Duro- plastic	Wood
	< 700	> 700	< 1000	< 250	> 250							
	N/mm ²				< 11% Si							
Material gauge	5.0 mm	3.0 mm	5.0 mm	5.0 mm	5.0 mm	5.0 mm	5.0 mm	25.0 mm				
Lubricant	Drilling paste	Drilling paste	Drilling paste	Air	Air	Drilling paste	Air	Air	Drilling paste	H₂O	Air	Air
Vc = m/min	25	20 - 25	20	15	10	5	60	35	30	20	15	> 40
Ømm	rpm	rpm	rpm	rpm	rpm	rpm	rpm	rpm	rpm	rpm	rpm	rpm
4.0 - 12.0	1900 - 600	1700 - 580	1550 - 520	1190 - 400	800 - 250	400 - 130	4700 - 1550	2750 - 920	2350 - 790	1550 - 520	1190 - 400	3000 - 1000
4.0 - 20.0	1900 - 400	1700 - 350	1550 - 300	1190 - 240	800 - 160	400 - 80	4700 - 950	2750 - 550	2350 - 470	1550 - 300	1190 - 240	3000 - 650
12.0 - 20.0	600 - 400	600 - 350	520 - 300	400 - 240	250 - 160	130 - 80	1550 - 950	920 - 550	790 - 470	520 - 300	400 - 240	1000 - 650
4.0 - 24.0	1900 - 300	1700 - 280	1550 - 250	1190 - 200	800 - 130	400 - 65	4700 - 790	2750 - 460	2350 - 400	1550 - 250	1190 - 200	3000 - 550
6.0 - 30.0	1300 - 250	1200 - 230	1000 - 200	780 - 150	530 - 100	250 - 50	3150 - 630	1850 - 370	1590 - 310	1000 - 200	780 - 150	2100 - 420
20.0 - 30.0	400 - 250	350 - 230	300 - 200	230 - 150	160 - 100	80 - 50	950 - 630	550 - 370	470 - 310	300 - 200	230 - 150	650 - 420
6.0 - 36.0	1300 - 220	1200 - 200	1000 - 170	780 - 130	530 - 90	250 - 45	3150 - 530	1850 - 300	1590 - 260	1000 - 170	780 - 130	2100 - 350
30.0 - 40.0	250 - 200	230 - 180	200 - 150	150 - 120	100 - 80	50 - 40	630 - 470	370 - 280	310 - 240	200 - 150	150 - 120	420 - 310
40.0 - 50.0	200 - 160	180 - 140	150 - 125	120 - 90	80 - 65	40 - 30	470 - 380	280 - 220	240 - 190	150 - 125	120 - 90	310 - 250
50.0 - 60.0	160 - 130	140 - 110	125 - 100	90 - 80	65 - 50	30 - 25	380 - 310	220 - 185	190 - 150	125 - 100	90 - 80	250 - 210

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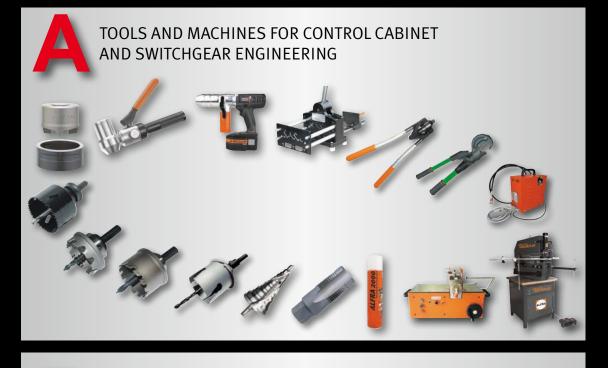
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