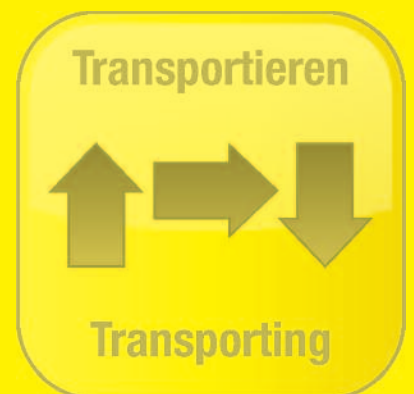
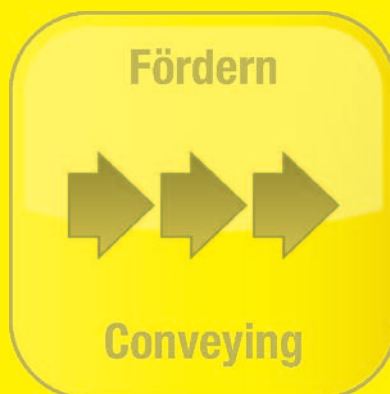
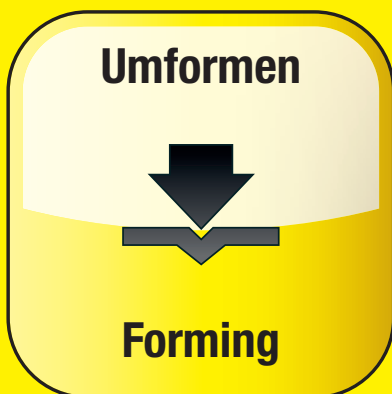
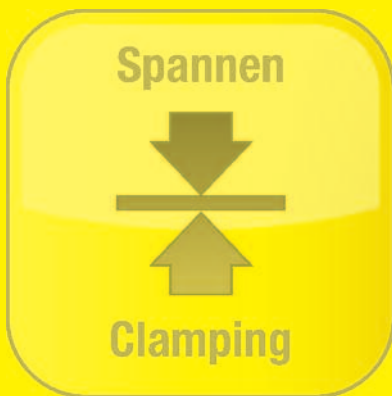


Hole and punching units





Hole punching and punching units

Forming technology is a business area of the TÜNKERS Group who operates in the field of industrial robots and offers the nine automation modules - clamping, positioning, gripping, forming, welding, dispensing, rotating, conveying and transporting.

By forming we mean punching, bending, shaping and joining metal sheets or plastic parts that are used, inter alia, in car body manufacturing in the automotive industry.

We are focussed on specialized installations that are individually designed for the respective application.

By this catalogue and in addition to this special programme, we offer you a product range of standard products with pre-assembled C-frames, drives and application tools. In the best sense this complete modular design system enables you to implement your own solution for your particular field of application very rapidly and – by using complementary components – to re-define a new application tomorrow.

It remains to mention that these modules are available ex works and therefore are at your disposal even at short notice.

Mr. André Michels will answer any questions you may have under tel.: +49 2102 4517-508 or Andre.Michels@tuenkers.de.

We will be pleased to answer your request

André Tünkers

Josef-Gerhard Tünkers

Olaf Tünkers

Punching unit, hole Ø 2-7 mm



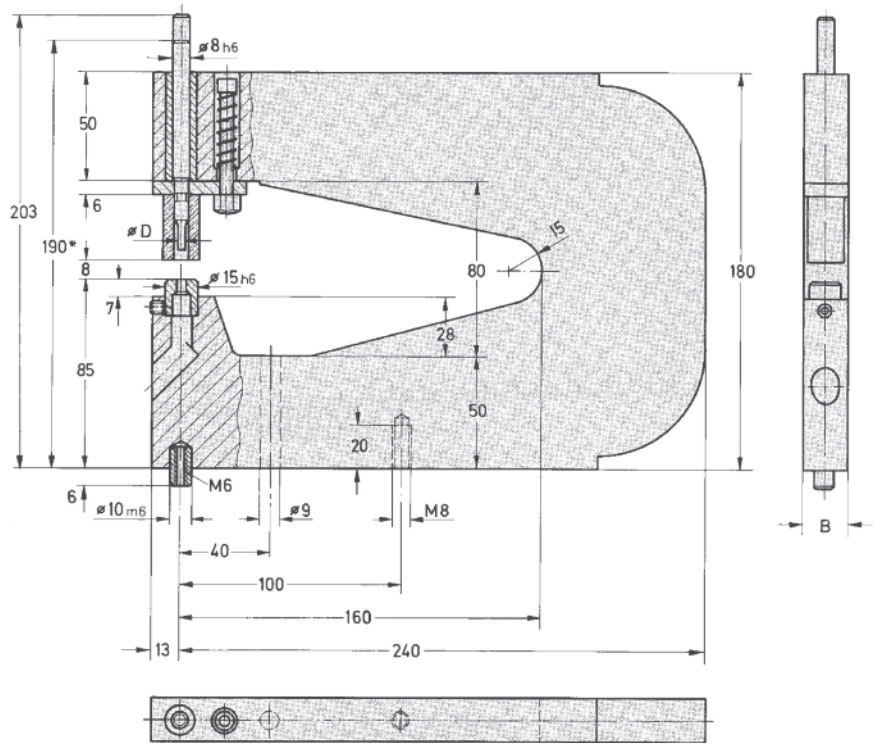
Only round cut

Hole diameter with material thickness 3 2-7 mm¹⁾

Hole diameter with material thickness 5, max. 5 mm¹⁾

Material thickness for steel St 60 0,3-5 mm

¹⁾Hole Ø 6 to 7 mm only in material thickness up to 3 mm.



* Lower edge of punch and upper edge of die are flush

Punching tools (punch and die) have to be ordered separately. See table below.

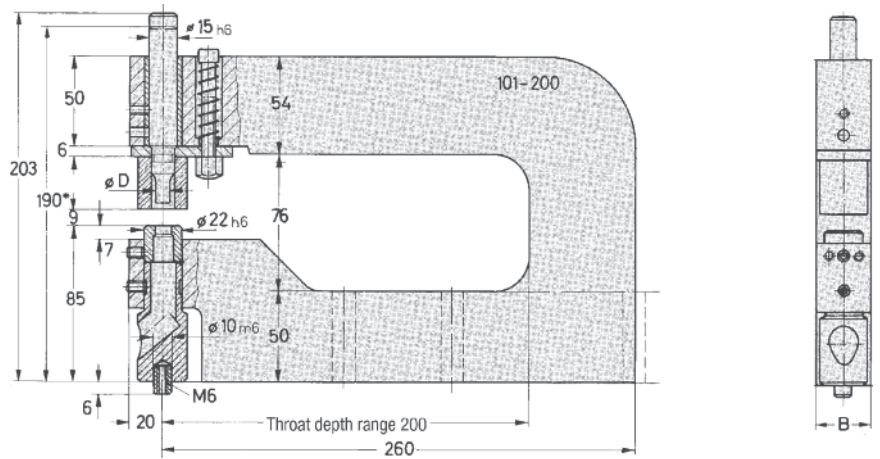
FORMING

Punching unit without punching tools					Punching tools have to be ordered separately		
Order No.	Throat depth range	Hole Ø D	Width B	Weight ~ (kg)	Punch kit Order No.	Round hole Punch Order No.	Die Order No.
100-60	160	2-7	20	5,2	500-Ø-BL-ST	300-Ø	400-Ø-BL-ST

Insert in Order No.: Ø = hole Ø, BL = Material thickness, ST = material and strength. See also **punching tools**. Subject to technical modifications.



Punching unit, hole Ø 2-13 mm

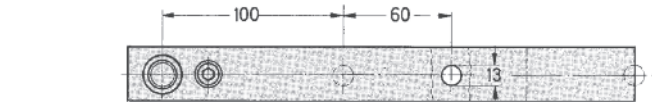


Round and shaped cuts



- Hole diameter with material thickness 3 2-13 mm¹⁾
- Hole diameter with material thickness 5, max. 11 mm¹⁾
- Material thickness for steel St 60 0,3-5 mm

¹⁾hole Ø 12 to 13 mm only in material thickness up to 3 mm.



* Lower edge of punch and upper edge of die are flush

It is possible to punch holes with Ø 2–7 mm by using reduction bushes and reduction sockets, which enable the use of the punch and die from the next smaller size of punching units.

Punching tools (punch and die) have to be ordered separately. See table below.

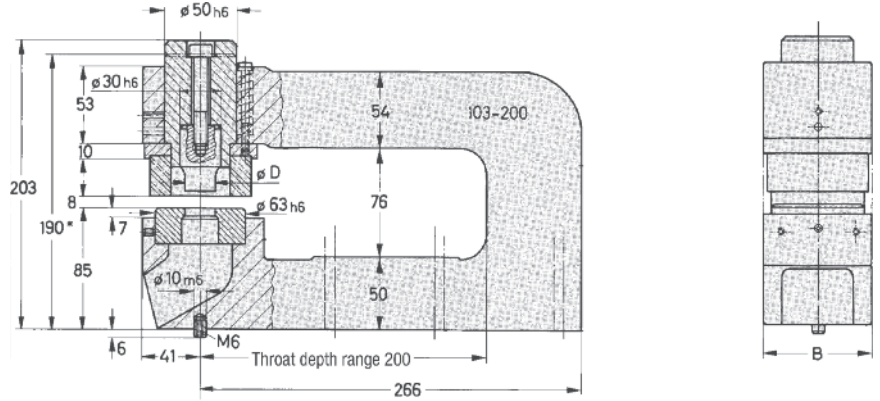
Accessories See pages accessories.

FORMING

Punching unit without punching tools					Punching tools have to be ordered separately			
Order No.	Throat depth range	Hole Ø D	Width B	Weight ~ (kg)	Punch kit Order No.	Round hole Punch Order No.	Die Order No.	Shaped punch Punch kit Order No.
101-200 F	200	2-13	30	7,8	500-Ø-BL-ST	301-Ø	401-Ø-BL-ST	501-Formhole-BL-ST

Insert in Order No.: Ø = hole Ø, BL = Material thickness, ST = material and strength. See also **punching tools**. Subject to technical modifications.

Punching unit, hole Ø 25-40 mm

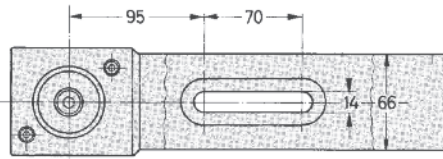


Round and shaped cuts



Hole diameter with material thickness 3 25-40 mm¹⁾
 Material thickness for steel St 60 0,3-5 mm

¹⁾Punching tools for holes with Ø 20-25 mm are available on request in special sizes



* Lower edge of punch and upper edge of die are flush

Punching tools (punch and die) have to be ordered separately. See table below.

Accessories See pages accessories.

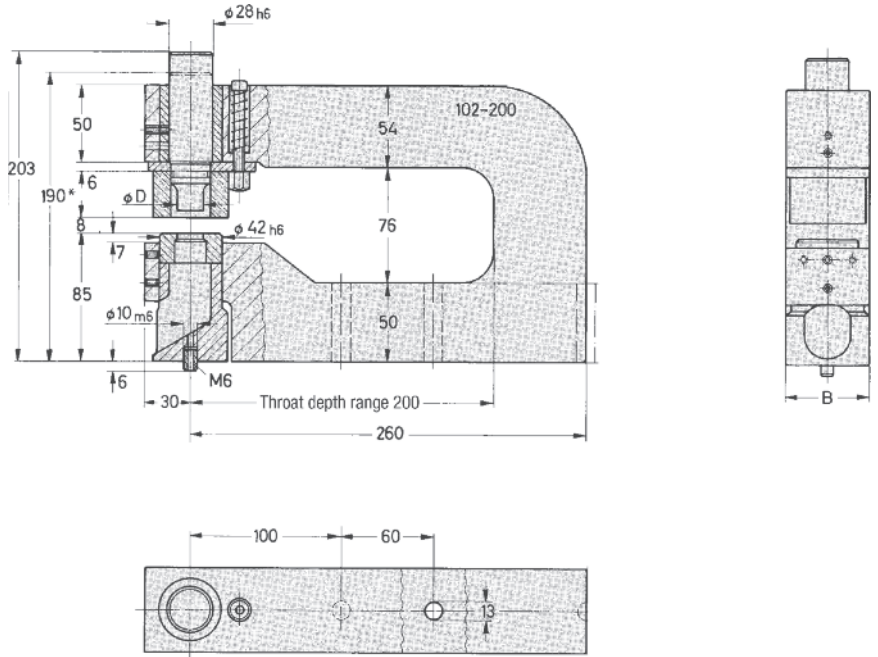
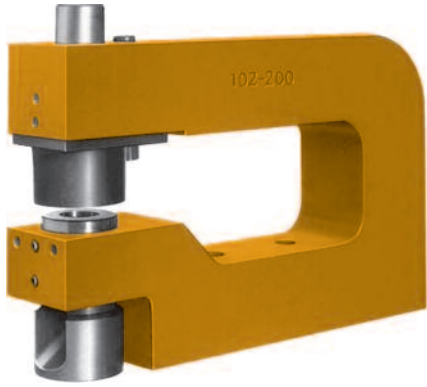
FORMING

Punching unit without punching tools					Punching tools have to be ordered separately				
Order No.	Throat depth range	Hole Ø D	Width B	Weight ~ (kg)	Punch kit Order No.	Round hole Punch Order No.	Die Order No.	Shaped punch Punch kit Order No.	
101-200 F	200	25-40	75	14	503-Ø-BL-ST	303-Ø	403-Ø-BL-ST	503-Formhole-BL-ST	

Insert in Order No.: Ø = hole Ø, BL = Material thickness, ST = material and strength. See also punching tools. Subject to technical modifications.



Punching unit, hole Ø 8-25 mm



Round and shaped cuts



Hole diameter with material thickness 3 8-25 mm¹⁾
 Material thickness for steel St 60 0,3-5 mm

¹⁾ It is possible to punch holes with Ø 2-8 mm by ordering a reduction bush and reduction socket

* Lower edge of punch and upper edge of die are flush

Punching tools (punch and die) have to be ordered separately. See table below.

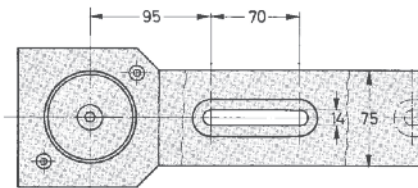
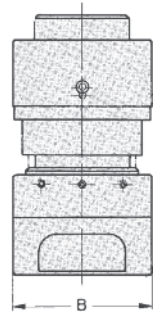
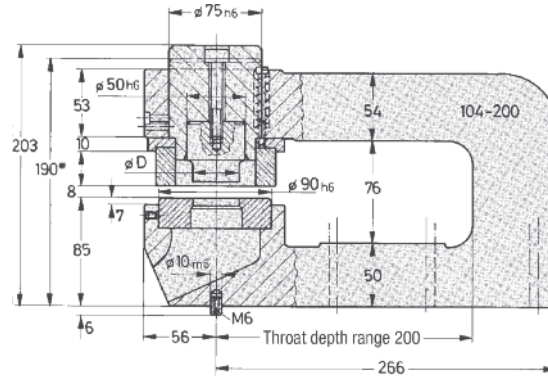
Accessories See pages accessories.

FORMING

Punching unit without punching tools					Punching tools have to be ordered separately			
Order No.	Throat depth range	Hole Ø D	Width B	Weight ~ (kg)	Punch kit Order No.	Round hole Punch Order No.	Die Order No.	Shaped punch Punch kit Order No.
102-200 F	200	8-25	55	15	502-Ø-BL-ST	302-Ø	402-Ø-BL-ST	502-Formhole-BL-ST

Insert in Order No.: Ø = hole Ø, BL = Material thickness, ST = material and strength. See also **punching tools**.
 Subject to technical modifications.

Punching unit, hole Ø 40-63 mm



Round and shaped cuts



Hole diameter 40-63 mm

Material thickness

for steel St 60 0,3-5 mm

Punching tools

(punch and die) have to be ordered separately.
See table below.

Accessories

See pages accessories.

* Lower edge of punch and upper edge of die are flush

FORMING

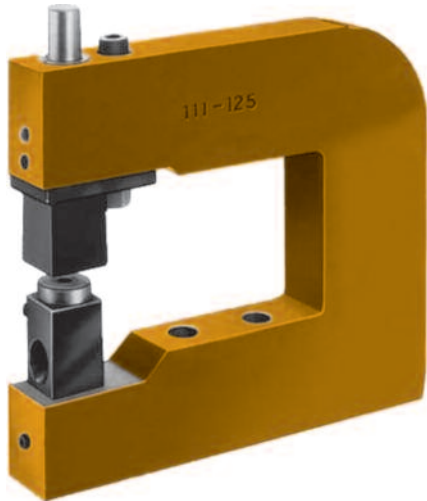
Punching unit without punching tools					Punching tools have to be ordered separately				
Order No.	Throat depth range	Hole Ø D	Width B	Weight ~ (kg)	Punch kit Order No.	Round hole Punch Order No.	Die Order No.	Shaped punch Punch kit Order No.	
104-200 F	200	40-63	108	20	504-Ø-BL-ST	304-Ø	404-Ø-BL-ST	504-Formhole-BL-ST	

Insert in Order No.: Ø = hole Ø, BL = Material thickness, ST = material and strength. See also **punching tools**.

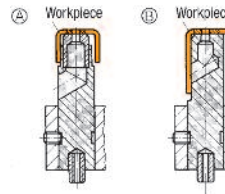
Subject to technical modifications.



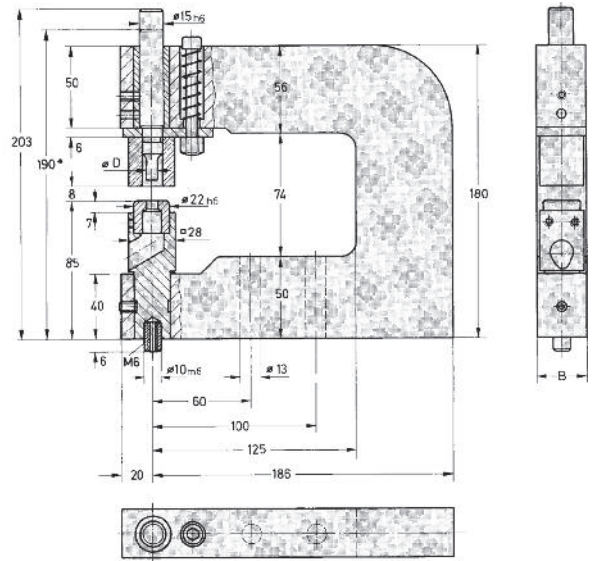
Punching unit, hole Ø 2-13 mm



Examples for the two versions



- Ⓐ Special die block with small special die, adapted to the U-profile
- Ⓑ Block die, adapted to the L-profile



Round and shaped cuts



Hole diameter with material thickness 3 2-13 mm¹⁾
 Hole diameter with material thickness 5, max. 11 mm
 Material thickness for steel St 60 0,3-5 mm

* Lower edge of punch and upper edge of die are flush

¹⁾Hole Ø 12 to 13 mm only in material thickness up to 3 mm.

Punching units of series 111 are particularly suitable for punching small profiles. For special applications, either a special die block with a small special die (see illustration) can be used or a one-piece block die (see illustration). In both cases, the punching of very small profiled parts is possible after removing the standard die block.

Punching tools (punch and die) have to be ordered separately. See table below.

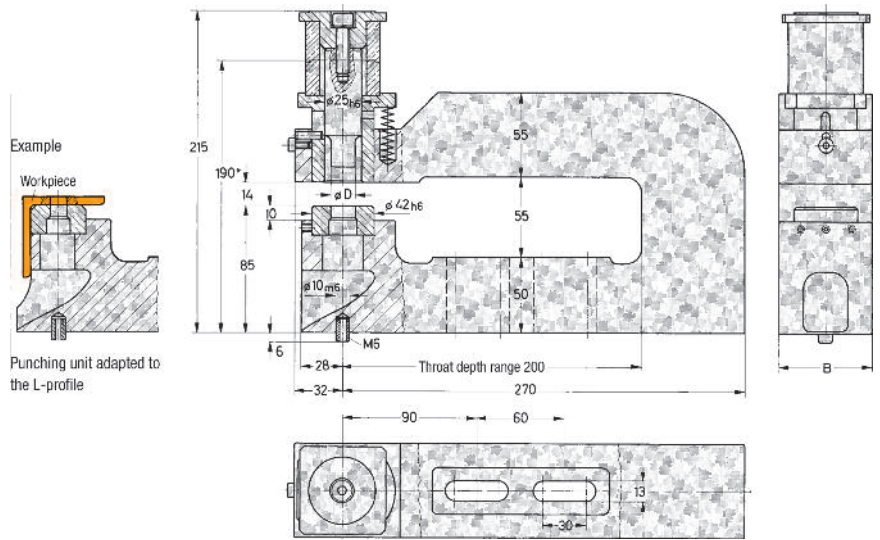
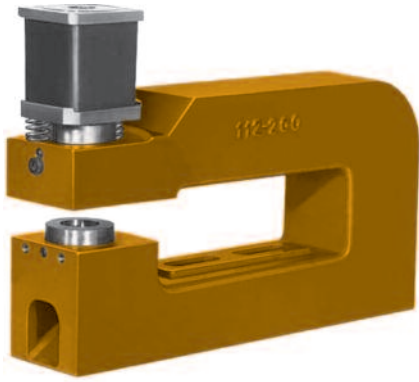
Accessories See pages accessories.

Punching unit without punching tools					Punching tools have to be ordered separately			
Order No.	Throat depth range	Hole Ø D	Width B	Weight ~ (kg)	Punch kit Order No.	Round hole Punch Order No.	Die Order No.	Shaped punch Punch kit Order No.
111-125 F	125	2-13	30	6	501-Ø-BL-ST	301-Ø	401-Ø-BL-ST	501-Formhole-BL-ST

Insert in Order No.: Ø = hole Ø, BL = Material thickness, ST = material and strength. See also **punching tools**.

Subject to technical modifications.

Punching unit, hole \varnothing 8-22 mm



Round and shaped cuts



Hole diameter 8-22 mm

Material thickness for steel St 60 2-10 mm

With small modifications these punching units are suitable for punching L-, U-, or Z-profiles, see application example.

Punching tools (punch and die) have to be ordered separately. See table below.

Accessories See pages accessories.

* Lower edge of punch and upper edge of die are flush

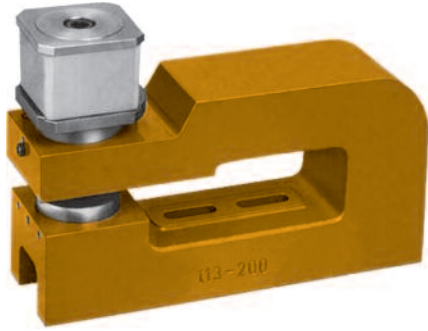
FORMING

Punching unit without punching tools					Punching tools have to be ordered separately			
Order No.	Throat depth range	Hole \varnothing D	Width B	Weight ~ (kg)	Punch kit Order No.	Round hole Punch Order No.	Die Order No.	Shaped punch Punch kit Order No.
112-200 F	200	8-22	63	16	512- \varnothing -BL-ST	312- \varnothing	402- \varnothing -BL-ST	512-Formhole-BL-ST

Insert in Order No.: \varnothing = hole \varnothing , **BL** = Material thickness, **ST** = material and strength. See also **punching tools**. Subject to technical modifications.



Punching unit, hole Ø 22-38 mm



Round and shaped cuts



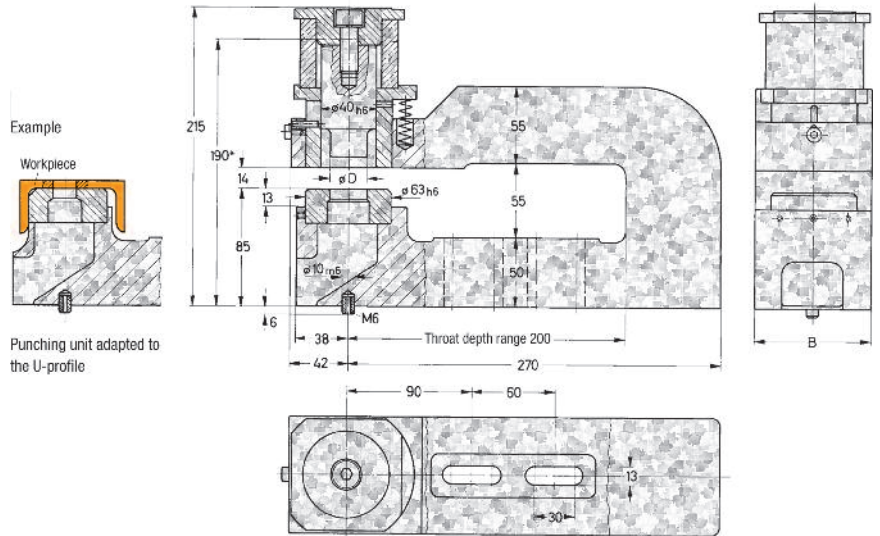
Hole diameter 22-38 mm

Material thickness for steel St 60 2-10 mm

With small modifications these punching units are suitable for punching L-, U-, or Z-profiles, see application example.

Punching tools (punch and die) have to be ordered separately. See table below.

Accessories See pages accessories.



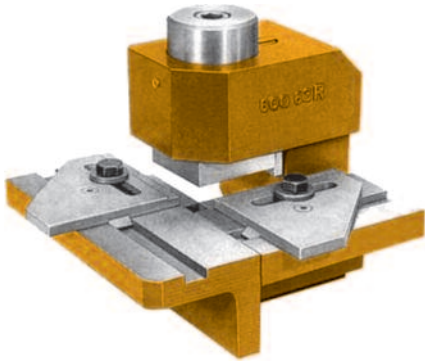
* Lower edge of punch and upper edge of die are flush

FORMING

Punching unit without punching tools					Punching tools have to be ordered separately				
Order No.	Throat depth range	Hole Ø D	Width B	Weight ~ (kg)	Punch kit Order No.	Round hole Punch Order No.	Die Order No.	Shaped punch Punch kit Order No.	
113-200 F	200	22-38	85	21	513-Ø-BL-ST	313-Ø	403-Ø-BL-ST	513-Formhole-BL-ST	

Insert in Order No.: Ø = hole Ø, BL = Material thickness, ST = material and strength. See also **punching tools**. Subject to technical modifications.

90° notch units, notch size 63x63 mm



600-063 R with gauging table 800-063 S

Cutting angle 90°
 Max. notch size 63x63 mm
 Material thickness
 for steel St 60 0,3-8 mm

The **notch units**, adjusted to a die clearance of 0.1 mm, are pre-set in the factory for cutting material with a thickness of 0.3–3 mm. With the metal compensation sheets (0.2 mm) included in the delivery, the die clearance can be set to 0.2 or 0.3 mm for greater material thickness.

With the adjustable **gauging table** the notch size can be adjusted continuously in two directions from 0–63 mm. The gauging table has to be ordered separately.

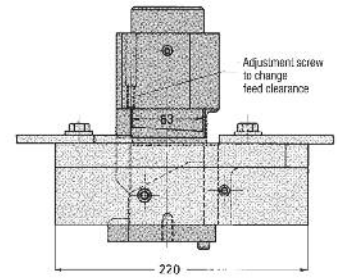
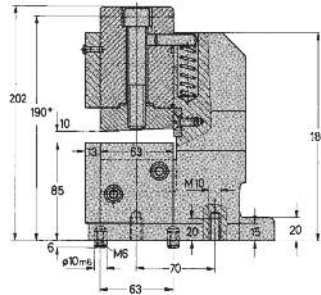
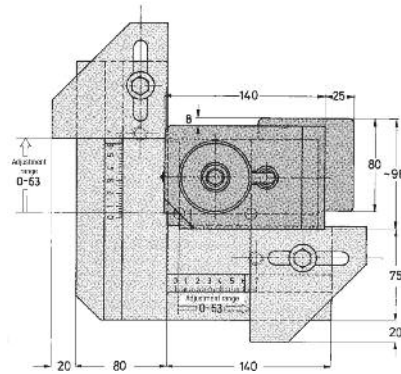
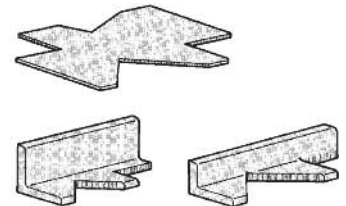


Figure shows 600-063 R with 800-063 S






Notch examples



* Notch unit closed, upper blade inserted to full depth

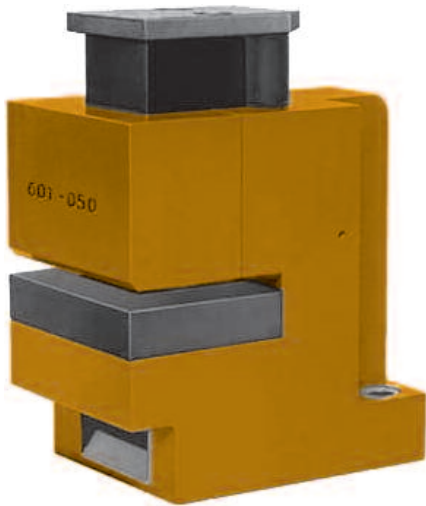
FORMING

90° notch units without gauging table with cutting tools		Gauging table (adjustable) has to be ordered separately		
Version		Weight	Appropriate for notch units	Weight
 Left hand	 Right hand		 600-063 L 600-063 R	
Order No.	Order No.	~ (kg)	Order No.	~ (kg)
600-063 L	600-063 R	15	800-063 S	6,5

Subject to technical modifications.



Rectangle notch units 50x50 and 100x75 mm



601-050

Notch shape rectangle
 Notch size
 version 601-050 50x50 mm
 version 601-100 100x75 mm
 Material thickness
 for steel St 60 0,3-3 mm

The various possibilities for using these rectangle notch units are illustrated below.
 The required die clearance is set in the factory in accordance with the material thickness indicated in the order.

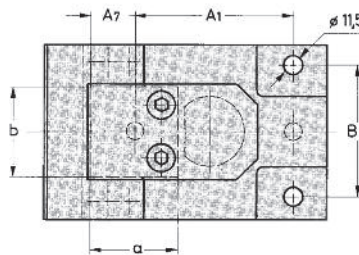
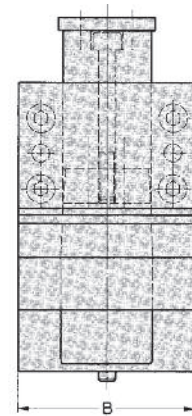
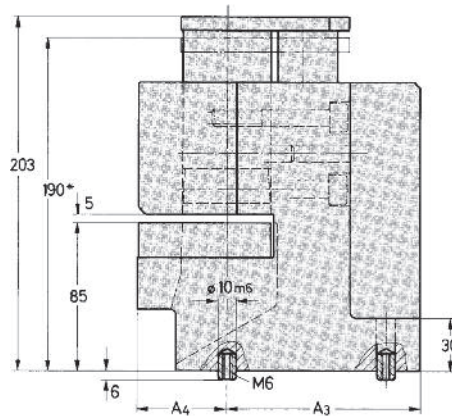
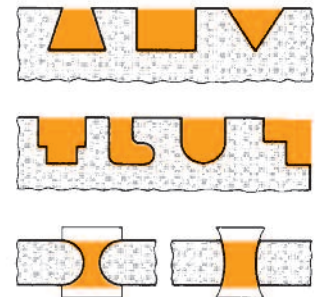


Figure shows 601-050

Possible notch and separation shapes available

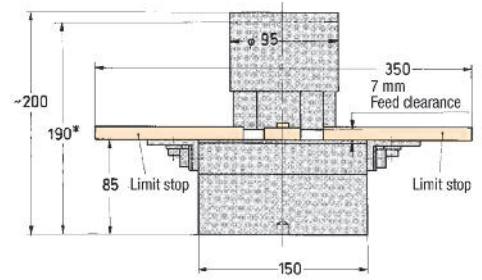
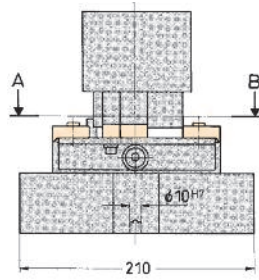
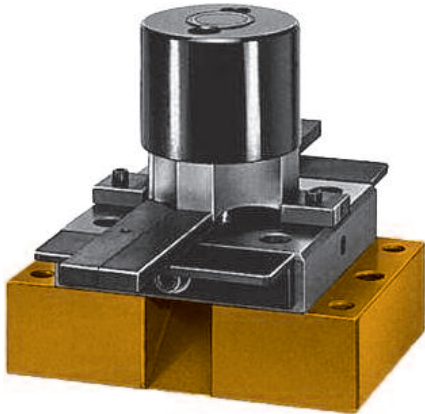


* Notch unit closed, shaped punch inserted

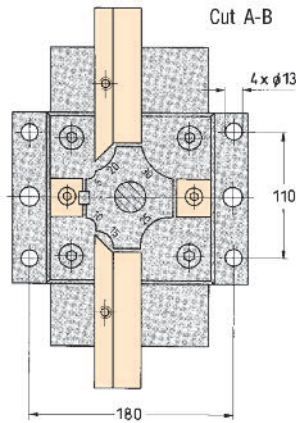
Rectangle notch units with cutting tools	Notch size	a	b	A ₁	A ₃	A ₄	A ₇	B	B ₂	Weight ~ (kg)
Order No.	Width x depth									
601-050	50 x 50	50	50	90	110	50	25	100	75	16
601-100	100 x 75	75	100	100	120	75	37,5	150	100	27

Subject to technical modifications.

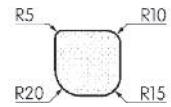
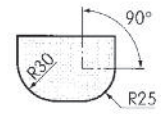
Radius cut unit, R 5-30 mm



= adjustable limit stops



Examples



Possible radii

R 5, 10, 15, 20, 25, 30 mm

Cutting angle α 90°

Material thickness for steel St 37, max. 5 mm

In addition to the pneumatic and hydraulic radius cut units, pressoperated radius cut units are introduced on this page.

By adjusting the limit stops the radius tool unit enables the production of six different 90° radii with only one punching tool.

The graduation of the radii is divided into steps of 5 mm from R 5 mm up to R 30 mm.

Other radii are available on request.

* Radius cut unit closed, upper punch completely inserted

Radius cut unit with cutting tools		
Order No.	Possible radii R	Weight ~ (kg)
606-30	5,10,15,20,25,30	22

Note – Please state preferred material quality and thickness when ordering
Subject to technical modifications.

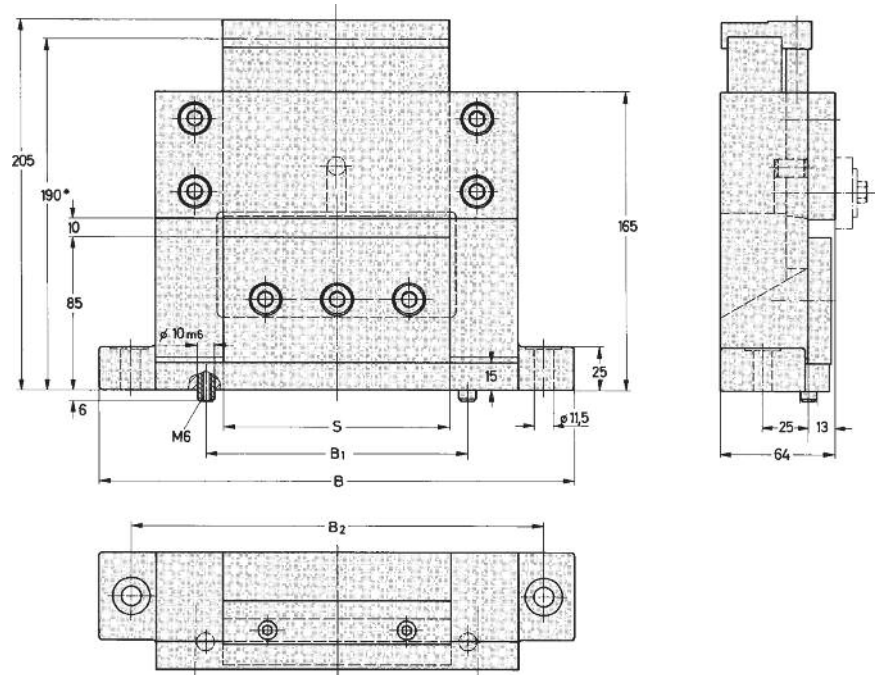
Cut-off units, cutting width 125 and 250 mm



610-125-N

Cutting width, max.
 version 610-125-N 125 mm
 version 610-250-N 250 mm
 Material thickness
 for steel St 60 0,3-8 mm

The **cut-off units**, adjusted to a die clearance of 0.1 mm, are pre-set in the factory for cutting material with a thickness of 0.3-3 mm. With the metal compensation sheets (0.2 mm) included in the delivery, the die clearance can be set to 0.2 or 0.3mm for greater material thickness.



* Cut-off unit closed, upper blade inserted to full depth

FORMING

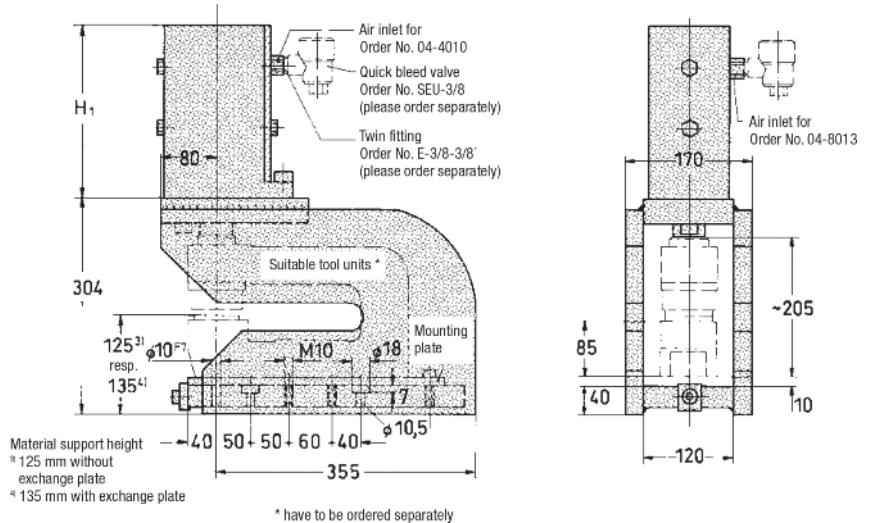
Cut-off units with cutting tools and retainer	Cutting width	Total width	B ₁	B ₂	Weight ~ (kg)
Order No.	S	B			
610-125-N	125	266	150	230	15
610-250-N	250	412	250	380	26

Abschneideeinheiten with größeren Cutting widthn (z.B. 350, 400, 500 mm) on request.
 Subject to technical modifications.

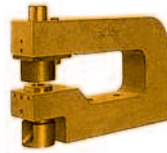


Cylinder force 80 kN

624-2080



Suitable tool units²⁾



Punching units
100 bis 104



Notch units
600-063 L/R
601-050

+

+



Exchange plate has to be ordered separately

Example of a pneumatic table press with the punching unit inserted, together with an exchange plate



These pneumatic table presses have been designed for use with a press-operated punching, notch or cut-off unit.

One advantage of these table presses is their mobility, i.e. they can be used at any location. By using additional exchange plates, it is possible to mount the tool units outside of the press.

As a result, the tool units can be inserted or removed quickly and easily.

The material support height is 135 mm with exchange plate, 125 mm without exchange plate. The cutting force required determines the usage with for the table press, see the cutting force chart. The cutting force, which results from the hole diameter, the material thickness and the material strength, may not exceed the maximum cylinder force.

²⁾Further combinations of tool units with pneumatic table presses are available on request.

Pneumatic table presses							Exchange plate has to be ordered separately for			
Pneumatic	Max. force		Cylinder type	Flange type	H ₁	Weight	Punching units	Notch units	Cut-off units	Weight
Order No.	with air supply pressure of 8 bar (kN)	with oil supply pressure of 350 bar (kN)	Order No.	Order No.	~	(kg)	Order No.	Order No.	Order No.	(kg)
624-2040	40	-	04-4010	-	234	76	816-120-350L	816-120-350K	816-120-350A	3
624-2080	80	-	04-8013	-	405	94				

Subject to technical modifications.



Pneumatic punching units, single-action

Driven by pneumatic power cylinder, single-action

Round and shaped cuts



Hole diameter

- for series 141 2-13 mm
- for series 142 8-25 mm
- for series 143 25-40 mm

Only round cut ● Shaped cut on request
for series 144 40-63 mm

Material thickness

- with steel 0,3-3 mm*
- with aluminium and plastics 0,3-5 mm*

*The cylinder force has to exceed the required cutting force.

Pneumatic punching units can be used independently from a press, as they are driven by the powerful pneumatic power cylinder and only need compressed air as a power source. The pneumatic power cylinders are single-action; for optimum fast reversal, they additionally require a 3/2 way valve, as well as a quick bleed valve; see also the illustrated connection examples.

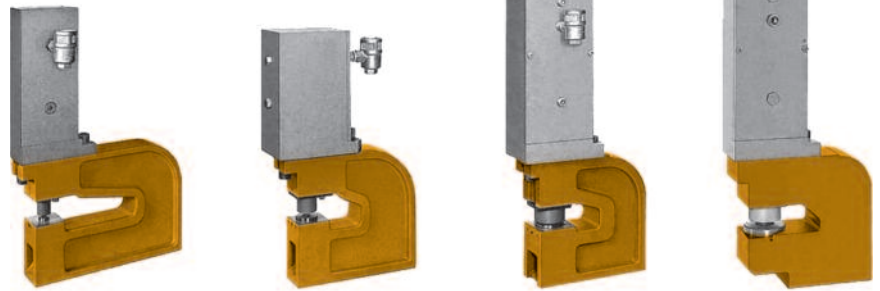
The material support height is 125 mm.

The punching units should be selected according to the punch diameter, material thickness, material strength and the resulting cutting force required.

The different cylinder sizes are interchangeable, as they have the same mounting dimensions. If the cutting force is insufficient the next more powerful cylinder can be used. Double-action hydraulic cylinders, including the mounting flange, can be retrofitted.

The best application for pneumatic punching units is punch work with thin metal sheets up to 3 mm thickness because of their progressive power characteristic feature. With an air supply pressure of maximum 8 bar the cylinder force achieves capacities of 12, 20, 40 or 80 kN depending on the cylinder type.

Subject to technical modifications.

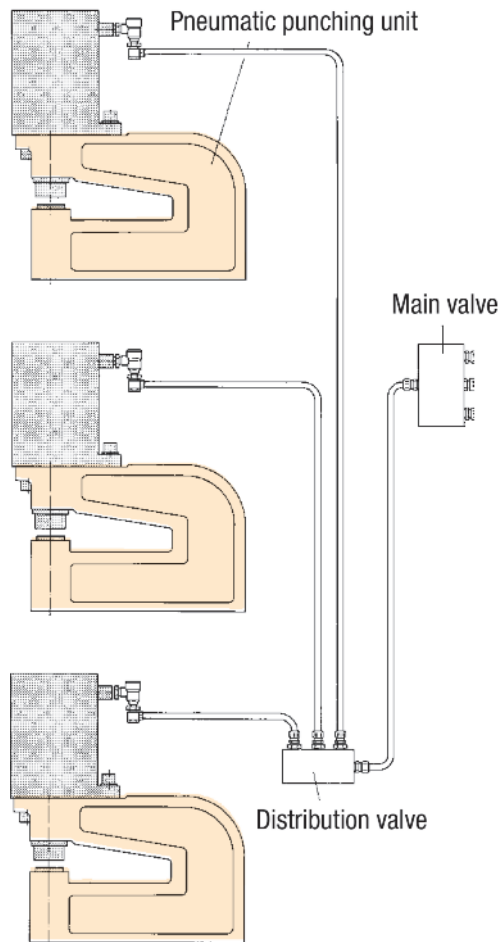


141-2020
Cylinder force
20 kN
Throat depth
range A =
200 mm

142-1040 F
Cylinder force
40 kN
Throat depth
range A =
100 mm

143-1080 F
Cylinder force
80 kN
Throat depth
range A =
100 mm

144-1080 F
Cylinder force
80 kN
Throat depth
range A =
100 mm



Connection examples for several punching units

Pneumatic punching units, single-action



An obligatory stripping unit can be implemented on request.

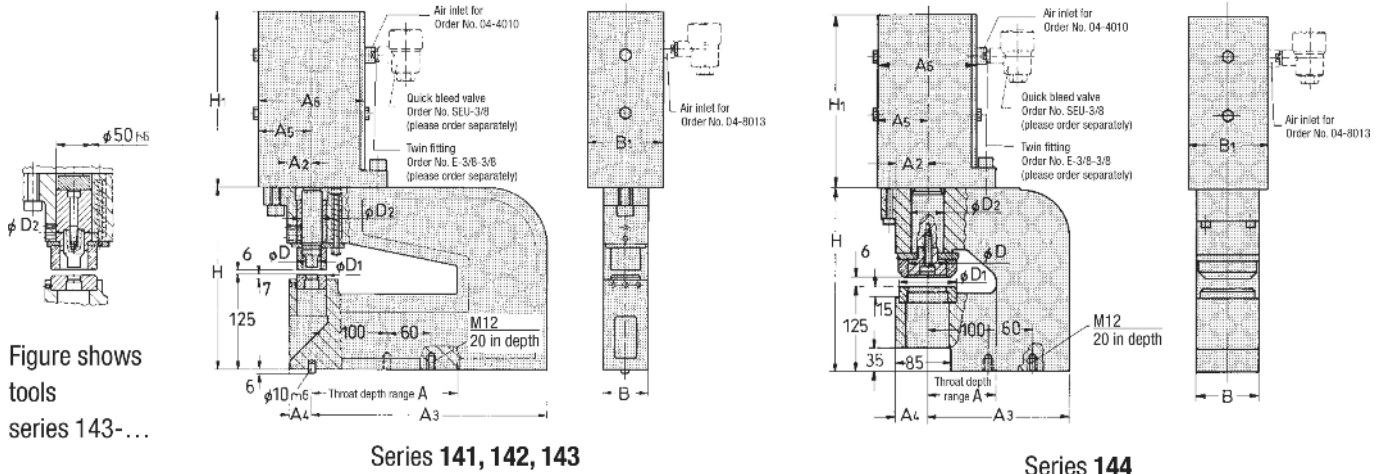
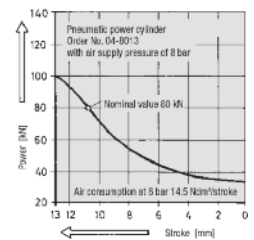
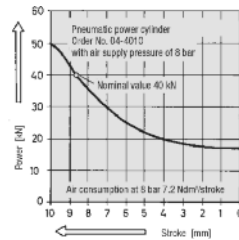
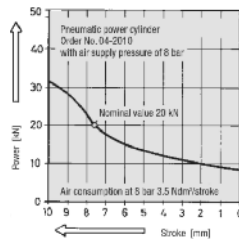


Figure shows tools series 143-...

Order No.	Throat depth range A	Hole Ø D	Max. force at 8 bar (kN)	A ₂	A ₃	A ₄	A ₅	A ₆	B	B ₁	D ₁	D ₂	H	H ₁	Cylinder type Order No.	Weight ~ (kg)
141-1012F	100	2-13	12	30	220	30	55	110	60	50	22	15	244	228	04-1212	22
141-1020F	100	2-13	20	30	220	30	61	122	60	65	22	15	244	300	04-2010	28
141-1040F	100	2-13	40	30	220	30	72	144	60	108	22	15	244	234	04-4010	33
141-1080F	100	2-13	80	30	220	30	77	154	60	122	22	15	244	405	04-8013	53
141-2012F	200	2-13	12	30	320	30	55	110	60	50	22	15	244	228	04-1212	28
141-2020F	200	2-13	20	30	320	30	61	122	60	65	22	15	244	300	04-2010	34
141-2040F	200	2-13	40	30	320	30	72	144	60	108	22	15	244	234	04-4010	39
141-2080F	200	2-13	80	30	320	30	77	154	60	122	22	15	244	405	04-8013	59
142-1012F	100	8-25 ¹⁾	12	30	220	30	55	110	60	50	42	28	244	228	04-1212	22
142-1020F	100	8-25 ¹⁾	20	30	220	30	61	122	60	65	42	28	244	300	04-2010	28
142-1040F	100	8-25 ¹⁾	40	30	220	30	72	144	60	108	42	28	244	234	04-4010	33
142-1080F	100	8-25 ¹⁾	80	30	220	30	77	154	60	122	42	28	244	405	04-8013	53
142-2012F	200	8-25 ¹⁾	12	30	320	30	55	110	60	50	42	28	244	228	04-1212	28
142-2020F	200	8-25 ¹⁾	20	30	320	30	61	122	60	65	42	28	244	300	04-2010	34
142-2040F	200	8-25 ¹⁾	40	30	320	30	72	144	60	108	42	28	244	234	04-4010	39
142-2080F	200	8-25 ¹⁾	80	30	320	30	77	154	60	122	42	28	244	405	04-8013	59
143-1040F	100	25-40 ²⁾	40	45	220	40	72	144	90	108	63	50	265	234	04-4010	46
143-1080F	100	25-40 ²⁾	80	45	220	40	77	154	90	122	63	50	265	405	04-8013	66
143-2040F	200	25-40 ²⁾	40	45	340	40	72	144	90	108	63	50	265	234	04-4010	59
143-2080F	200	25-40 ²⁾	80	45	340	40	77	154	90	122	63	50	265	405	04-8013	79
144-1040F	100	40-63	40	48	220	50	72	144	100	108	90	50	270	234	04-4010	60
144-1080F	100	40-63	80	48	220	50	77	154	100	122	90	50	270	405	04-8013	85
144-2040F	200	40-63	40	48	320	50	72	144	100	108	90	50	270	234	04-4010	79
144-2080F	200	40-63	80	48	320	50	77	154	100	122	90	50	270	405	04-8013	102

¹⁾ To punch hole diameters from 2-8 mm, you also have to order reduction bushes and reduction sockets.

²⁾ Punching tools for Ø 20-25 mm are available on request.



Punching tools suitable for the punching units above

Punching unit without punching tools	Punching tools have to be ordered separately				
	Round hole ●			Shaped punch ■■■■	
Order No.	Hole diameter meter range ØD	Punch kit Order No.	Punch Order No.	Die Order No.	Punch kit Order No.
141-...F	2-13	501-Ø-BL-ST	301-Ø	401-Ø-BL-ST	501-Formhole-BL-ST
142-...F	8-25 ¹⁾	502-Ø-BL-ST	302-Ø	402-Ø-BL-ST	502-Formhole-BL-ST
143-...F	25-40 ²⁾	503-Ø-BL-ST	303-Ø	403-Ø-BL-ST	503-Formhole-BL-ST
144-...F	40-63	524-Ø-BL-ST	324-Ø	404-Ø-BL-ST	on request

Insert in Order No.: Ø = hole Ø, BL = Material thickness, ST = material and strength. See also **punching tools**.

Subject to technical modifications.



Hydraulic punching units, double-action

Driven by hydraulic cylinder, double-action

Round and shaped cuts



Hole diameter

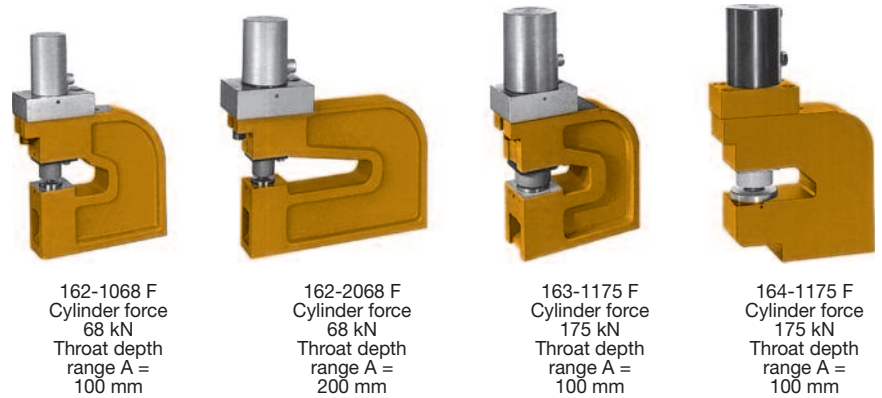
- for series 161 2-13 mm
- for series 162 8-25 mm
- for series 163 25-40 mm

Only round cut ● Shaped cut on request
for series 164 40-63 mm

Material thickness

- with steel 0,3-3 mm*, max. 5 mm*
- with aluminium and plastics 0,3-5 mm*

*The cylinder force has to exceed the required cutting force.

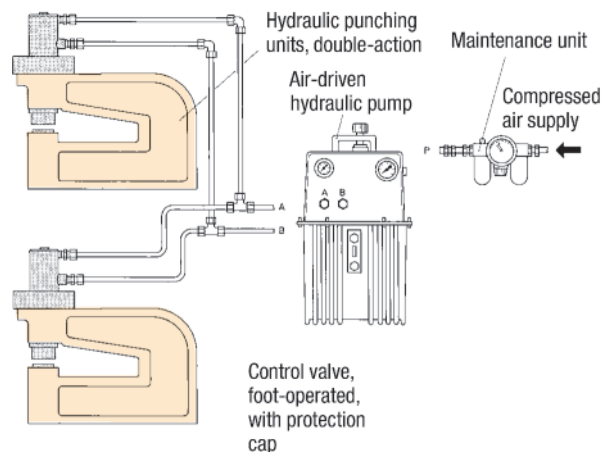


Connection examples

for one or several punching units

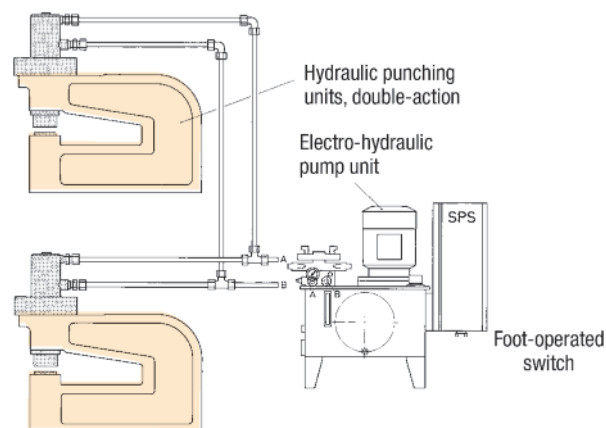
Power supply

Air-driven hydraulic pump



Power supply

Electro-hydraulic pump unit



Hydraulic punching units, fit with double-action hydraulic cylinders are capable of working independently from a press. They are driven by a hydraulic power supply, e.g. an air-driven hydraulic pump, or an electrohydraulic pump unit.

With the available hydraulic cylinders, cylinder forces of 33, 68, 109 or 175 kN can be achieved for an oil supply pressure of max. 350 bar. The material support height is 125 mm. The punching units should be selected according to the hole diameter, material thickness, material strength and the resulting cutting force required.

The cutting force required can be obtained from the chart.

The type of power supply also depends on the number of punching units in operation and the desired cycle time.

The connection examples on the left illustrate the operation of one or several hydraulic punching units.

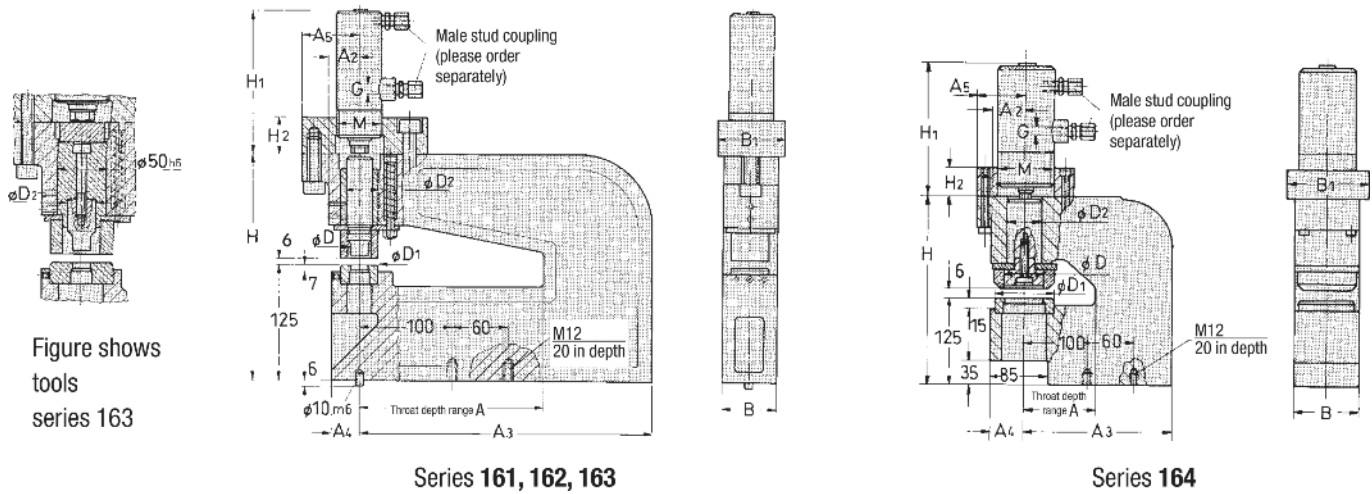
The mounting flanges of the hydraulic cylinders have the same mounting dimensions. As a result the cylinder size, including the mounting flange, can be exchanged if the cutting force is insufficient.

Subject to technical modifications.

Hydraulic punching units, double-action

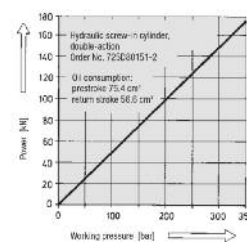
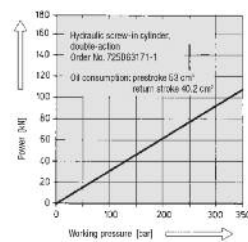
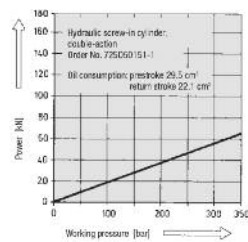
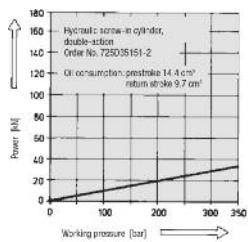


An obligatory stripping unit can be implemented on request.



Order No.	Throat depth range A	Hole ϕ D	Max. force at 350 bar (kN)	A ₂	A ₃	A ₄	A ₅	B	B ₁	D ₁	D ₂	H	H ₁	H ₂	M	G	Cylinder type including flange ⁹ Order No.	Weight ~ (kg)
161-1033 F	100	2-13	33	30	220	30	58	60	60	22	15	244	165	40	M48x1,5	G1/4	725D35151-FL	21
161-1068 F	100	2-13	68	30	220	30	60	60	80	22	15	244	151	40	M64x1,5	G1/4	725D50151-FL	23
161-1109 F	100	2-13	109	30	220	30	66	60	100	22	15	244	158	48	M80x2,0	G1/4	725D63171-FL	26
161-2033 F	200	2-13	33	30	320	30	58	60	60	22	15	244	165	40	M48x1,5	G1/4	725D35151-FL	27
161-2068 F	200	2-13	68	30	320	30	60	60	80	22	15	244	151	40	M64x1,5	G1/4	725D50151-FL	29
162-1033 F	100	8-25 ¹⁾	33	30	220	30	58	60	60	42	28	244	165	40	M48x1,5	G1/4	725D35151-FL	21
162-1068 F	100	8-25 ¹⁾	68	30	220	30	60	60	80	42	28	244	151	40	M64x1,5	G1/4	725D50151-FL	23
162-1109 F	100	8-25 ¹⁾	109	30	220	30	66	60	100	42	28	244	158	48	M80x2,0	G1/4	725D63171-FL	26
162-2033 F	200	8-25 ¹⁾	33	30	320	30	58	60	60	42	28	244	165	40	M48x1,5	G1/4	725D35151-FL	27
162-2068 F	200	8-25 ¹⁾	68	30	320	30	60	60	80	42	28	244	151	40	M64x1,5	G1/4	725D50151-FL	29
163-1033 F	100	25-40 ²⁾	33	45	220	40	58	90	60	63	50	265	170	40	M48x1,5	G1/4	725D35151-FL	34
163-1068 F	100	25-40 ²⁾	68	45	220	40	60	90	80	63	50	265	156	40	M64x1,5	G1/4	725D50151-FL	36
163-1109 F	100	25-40 ²⁾	109	45	220	40	66	90	100	63	50	265	161	48	M80x2,0	G1/4	725D63171-FL	39
163-1175 F	100	25-40 ²⁾	175	45	220	40	66	90	105	63	50	265	195	48	M80x2,0	G3/8	725D80151-FL	45
163-2033 F	200	25-40 ²⁾	33	45	340	40	58	90	60	63	50	265	170	40	M48x1,5	G1/4	725D35151-FL	47
163-2068 F	200	25-40 ²⁾	68	45	340	40	58	90	80	63	50	265	156	40	M64x1,5	G1/4	725D50151-FL	49
163-2109 F	200	25-40 ²⁾	109	45	340	40	66	90	100	63	50	265	161	48	M80x2,0	G1/4	725D63171-FL	52
164-1109 F	100	40-63	109	48	220	48	58	100	100	90	50	270	169	48	M80x2,0	G1/4	725D63171-FL	49
164-1175 F	100	40-63	175	48	220	48	66	100	105	90	50	270	195	48	M80x2,0	G3/8	725D80151-FL	55
164-2109 F	200	40-63	109	48	320	48	58	100	100	90	50	270	169	48	M80x2,0	G1/4	725D63171-FL	68
164-2175 F	200	40-63	175	48	320	48	66	100	105	90	50	270	195	48	M80x2,0	G3/8	725D80151-FL	73

FORMING

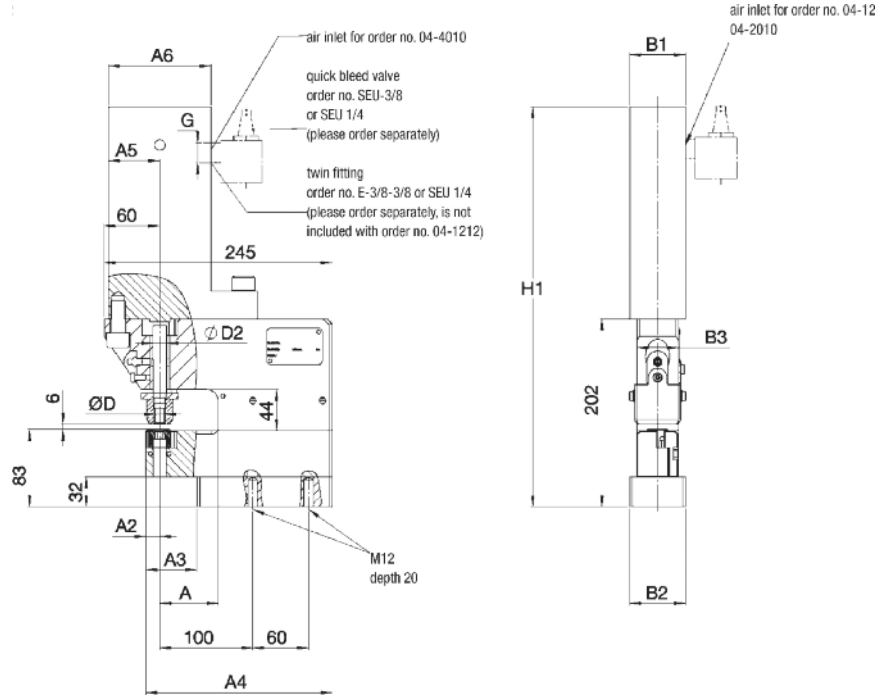
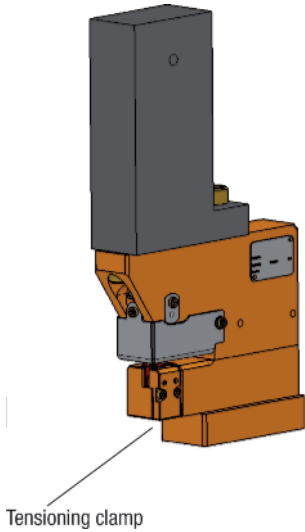


¹⁾ To punch hole diameters from 2-8 mm, you also have to order reduction bushes and reduction sockets.
²⁾ Punching tools for ϕ 20-25 mm are available on request.
⁴⁾ If you require the cylinder without the mounting flange, with the letters »FL« in the order no..

Punching tools suitable for the punching units above

Punching unit without punching tools		Punching tools have to be ordered separately			
		Round hole ●		Shaped punch ■■■■	
● + ■■■■ Order No.	Hole diameter meter range ϕ D	Punch kit Order No.	Punch Order No.	Die Order No.	Punch kit Order No.
161-...F	2-13	501- ϕ -BL-ST	301- ϕ	401- ϕ -BL-ST	501-Formhole-BL-ST
162-...F	8-25 ¹⁾	502- ϕ -BL-ST	302- ϕ	402- ϕ -BL-ST	502-Formhole-BL-ST
163-...F	25-40 ²⁾	503- ϕ -BL-ST	303- ϕ	403- ϕ -BL-ST	503-Formhole-BL-ST
164-...F	40-63	524- ϕ -BL-ST	324- ϕ	404- ϕ -BL-ST	on request

Insert in Order No.: ϕ = hole ϕ , BL = Material thickness, ST = material and strength. See also **punching tools**.
 Subject to technical modifications.



umatic profile punching units, single-action – without punching tools

Order No.	Hole ØD	Throat depth range A	Max. force with air supply pressure of 8 bar (kN)	Cylinder type ^{*)} Order No.	ØD2	A2	A3	A4	A5	A6	B1	B2	B3	G	H1	Weight ~ (kg)
141-0712F-01	2-13	63	12	04-1212	15	15	55	200	55	110	60	54	45	1xG1/4	430	19
141-0720F-01	2-13	63	20	04-2010	15	15	55	200	60	120	60	54	45	1xG3/8	502	24
141-0740F-01	2-13	63	40	04-4010	15	15	55	200	72	147	108	54	45	1xG3/8	436	30
142-0720F-01	8-25	63	20	04-2010	28	26	66	211	60	120	60	70	70	1xG3/8	502	32
142-0740F-01	8-25	63	40	04-4010	28	26	66	211	72	147	108	70	70	1xG3/8	436	37
142-0780F-01	8-25	63	80	04-8013	28	26	66	211	77	154	122	70	70	1xG3/8	607	59

*An obligatory stripping unit can be implemented on request. Order example: 141Z-07...

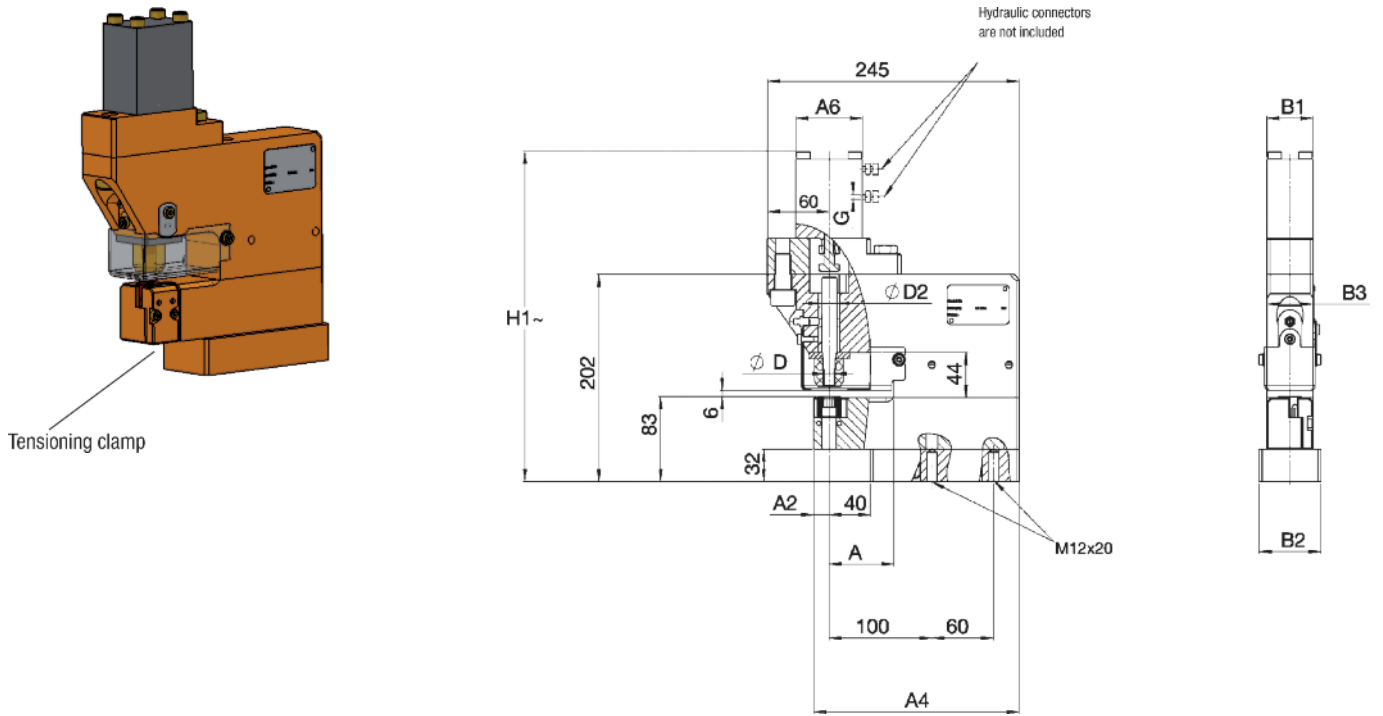
Punching tools suitable for the punching units above

Punching unit without punching tools		Punching tools have to be ordered separately			
		Round hole ●		Shaped punch ■■■■	
Order No.	Hole diameter meter range ØD	Punch kit Order No.	Punch Order No.	Die Order No.	Punch kit Order No.
141-...F	2-13	501-Ø-BL-ST	301-Ø	401-Ø-BL-ST	501-Formhole-BL-ST
142-...F	8-25	502-Ø-BL-ST	302-Ø	402-Ø-BL-ST	502-Formhole-BL-ST

Insert in Order No.: Ø = hole Ø, BL = Material thickness, ST = material and strength. See also **punching tools**.

Subject to technical modifications.

Hydraulic profile punching units, double-action



Hydraulic profile punching units, double action – without punching tools

Order No.	Hole ØD	Throat depth range A	Max. force with air supply pressure of 500 bar (kN)	Cylinder type ⁴⁾ Order No.	ØD2	A2	A4	A6	B1	B2	B3	G	H1	Weight ~ (kg)
161-0724F-01	2-13	63	24	722D25202-FL ⁴⁾	15	15	200	65	45	60	45	2xG1/4	322	16
161-0740F-01	2-13	63	40	722D32252-FL ⁴⁾	15	15	200	75	55	60	45	2xG1/4	339	18
161-0763F-01	2-13	63	63	722D40252-FL ⁴⁾	15	15	200	85	63	60	45	2xG1/4	340	19
162-0724F-01	8-25	63	24	722D25202-FL ⁴⁾	28	26	211	65	45	70	70	2xG1/4	317	24
162-0740F-01	8-25	63	40	722D32252-FL ⁴⁾	28	26	211	75	55	70	70	2xG1/4	339	25
162-0763F-01	8-25	63	63	722D40252-FL ⁴⁾	28	26	211	85	63	70	70	2xG1/4	340	26

⁴⁾If you require the cylinder without the mounting flange, owith the letters »FL« in the order no. An obligatory stripping unit can be implemented on request.

Punching tools suitable for the punching units above

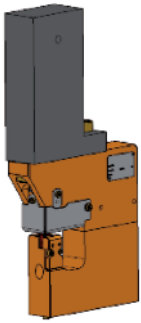
Punching unit without punching tools		Punching tools have to be ordered separately			
		Round hole ●			Shaped punch ■■■■
● + ■■■■ Order No.	Hole diameter meter range ØD	Punch kit Order No.	Punch Order No.	Die Order No.	Punch kit Order No.
161-...F	2-13	501-Ø-BL-ST	301-Ø	401-Ø-BL-ST	501-Formhole-BL-ST
162-...F	8-25	502-Ø-BL-ST	302-Ø	402-Ø-BL-ST	502-Formhole-BL-ST

Insert in Order No.: Ø = hole Ø, BL = Material thickness, ST = material and strength. See also **punching tools**.

Subject to technical modifications.

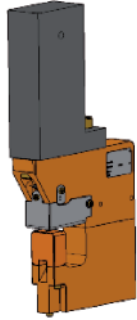


Pneumatic profile punching units, single-action



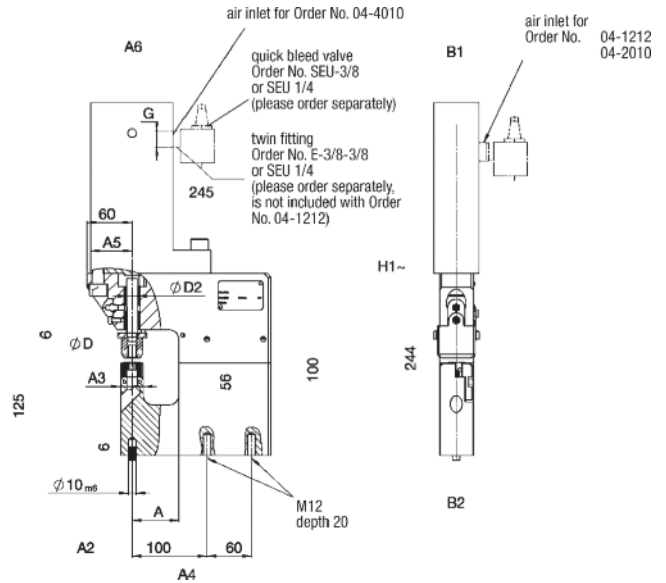
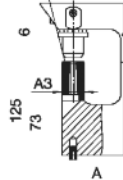
series: 141-08...-01
142-08...-01

pneumatic single-action drive



series: 141-08...-02
142-08...-02

illustration with block die series 141-08...-02 series 142-08...-02



FORMING

Pneumatic profile punching units, single-action – without punching tools

Order No.	Hole ØD	Throat depth range A	Max. force with air supply pressure of 8 bar (kN)	Cylinder type Order No.	ØD2	A2	A3	A4	A5	A6	B1	B2	G	H1 ~
141-0812F-01	2-13	63	12	04-1212	15	15	30	200	55	110	60	45	1xG1/4	472
141-0820F-01	2-13	63	20	04-2010	15	15	30	200	60	120	60	45	1xG3/8	544
141-0840F-01	2-13	63	40	04-4010	15	15	30	200	72	147	108	45	1xG3/8	478
141-0812F-02	2-13	63	12	04-1212	15	15	30	200	55	110	60	45	1xG1/4	472
141-0820F-02	2-13	63	20	04-2010	15	15	30	200	60	120	60	45	1xG3/8	544
141-0840F-02	2-13	63	40	04-4010	15	15	30	200	72	147	108	45	1xG3/8	478
142-0820F-01	8-25	63	20	04-2010	28	25	50	210	60	120	60	70	1xG3/8	544
142-0840F-01	8-25	63	40	04-4010	28	25	50	210	72	139	108	70	1xG3/8	478
142-0880F-01	8-25	63	80	04-8013	28	25	50	210	77	154	122	70	1xG3/8	649
142-0820F-02	8-25	63	20	04-2010	28	25	50	210	60	120	60	70	1xG3/8	544
142-0840F-02	8-25	63	40	04-4010	28	25	50	210	72	139	108	70	1xG3/8	478
142-0880F-02	8-25	63	80	04-8013	28	25	50	210	77	154	122	70	1xG3/8	649

An obligatory stripping unit can be implemented on request. Order example: 141Z-08 ...

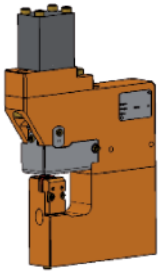
Punching tools suitable for the punching units above

Punching unit without punching tools		Punching tools have to be ordered separately			
		Round hole ●			Shaped punch ■■■■
Order No.	Hole diameter range ØD	Punch kit Order No.	Punch Order No.	Die Order No.	Punch kit Order No.
141-...F	2-13	501-Ø-BL-ST	301-Ø	401-Ø-BL-ST	501-Formhole-BL-ST
142-...F	8-25	502-Ø-BL-ST	302-Ø	402-Ø-BL-ST	502-Formhole-BL-ST

Insert in Order No.: Ø = hole Ø, BL = Material thickness, ST = material and strength. See also **punching tools**.

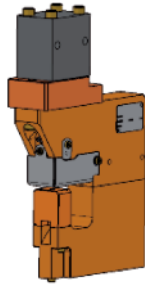
Subject to technical modifications.

Hydraulic profile punching units, double-action



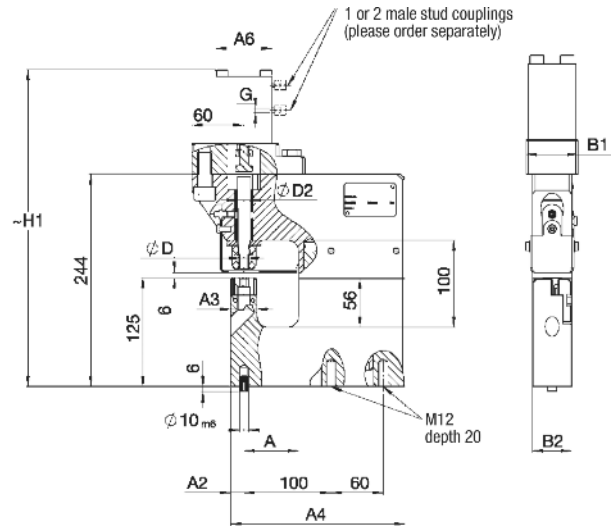
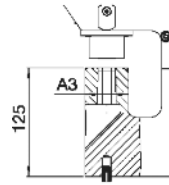
series: 161-08...-01
162-08...-01

hydraulic drive



series: 161-08...-02
162-08...-02
with block die

illustration
with block die
series 141-08...-02
series 161-08...-02



Hydraulic profile punching units – without punching tools

Order No.	Hole ØD	Throat depth range A	Max. force		Cylinder type flange ⁴⁾ for combination Order No.	ØD2	A2	A3	A4	A6	B1	B2	G	H1	Weight ~ (kg)
			with oil supply pressure of 350 bar (kN)	with oil supply pressure of 500 bar (kN)											
161-0824F-01	2-13	63	-	24	722D25202-FL ⁴⁾	15	15	30	200	65	45	45	2xG1/4	364	28
161-0840F-01	2-13	63	-	40	722D32252-FL ⁴⁾	15	15	30	200	75	60	45	2xG1/4	381	20
161-0863F-01	2-13	63	-	63	722D40252-FL ⁴⁾	15	15	30	200	85	70	45	2xG1/4	382	21
161-0824F-02	2-13	63	-	24	722D25202-FL ⁴⁾	15	15	30	200	65	45	45	2xG1/4	364	18
161-0840F-02	2-13	63	-	40	722D32252-FL ⁴⁾	15	15	30	200	75	60	45	2xG1/4	381	20
161-0863F-02	2-13	63	-	63	722D40252-FL ⁴⁾	15	15	30	200	85	70	45	2xG1/4	382	21
162-08068F-01	8-25	63	68	-	725D50151-FL ⁴⁾	28	25	50	210	Ø65	80	70	2xG1/4	405	31
162-08109F-01	8-25	63	109	-	725D63171-FL ⁴⁾	28	25	50	210	Ø97	100	70	2xG1/4	405	34
162-08175F-01	8-25	63	175	-	725D80151-FL ⁴⁾	28	25	50	210	Ø105	100	70	2xG3/8	440	41
162-08068F-02	8-25	63	68	-	725D50151-FL ⁴⁾	28	25	50	210	Ø65	80	70	2xG1/4	405	31
162-08109F-02	8-25	63	109	-	725D63171-FL ⁴⁾	28	25	50	210	Ø97	100	70	2xG1/4	405	34
162-08175F-02	8-25	63	175	-	725D80151-FL ⁴⁾	28	25	50	210	Ø105	100	70	2xG3/8	440	41

⁴⁾If you require the cylinder without the mounting flange, owith the letters »FL« in the Order No. An obligatory stripping unit can be implemented on request. Order example: 161Z-08 ...

Punching tools suitable for the punching units above

Punching unit without punching tools		Punching tools have to be ordered separately			
		Round hole ●			Shaped punch ■■■■
Punching unit Order No.	Hole diameter meter range ØD	Punch kit Order No.	Punch Order No.	Die Order No.	Punch kit Order No.
161-...F	2-13	501-Ø-BL-ST	301-Ø	401-Ø-BL-ST	501-Formhole-BL-ST
162-...F	8-25	502-Ø-BL-ST	302-Ø	402-Ø-BL-ST	502-Formhole-BL-ST

Insert in Order No.: Ø = hole Ø, BL = Material thickness, ST = material and strength. See also **punching tools**.

Subject to technical modifications.



Pneumatic and hydraulic 90°-notch units, 63x63 mm

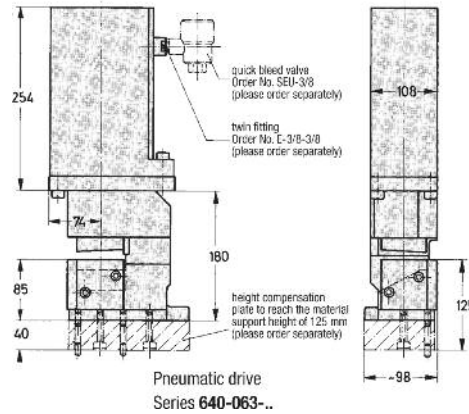
Examples



660-063-068 R
Cylinder force 68 kN

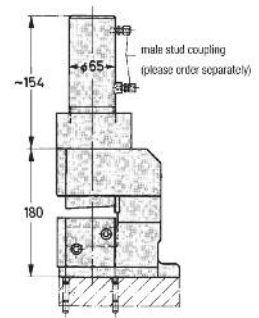


640-063-040 R
Cylinder force 40 kN



Pneumatic drive
Series 640-063-..

For missing sizes see unit 600 – 063



Hydraulic double-action drive
Series 660-063-..

2)Combination of cylinder and flange

In addition to the extremely successful press-operated 90° notch units with a notch size of 63 x 63 mm, the corresponding notch units with pneumatic and hydraulic operation are presented on this page. Liwiths on the use of these units are determined by the cutting force required. The cutting force, which results from the effective cut length and the material thickness, may not exceed the maximum power of the cylinder.

The material support height is **85 mm**.

To combine these notch units with other pneumatic or hydraulic punching it is necessary to install a height compensation plate (see chart) to reach the material support height of 125 mm.

Driven by
pneumatic power cylinder,
single-action, hydraulic cylinder,
double-action

Cutting angle 90°
Max. notch size 63x63 mm
Material thickness
with steel 0,3–3 mm*
with aluminium and
plastics 0,3–5 mm*

*The cylinder force has to exceed the required cutting force.

FORMING

Notch units with cutting tools		Notch size	Max. force		Cylinder type Flange type Order No.	Weight ~ (kg)	Gauging table, adjustable, please order separately Order No.	Height compen- sation plate, please order separately Order No.
pneumatic Order No.	hydraulic double-action Order No.		with air supply pressure of 8 bar (kN)	with air supply pressure of 350 bar (kN)				
640-063-040 L 640-063-040 R	- -	63x63	40	-	04-4010-05 ²⁾ F004-0018-0000	23	800-063 S	815-063
- -	660-063-068 L 660-063-068 R	63x63	-	68	725D50151-1 F004-0019-0000	21		

Subject to technical modifications.

Pneumatic and hydraulic rectangle notch units



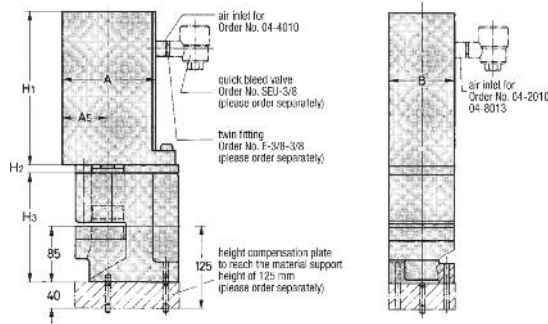
Examples



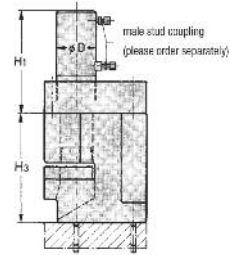
661-100-109
Cylinder force 109 kN



641-050-040
Cylinder force 40 kN



Pneumatic drive
Series 641



Hydraulic double-action drive
Series 661

Driven by
pneumatic power cylinder,
single-action, hydraulic cylinder,
double-action

Notch shape rectangle
for 641-050..., 661-050-...
50x50 mm
for 641-050..., 661-100-...
100x75 mm

Material thickness 0,3–3 mm*

*The cylinder force has to exceed the required cutting force.

In addition to the extremely successful press-operated rectangle notch units with a notch size of 50 x 50 mm and 100 x 75 mm, the corresponding notch units with pneumatic and hydraulic operation are presented on this page.

Liwiths on the use of these units are determined by the cutting force required, see chart. The cutting force, which results from the effective cut length and the material thickness, may not exceed the maximum power of the cylinder.

The material support height is **85 mm**.

To combine these notch units with other pneumatic or hydraulic punching units it is necessary to install a height compensation plate (see chart) to reach the material support height of 125 mm. For the dimensions of the basic structure, see drawing for units 601 – 050 or 601 – 100.

FORMING

Notch units with cutting tools		Notch size Width x depth	Max. force		Cylinder type 2)Combination of cylinder and flange Order No.	Cylinder dimensions						Weight ~ (kg)	Height compensation plate, please order separately Order No.	
pneumatic Order No.	hydraulic double-action Order No.		with air supply pressure of 8 bar (kN)	with oil supply pressure of 350 bar (kN)		A	A5	B	ØD	H1 ~	H2 ~			H3 ~
641-050-040	–	50x50	40	–	04-4010-06 ²⁾	144	72	108	–	234	20	165	32	815-050
641-100-040	–	100x75	40	–	04-4010	144	72	108	–	234	40	182	39	815-100
641-100-080	–	100x75	80	–	04-8013	154	77	122	–	405	40	182	63	815-100
–	661-050-068	50x50	–	68	725D50151-1	–	–	–	65	174	20	165	23	815-050
–	661-100-109	100x75	–	109	725D63171-1	–	–	–	97	189	40	182	37	815-100

Subject to technical modifications.



Pneumatic and hydraulic 90° radii cutting units, R5-30mm

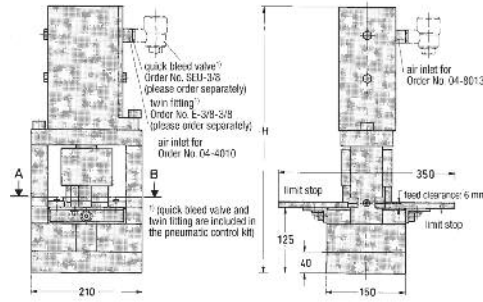
Examples



666-30-063
Cylinder force 63 kN

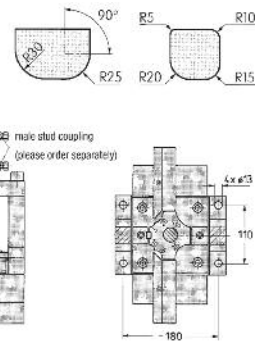


646-30-040
Cylinder force 40 kN



Pneumatic drive
Series 646

Examples



Hydraulic double-action drive
Series 666-30-063

Section A-B

In addition to the press-operated radii cutting units, the corresponding hydraulic or pneumatic units are presented on this page.

With these units it is possible to notch 6 different 90° radii with only one tool. The radii are graduated in steps of 5 mm from R 5 mm up to R 30 mm.

Liwiths on the use of these units are determined by the cutting force required, see chart. The cutting force, which results from the effective cut length and the material strength, may not exceed the maximum power of the cylinder.

The material support height is **125 mm**.

Recommended accessories (please order separately)

For connecting the pneumatic radii cutting units to the compressed air system, we recommend the following accessories:

Other radii sizes are available on request.

Driven by
pneumatic power cylinder,
single-action hydraulic cylinder,
double-action

possible radii

R 5, 10, 15, 20, 25, 30 mm

cutting angle α 90°

Material thickness

with steel 0,3–3 mm*

with aluminium and plastics
0,3–5 mm*

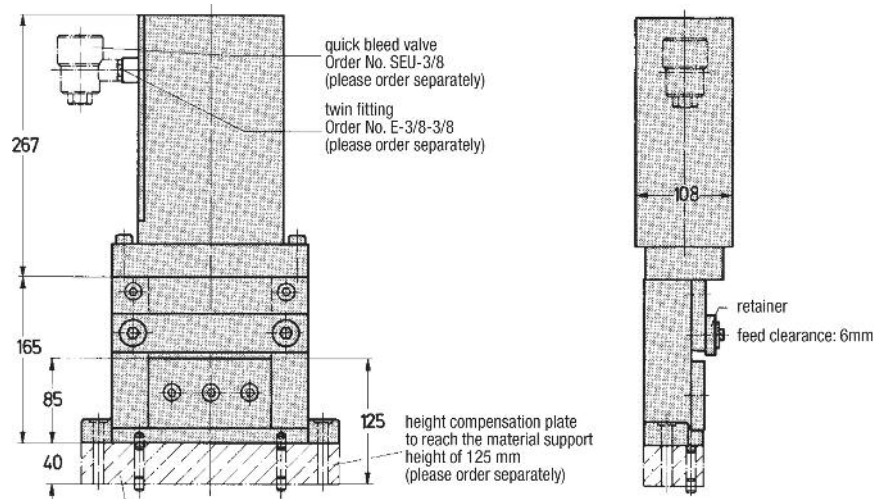
*The cylinder force has to exceed the required cutting force.

FORMING

Radii cutting units with cutting tools		Possible 90° radii in steps of 5 mm	Max. force		Cylinder type Order No.	H	Weight ~ (kg)
pneumatic Order No.	hydraulic double-action Order No.		with air supply pressure of 8 bar (kN)	with oil supply pressure of 350 bar (kN)			
646-30-040	–	R5, R10, R15, R20, R25, R30	40	–	04-4010	504	58
646-30-080	–		80	–	04-8013	675	79
–	666-30-063		–	63	722050252-1	375	45

Subject to technical modifications.

Pneumatic cut-off unit, 125 mm



The retainer has been removed in the illustration!

649-125-040N
Cylinder force 40 kN

Driven by
pneumatic power cylinder,
single-action

max. cutting width 125 mm
Material thickness
 with steel 0,3–3 mm*
 with aluminium and plastics
 0,3–5 mm*

*The cylinder force has to exceed the required cutting force.

In addition to the extremely successful press-operated cut-off units with a cutting width of 125 mm, the corresponding cut-off unit with pneumatic operation is presented on this page.

The cutting force, which results from the effective cut length and the material strength, may not exceed the maximum power of the cylinder.

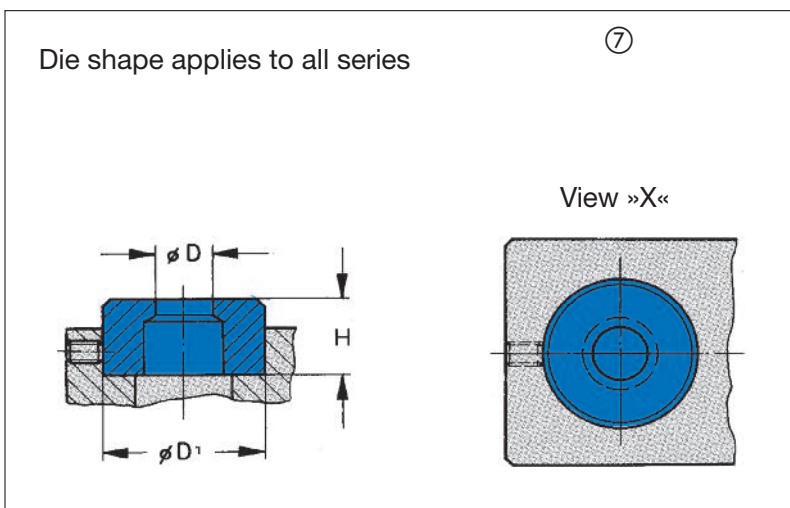
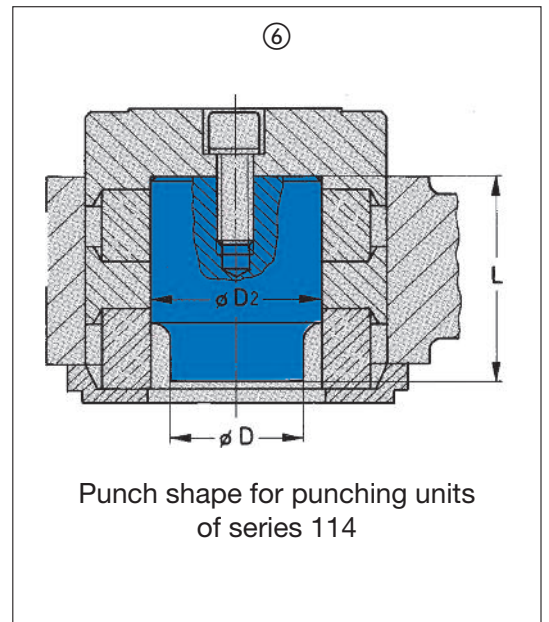
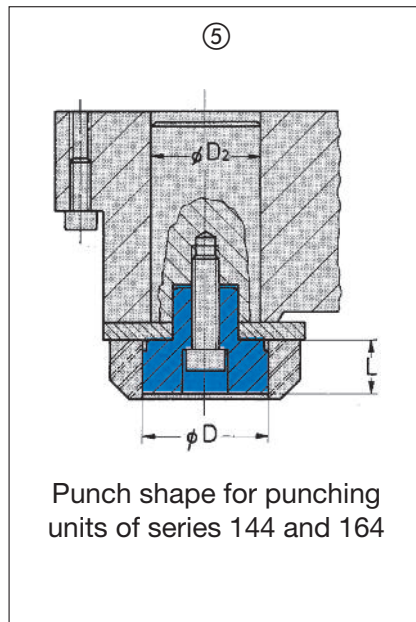
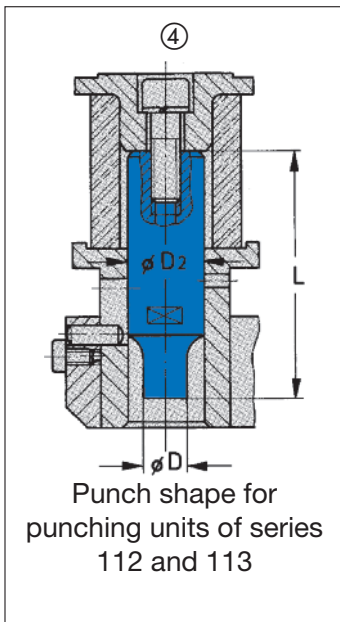
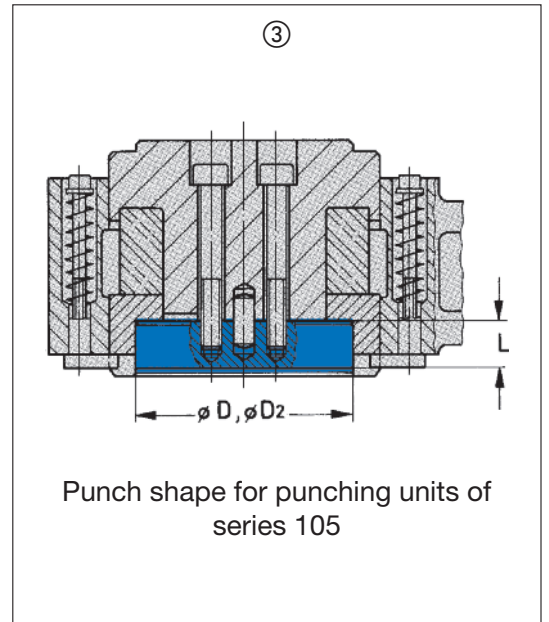
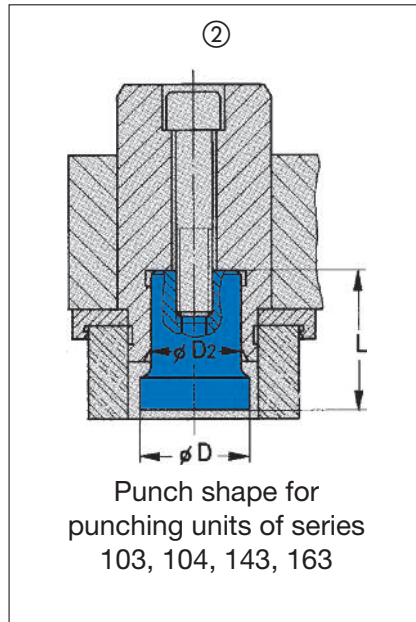
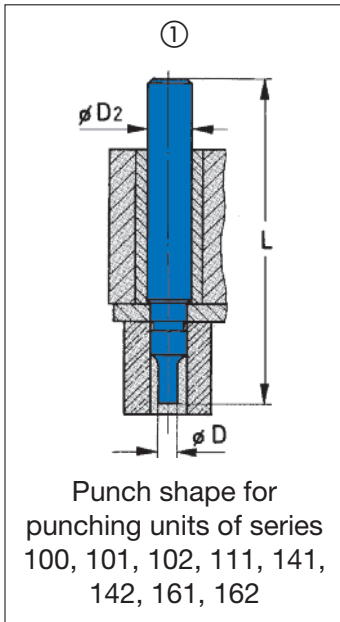
The material support height is **85 mm**.

To combine this cut-off unit with other pneumatic punching units it is necessary to install a height compensation plate (see chart) to reach the material support height of 125 mm. **For the dimensions of the basic structure, see drawing for unit 610 – 125 N.**

Subject to technical modifications.

Cut-off unit with cutting tools with retainer pneumatic Order No.	Cutting width	Max. force with air supply pressure of 8 bar (kN)	Cylinder type ²⁾ Combination of cylinder and flange (kN)	Weight (kg)	Height compensation plate please order separately Order No.
649-125-040-N	125	40	04-4010-03 ²⁾	32	815-125

Round hole punching tools ● · technical illustration of punches and dies



Subject to technical modifications.

Round hole punching tools

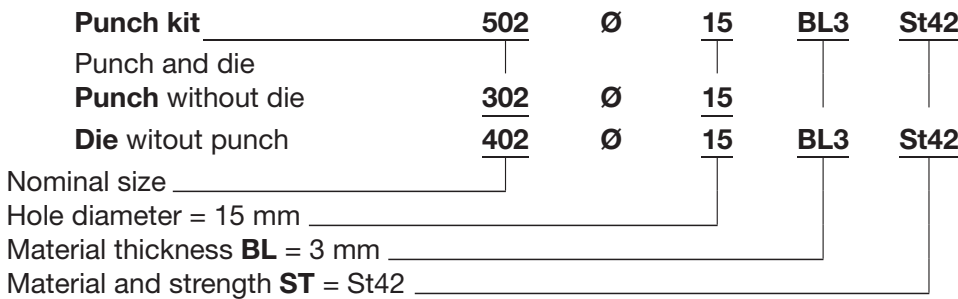
The required die clearance is preset in the factory in accordance with the desired hole size, while considering the specified material thickness and material strength.

By using reduction bushes and sockets holes can be punched with a smaller hole diameter than specified for the particular series for some of the punching units.

Punching units for round cuts can easily and quickly be converted to shaped hole punching units, using a shaped cut conversion kit.

Order example

Round hole punching tool for punching unit order no. 102-200F




(for nonferrous material, e.g.: Al F22)

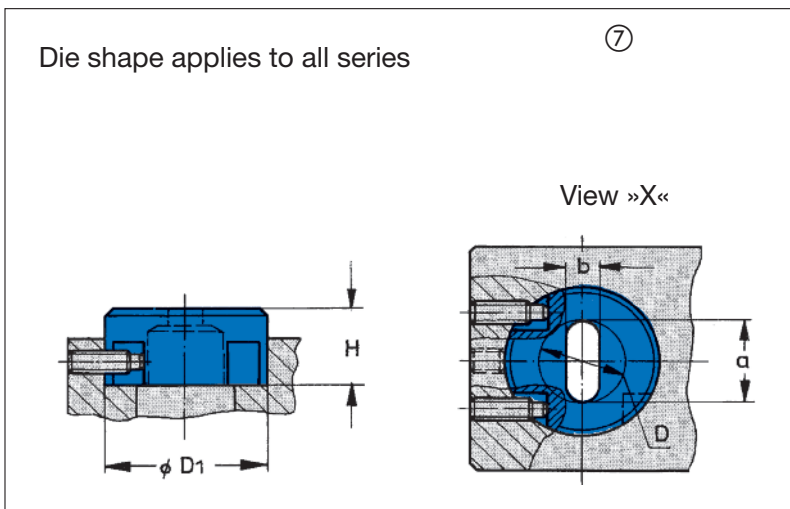
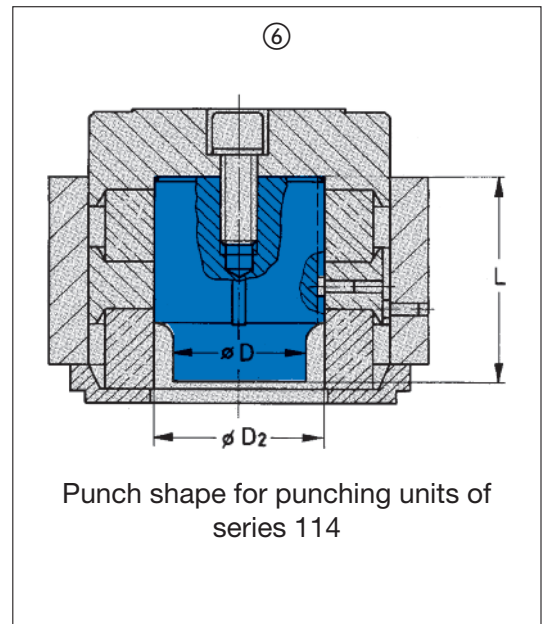
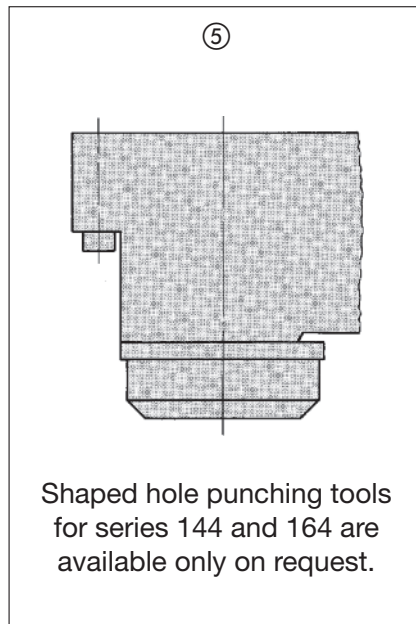
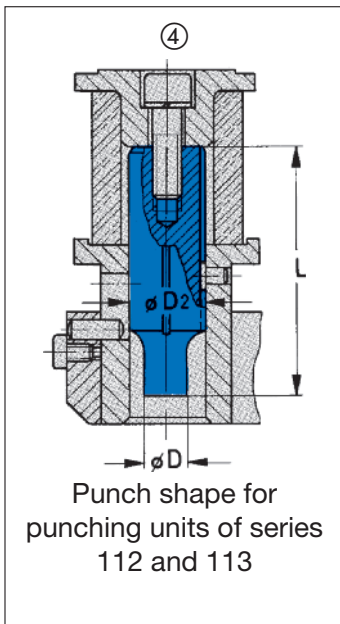
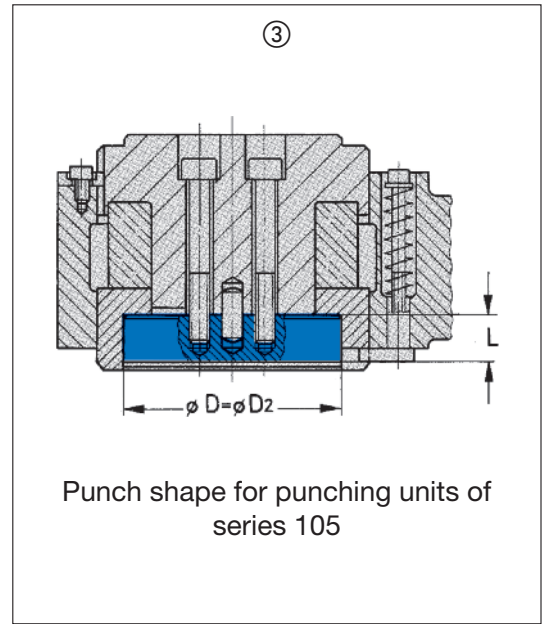
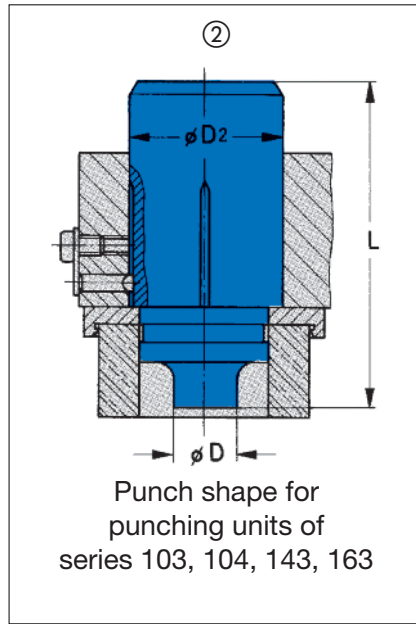
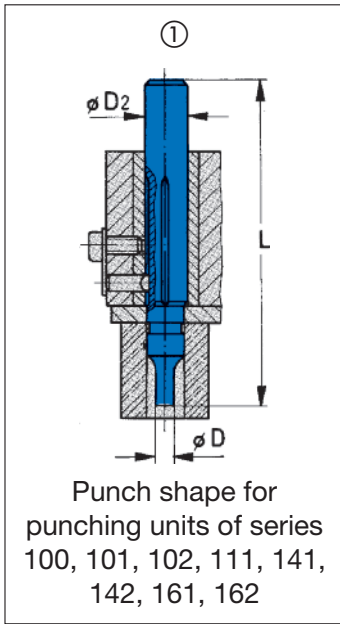
Round hole punching tools ● · punch kits, punches, dies, [sizes on stock](#)

for punching units of series	Sizes on stock			Available hole diameters		Dimensions				Corresponding drawings page before
	Punch kit	Punch	Die	Drawings on the left		ØD ₂	L	ØD ₁	H	
	Order No.	Order No.	Order No.	Range ØD	Graduation [mm]					
100-	500-Ø-BL-ST	300-Ø	400-Ø-BL-ST	2-7	0,5	8	105	15	16	① + ⑦
101- 111- 141- 161-	501-Ø-BL-ST	301-Ø	401-Ø-BL-ST	2-13	0,5	15	105	22	20	
102- 142- 162-	502-Ø-BL-ST	302-Ø	402-Ø-BL-ST	8-25	1	28	105	42	20	
103- 143- 163-	503-Ø-BL-ST	303-Ø	403-Ø-BL-ST	25-40 special size 20-25 available	1	30	45	63	25	② + ⑦
104-	504-Ø-BL-ST	304-Ø	404-Ø-BL-ST	40-63	only hole Ø 40, 42, 45, 50, 55, 60, 63	50	45	90	25	
105-	505-Ø-BL-ST	305-Ø	405-Ø-BL-ST	63-100	all sizes available as special size	63 bis 100	22	145	25	③ + ⑦
112-	512-Ø-BL-ST	312-Ø	402-Ø-BL-ST	8-22	1	25	80	42	20	④ + ⑦
113-	513-Ø-BL-ST	313-Ø	403-Ø-BL-ST	22-38	1	40	80	63	25	
114-	514-Ø-BL-ST	314-Ø	404-Ø-BL-ST	35-63	all sizes available as special size	63	80	90	25	⑥ + ⑦
144- 164-	5024-Ø-BL-ST	324-Ø	404-Ø-BL-ST	40-63		50	24	90	25	⑤ + ⑦

Special sizes are available for each size within the diameter range

Subject to technical modifications.

Shaped hole punching tools  · punch kits, sizes on stock and special sizes



Subject to technical modifications.

Shaped hole punching tools

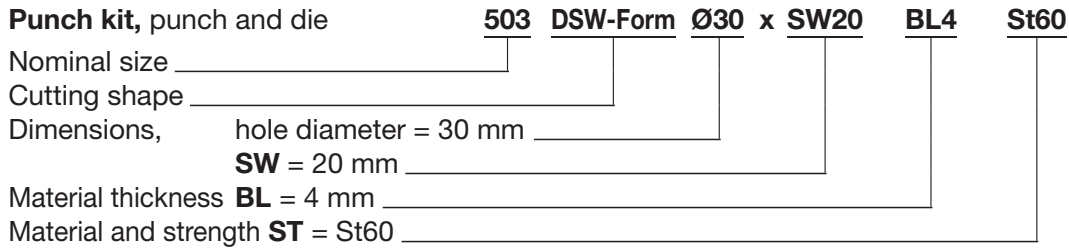
The max. outside profile of a shaped cut may not exceed the max. possible hole diameter.

The required die clearance for the die is preset in accordance with the desired hole size, while considering the specified material thickness and material strength.

Shaped hole punching tools can be used »lengthways« or »crosswise« to the punching unit.

Order example

Shaped hole punching tool »DSW-Form« (means DAF shape, with D = diameter and AF = width across flat) as special size for punching unit order no. 103-200 F



(for nonferrous material, e.g.: Al F22)

Shaped hole punching tools · punch kits, **sizes on stock and special sizes**

for punching units of series	Sizes on stock	Special sizes	Range	Dimensions Drawings on the left				Corresponding drawings page before	Shaped cut conversion kit only for punching units which have been ordered without shaped cut conversion kit
	Langloch → a → b →	Langloch → a → b → Quadrat → a → DSW Form → D → Rechteck → a → b →		ØD	ØD ₂	L	ØD ₁		H
100-	-	-	2-7	-	-	-	-	-	-
101- 111- 141- 161-	501-Langloch-4,5x10-BL-ST 501-Langloch-5,5x12-BL-ST 501-Langloch-7x12-BL-ST	501-Langloch-a x b-BL-ST 501-DSW-Form-DxSW-BL-ST 501-Quadrat-a x a-BL-ST 501-Rechteck-a x b-BL-ST	2-13	15	105	22	20	① + ⑦	805-101 805-111 805-141 805-161
102- 142- 162-	502-Langloch-5,5x20-BL-ST 502-Langloch-7x20-BL-ST 502-Langloch-9x22-BL-ST 502-Langloch-11x25-BL-ST 502-Langloch-13x25-BL-ST	502-Langloch-a x b-BL-ST 502-DSW-Form-DxSW-BL-ST 502-Quadrat-a x a-BL-ST 502-Rechteck-a x b-BL-ST	8-25	28	105	42	20	① + ⑦	805-102 805-142 805-162
103- 143- 163-	-	503-Langloch-a x b-BL-ST 503-DSW-Form-DxSW-BL-ST 503-Quadrat-a x a-BL-ST 503-Rechteck-a x b-BL-ST	20-40	50	105	63	25	② + ⑦	805-103 805-143 805-163
104-	-	504-Langloch-a x b-BL-ST 504-DSW-Form-DxSW-BL-ST 504-Quadrat-a x a-BL-ST 504-Rechteck-a x b-BL-ST	40-63	75	105	90	25	② + ⑦	805-104
105-	-	505-Langloch-a x b-BL-ST 505-DSW-Form-DxSW-BL-ST 505-Quadrat-a x a-BL-ST 505-Rechteck-a x b-BL-ST	63-100	63 bis 100	22	145	25	③ + ⑦	805-105
112-	512-Langloch-7x20-BL-ST 512-Langloch-9x22-BL-ST 512-Langloch-11x22-BL-ST 512-Langloch-13x22-BL-ST	512-Langloch-a x b-BL-ST 512-DSW-Form-DxSW-BL-ST 512-Quadrat-a x a-BL-ST 512-Rechteck-a x b-BL-ST	8-22	25	80	42	20	④ + ⑦	805-112
113-	-	513-Langloch-a x b-BL-ST 513-DSW-Form-DxSW-BL-ST 513-Quadrat-a x a-BL-ST 513-Rechteck-a x b-BL-ST	22-38	40	80	63	25	④ + ⑦	805-113
114-	-	514-Langloch-a x b-BL-ST 514-DSW-Form-DxSW-BL-ST 514-Quadrat-a x a-BL-ST 514-Rechteck-a x b-BL-ST	35-63	63	80	90	25	⑥ + ⑦	805-114

Subject to technical modifications.

Reduction Bushes



Reduction bush



Reduction socket

Reduction bushes and sockets only for round hole punching tools

When using reduction bushes and sockets with the punching units of the series 101 to 163, the punch and die of the next smaller punching unit may be used.

This extends the application range of the listed punching units by the reduced diameter given in the table below.

Due to the possibility of using the next smaller punching tool size, additional tool units are no longer required and, thereby, costs are reduced.

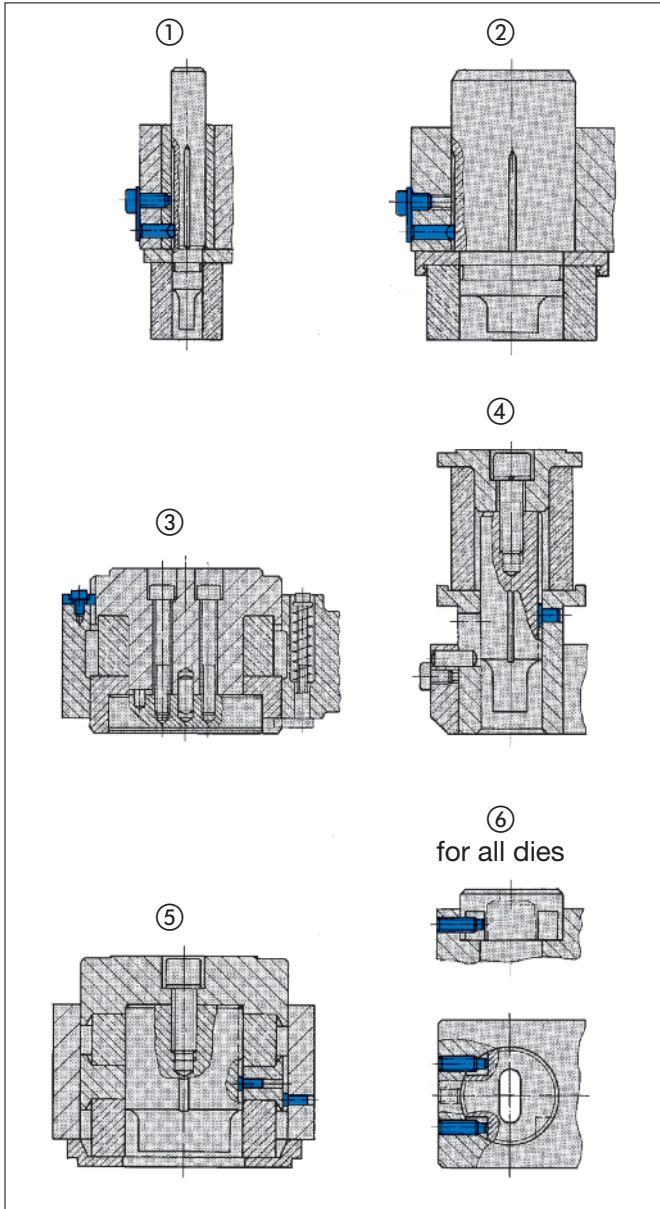
FORMING

for punching units of series	Punch diameter range without reduction parts		Punch diameter range with reduction parts		Reduction parts				Required cutting tools			
	standard Ø	Fig.	reduced Ø	Fig.	Reduction bush		Reduction socket		Punch	Die		
					complete with work-piece stripper	ØD	Ød	ØD			Ød	
101 111 141 161	2-13		2-7		 Order No.			 Order No.	 Order No.	 Order No.		
					850-15x08	15	8	860-22x15	22	15	300-Ø...	400-Ø-BL-ST

for punching units of series	Punch diameter range without reduction parts		Punch diameter range with reduction parts		Reduction parts				Required cutting tools			
	standard Ø	Fig.	reduzierter Ø	Fig.	Reduction bush		Reduction socket		Punch	Die		
					complete with work-piece stripper	ØD	Ød	ØD			Ød	
102 142 162	8-25		2-13		 Order No.			 Order No.	 Order No.	 Order No.		
					850-28x15	28	15	860-42x15	42	15	301-Ø...	400-Ø-BL-ST From hole diameters of 8 mm onwards, use die 402-Ø-BL-ST

for punching units of series	Punch diameter range without reduction parts		Punch diameter range with reduction parts		Reduction parts				Required cutting tools			
	standard Ø	Fig.	reduced Ø	Fig.	Reduction bush		Reduction socket		Punch	Die		
					complete with work-piece stripper	ØD	Ød	ØD			Ød	
103 143 163	25-40		8-25		 Order No.			 Order No.	 Order No.	 Order No.		
					850-50x28	50	28	860-63x42	63	42	302-Ø...	402-Ø-BL-ST

Subject to technical modifications.

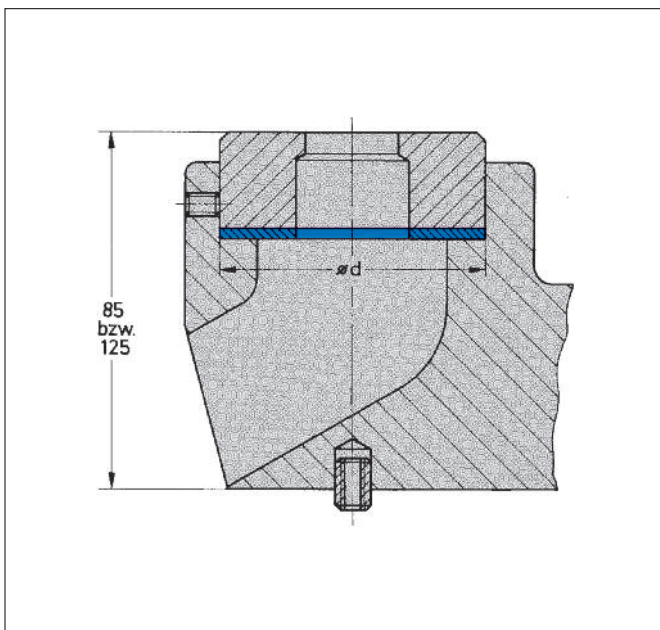


Shaped cut conversion kits

All punching units for round cuts (except for series 100) can easily and quickly be converted to shaped hole punching units, using a shaped cut conversion kit.

A shaped cut torsion lock is included in the standard delivery of all punching units (except for series 100).

for punching unit series	Corresponding figures	Order No.
101	① + ⑥	805-101
102	① + ⑥	805-102
103	② + ⑥	805-103
104	② + ⑥	805-104
105	③ + ⑥	805-105
111	① + ⑥	805-111
112	④ + ⑥	805-112
113	④ + ⑥	805-113
114	⑤ + ⑥	805-114
141	① + ⑥	805-141
142	① + ⑥	805-142
143	② + ⑥	805-143
161	① + ⑥	805-161
162	① + ⑥	805-162
163	② + ⑥	805-163



Compensating washers

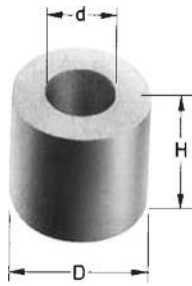
Compensating washers are required to bring reworked dies to the working or material support height of 85 or 125 mm.

This height compensation is particularly important when several punching units are to be combined to a series punch installation. In this case, uniform working and material support height is essential.

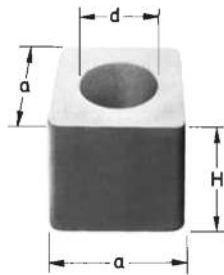
$\varnothing d$	for dies		1 kit = 4 pieces thickness	Order No.
	Series	to be used for punching of series		
15	400	100	0,1 0,3 0,5 1,0 mm	806-15
22	401	101, 111, 141, 161		806-22
42	402, 412	102, 112, 142, 162		806-42
63	403, 413	103, 113, 143, 163		806-63
90	404, 414	104, 114		806-90

Subject to technical modifications.

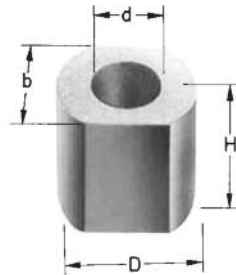
Polyurethane workpiece stripper



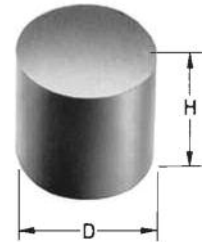
Shape A



Shape B

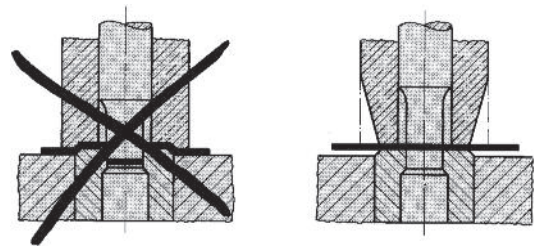


Shape C



Shape D

Note When punching in thin metal sheets, the outside diameter of the polyurethane stripper lying on the metal sheet should be skewed and adapted to the diameter of the die. This prevents undesirable deformation of the metal sheet caused by the stripper.

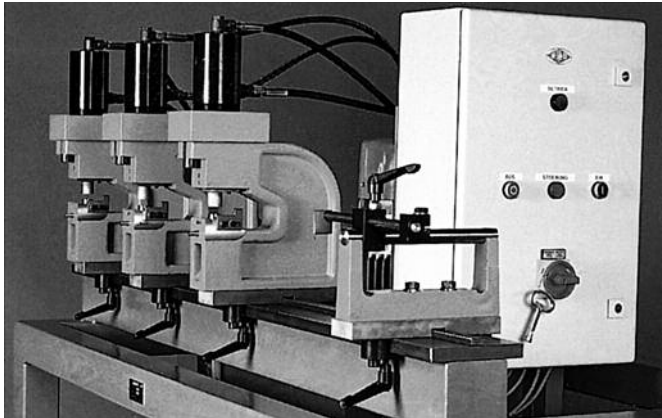


for punching units of series														Shape	Stripping force	Dimensions					Order No.
100	101 111	102	103	104	105	112	113	114 1 Satz= 2 Stück	141 161	142 162	143 163	144 164	a			b	Ød	ØD	H		
●										●				A	medium	-	-	6,5	18	30	801-018x30
														A	small	-	-	12	28	27	801-028x27
	●													A	medium	-	-	12	28	30	801-028x30
											●			A	small	-	-	25	40	27	801-040x27
											●			A	medium	-	-	25	40	30	801-040x30
		●												A	large	-	-	25	50	30	801-050x30
												●		A	small	-	-	41	60	28	801-060x28
												●		A	medium	-	-	41	60	30	801-060x30
			●											A	large	-	-	41	70	30	801-070x30
								●						A	large	-	-	64	95	30	801-095x30 ²⁾
													●	A	large	-	-		100	27	801-100x27
				●										A	large	-	-	64	100	30	801-100x30
					●									A	large	-	-	76	112	40	801-112x40
● ¹⁾														C	large	-	17	6,5	25	31	802-025x31 ¹⁾
	● ¹⁾													B	large	28	-	12	-	31	802-028x31 ¹⁾
							●							B	large	50	-	29	-	50	802-050x50
								●						B	large	70	-	45	-	50	802-070x50
* Polyurethane strippers, shape D (fullmaterial), are provided for special applications and are supplied in the requested length. Add the requested length »H« to the order no. The hole (Ød) is provided by the customer.														D	-	-	-	-	28	*	803-028xH*
														D	-	-	-	-	50	*	803-050xH*
														D	-	-	-	-	70	*	803-070xH*
														D	-	-	-	-	100	*	803-100xH*

¹⁾ Reinforced version for higher retraction forces when punching thick materials

²⁾ 1 kit = 2 pieces

Subject to technical modifications.



Guide elements in a series punch installation with hydraulic double-action operation for punching a punch layout in steel strips.

These guide elements provide a simple and cost effective sidetracking solution for all pneumatic and hydraulic punching units used in series punch installations.

The side-tracking clamp plates are used to mount the punching units and enable changing the distance between the punching units. The side-tracking clamp plates are mounted on the base plate.

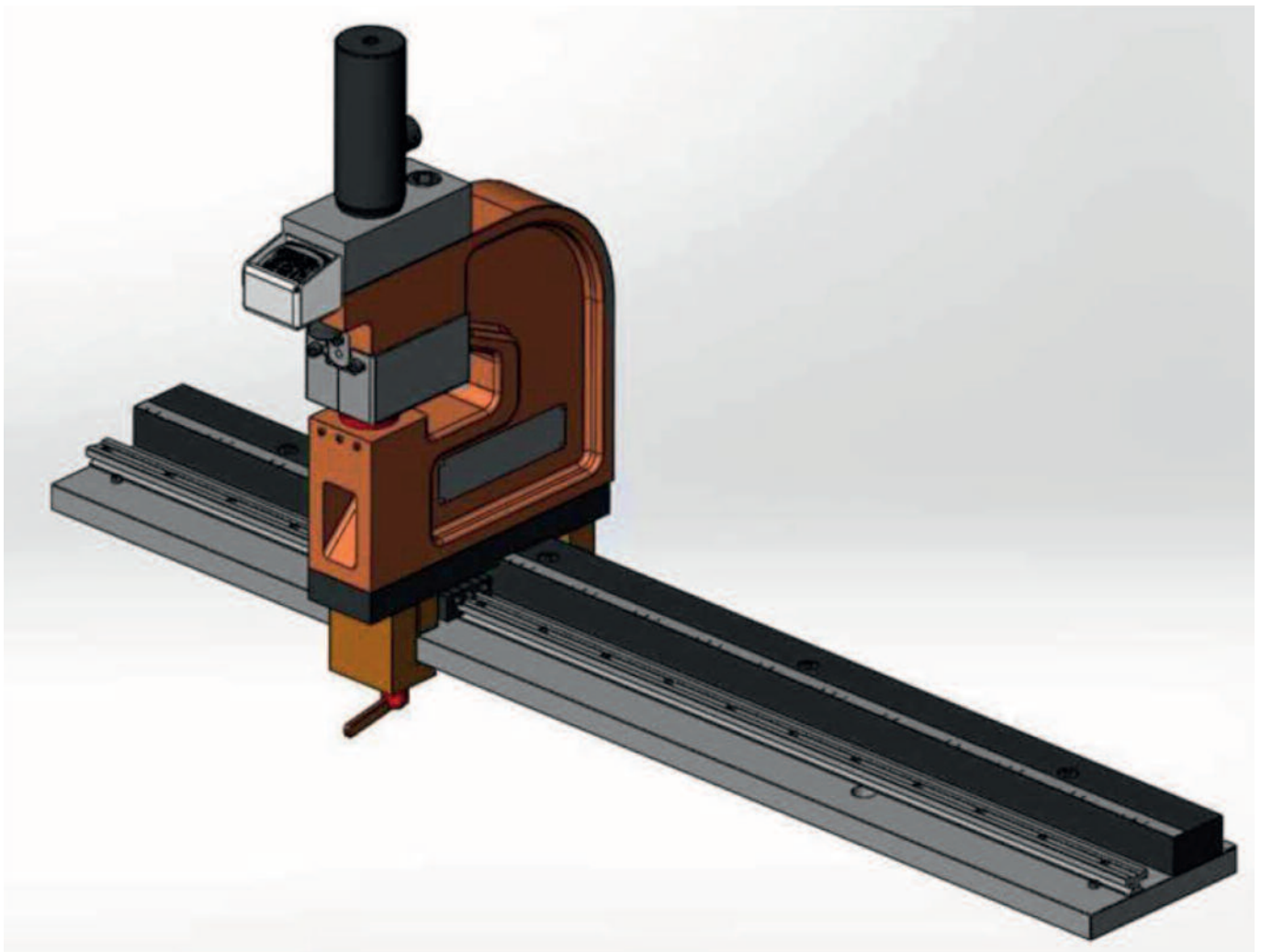
Each side-tracking clamp plate has a guide groove at the bottom which fits onto the guide rail of the base plate and guides the sidetracking clamp plate and therefore the punching unit.

The quick-action clamping lever enables the side-tracking clamp plate to be secured in the desired position on the base plate.

The base plate has threaded holes on the bottom to facilitate mounting on a basic construction. The customer provides the basic construction.

On request, the base plates are also available with a fixed scale on top of the rail.

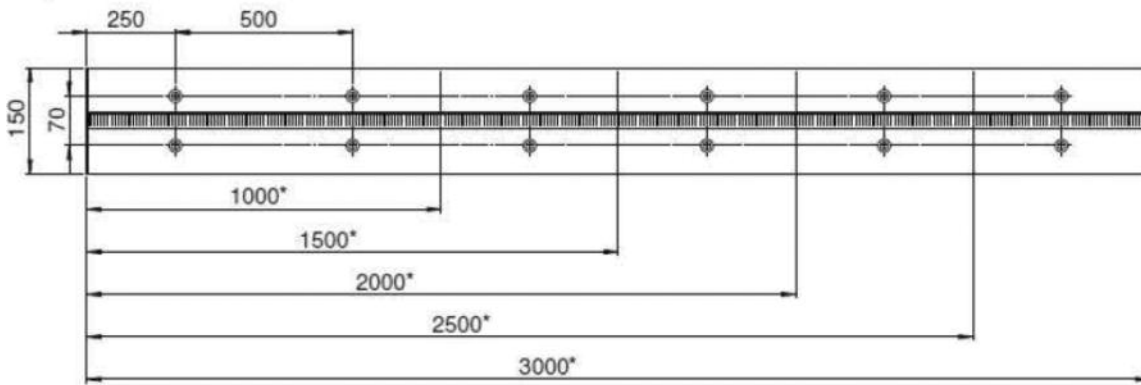
Further combinations of guide elements with pneumatic and hydraulic tool units for notching flat materials and profiles in steel, aluminium and plastics are available on request.



Subject to technical modifications.

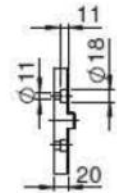
Base plate			
Order No.	Please add the requested total length to the order no. (mm)	Comment	Weight (kg)
820-150x...M	1000	with mm scale	24
	1500		35
	2000		47
	2500		59
	3000		71
822-150x...M	1000	with mm scale and linear guide	25
	1500		38
	2000		51
	2500		64
	3000		76
822-150x...D	1000	with linear guide and magnetic tape for length measurement	25
	1500		38
	2000		51
	2500		64
	3000		76

Base plate



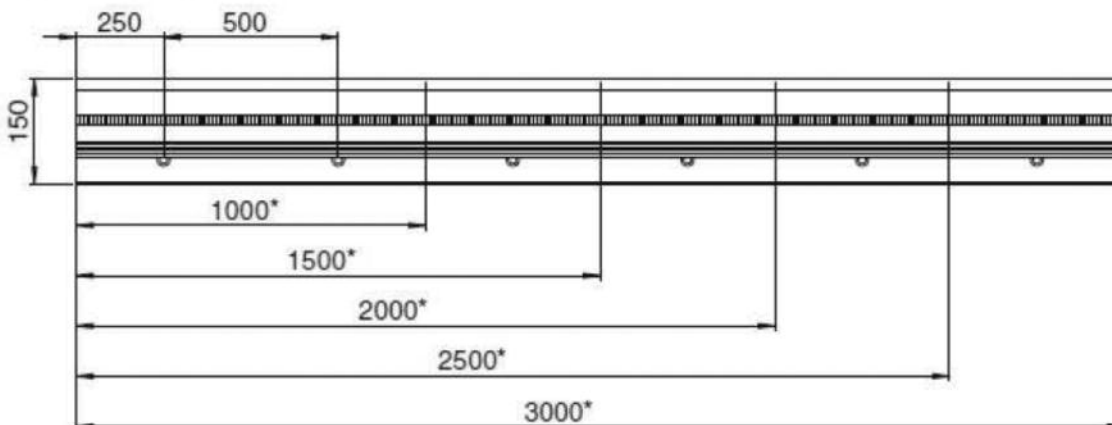
Base plate with scale

Order no. 822-150 x total length M



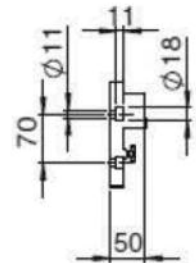
*Available total length

Base plate with linear guides



Base plate with scale

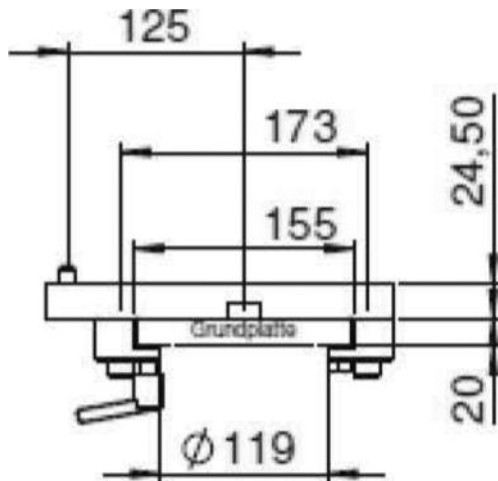
Order no. 820-150 x total length M



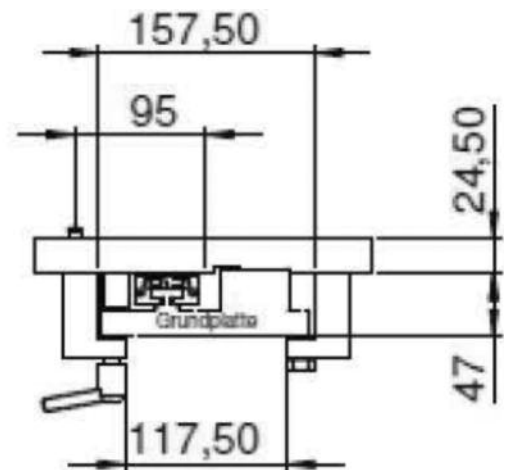
Subject to technical modifications.

Side-tracking clamp plates			
Order No.	Width (mm)	Remark	Weight (kg)
818-060x150	60		3,5
818-100x150	100		5
821-060x150	60	with guide carriage	4,4
821-100x150	100	with guide carriage	6,2

Side-tracking clamp plate

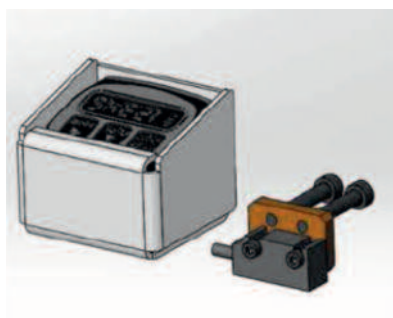
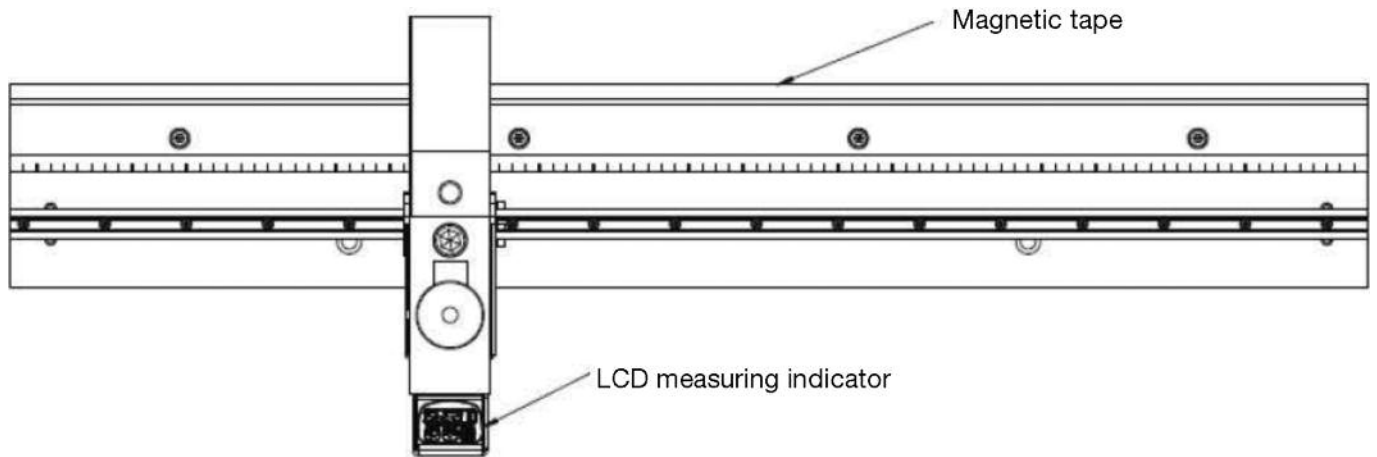


Side-tracking clamp plate with linear guide carriage



FORMING

Digital display with sensor for a punching unit

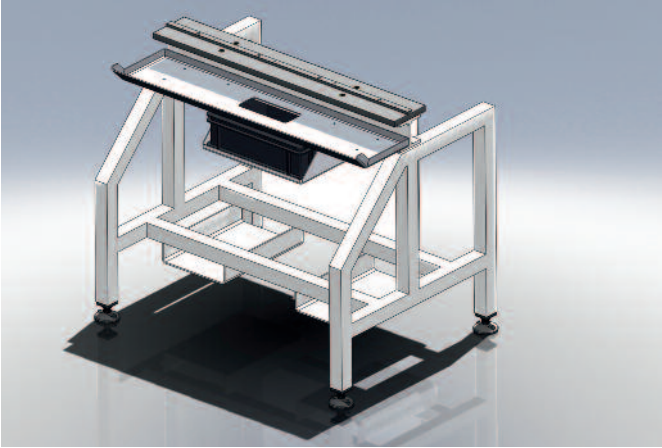


Digital display with sensor	
Order No.	Remark
823-001-000	Digital display with battery, sensor and add-on components for side-tracking clamp plate, measuring accuracy: ± 0.1 mm

Subject to technical modifications.

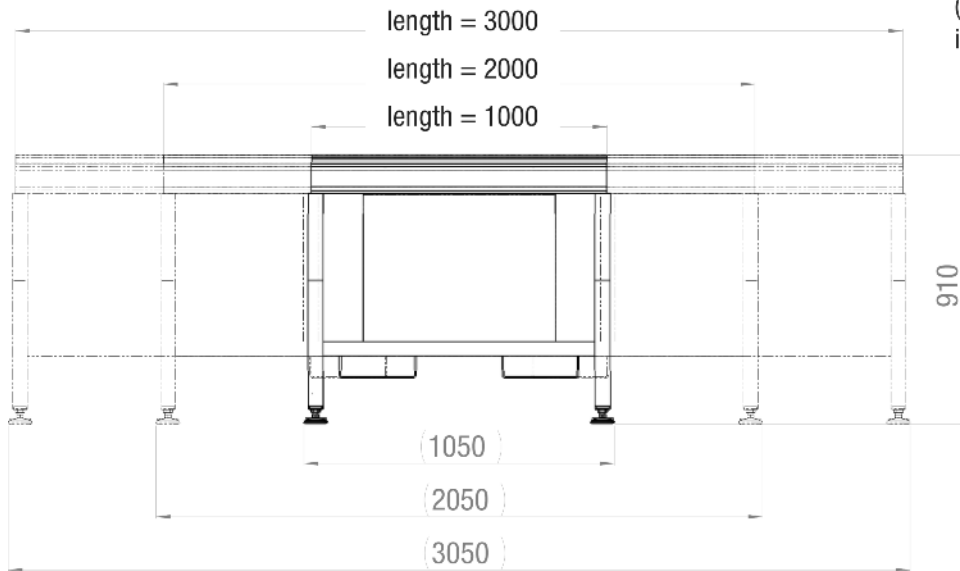


Frames

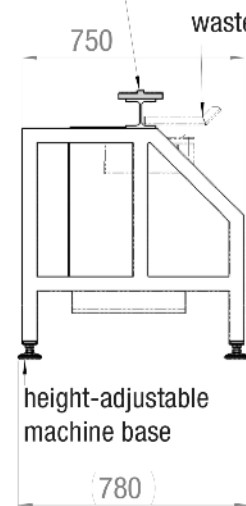


frame with waste collection
order no. 820-X000-002

FORMING



base plate
(order no. 820-150x...)
is included in the scope of supply



RAL no. 7035, light grey

Subject to technical modifications.



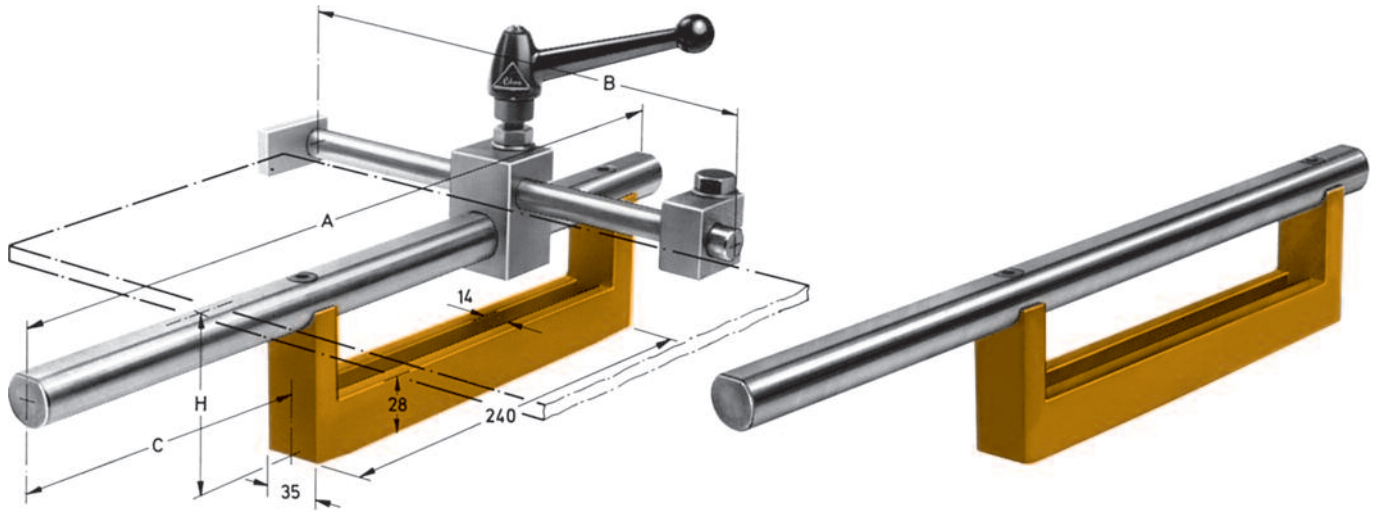
FORMING

Unit for punching aluminium profiles

Standard frame with waste trap, without base plate		
Order No.	Length	Weight
820-1000-002	1000	110
820-2000-002	2000	155
820-3000-002	3000	190

Subject to technical modifications.

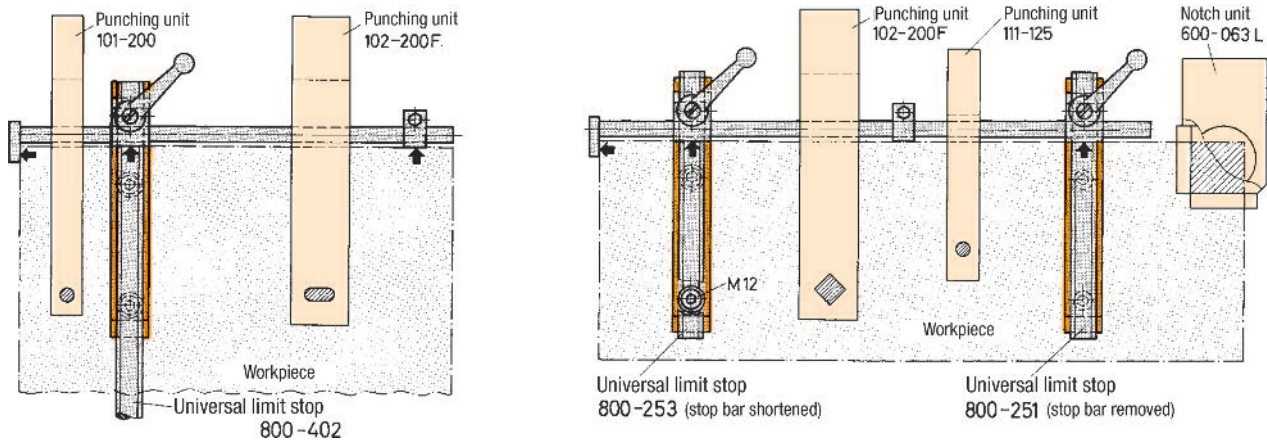
Universal limit stop and workpiece support



Universal limit stop

Workpiece support

Application examples



FORMING

Support height H = 85 mm		Support height H = 125 mm		A	B	C
Workpiece limit stop Order No.	Workpiece support Order No.	Workpiece limit stop Order No.	Workpiece support Order No.			
800-251-085	810-250-085	800-251-125	810-250-125	250	250	5
800-252-085	-	800-252-125	-	250	400	5
800-253-085	-	800-253-125	-	250	630	5
800-401-085	810-400-085	800-401-125	810-400-125	400	250	135
800-402-085	-	800-402-125	-	400	400	135
800-403-085	-	800-403-125	-	400	630	135
800-631-085	810-630-085	800-631-125	810-630-125	630	250	255
800-632-085	-	800-632-125	-	630	400	255
800-633-085	-	800-633-125	-	630	630	255

Subject to technical modifications.

Coordinate limit stop



Order No. **813-200x300**
(also available laterally reversed)

Suitable for all pneumatic and hydraulic punching units with a material support height of 125 mm. For press-operated punching units with a material support height of 85 mm, a height compensation plate is required (order no. **815-200x300**).

With the coordinate limit stops the desired distance between workpiece holes can be adjusted easily and quickly. Time consuming set up with conventional limit stops is unnecessary.

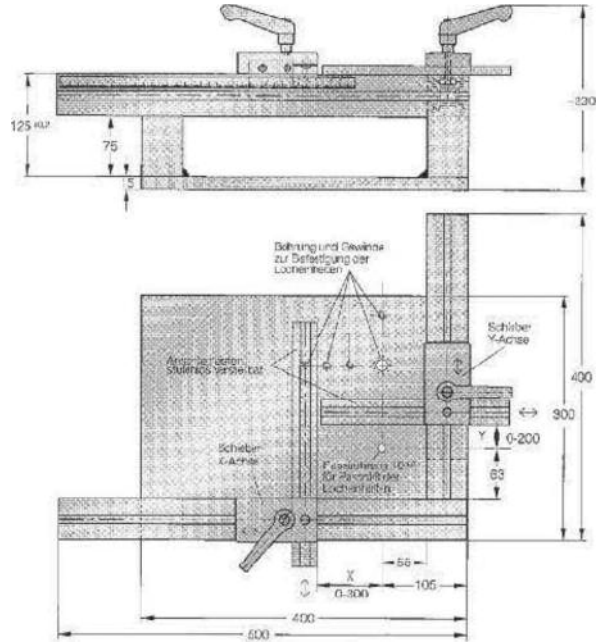
Working range or adjustment possibilities:

x-axis: 0–300 mm

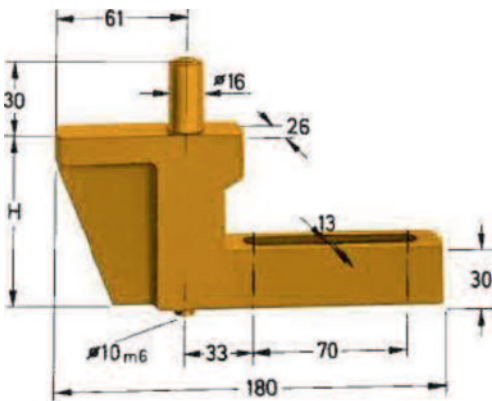
y-axis: 0–200 mm

Additional coordinate limit stops with other working ranges are available on request.

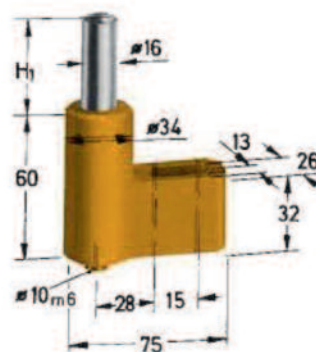
Dimensions: 400 x 500 x 230 mm



Workpiece limit stop

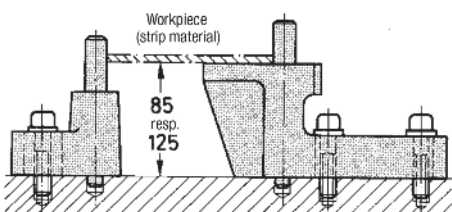


Workpiece limit stop with support





Workpiece limit stop

Application example



Subject to technical modifications.

H	H ₁	 Workpiece limit stop with support Order No.	 Workpiece limit stop Order No.
85	–	800-01-085	–
–	40	–	800-02-085
125	–	800-01-125	–
–	80	–	800-02-125

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