

INTELLIGENT PUNCHING SOLUTIONS

System extensions //

6

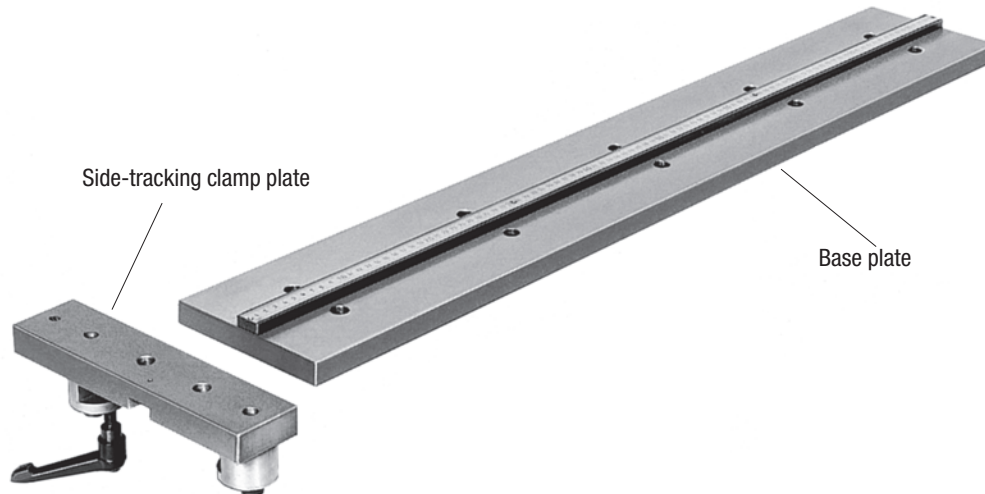
## System extensions //

- // frames
- // limit stop systems
- // hydraulic units
- // hydraulic cylinders
- // pneumatic power cylinders
- // hydropneumatic power cylinders
- // cylinder position monitoring device
- // foot switches
- // minimum quantity lubrication systems

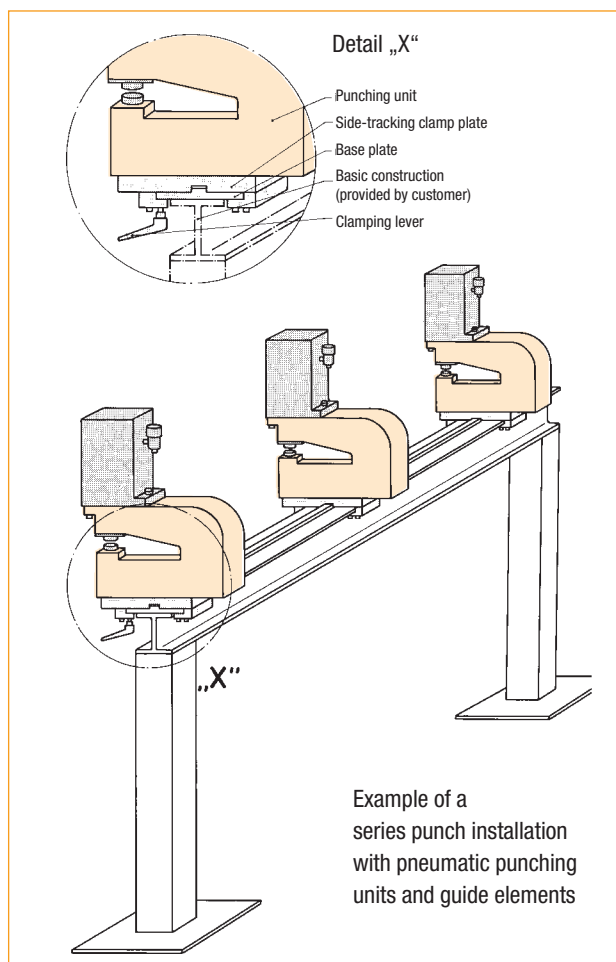
### **Machine control system**

- // safety PLCs
- // quality assurance
- // power monitoring
- // visual inspection
- // insertion monitoring
- // measuring equipment





## Application example



These guide elements provide a simple and cost effective side-tracking 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 side-tracking clamp plate and therefore the punching unit.

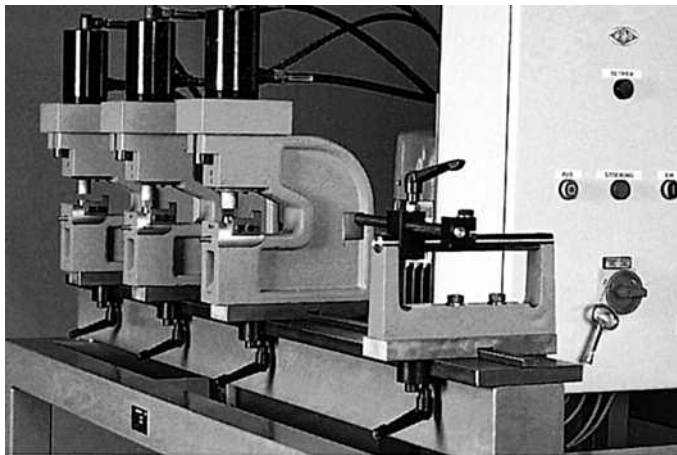
The quick-action clamping lever enables the side-tracking clamp plate to be secured in the desired position on the base plate.

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.

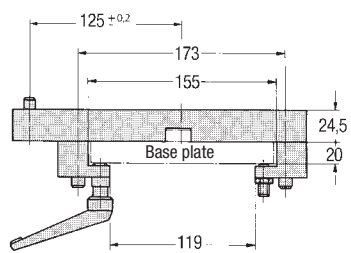
Side-tracking clamp plates		
Order No.	Width [mm]	Weight ~ [kg]
818-060x150	60	3.5
818-100x150	100	5

Base plates			
Order No. without scale	Order No. with scale	Please add the requested total length to the order no. [mm]	Weight ~ [kg]
820-150x...	820-150x...M	1000	24
		1500	35
		2000	47
		2500	59
		3000	71

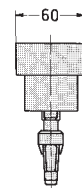


Guide elements in a series punch installation with hydraulic double-action operation for punching a punch layout in steel strips.

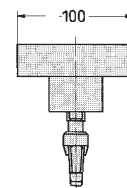
### Side-tracking clamp plate



Side view



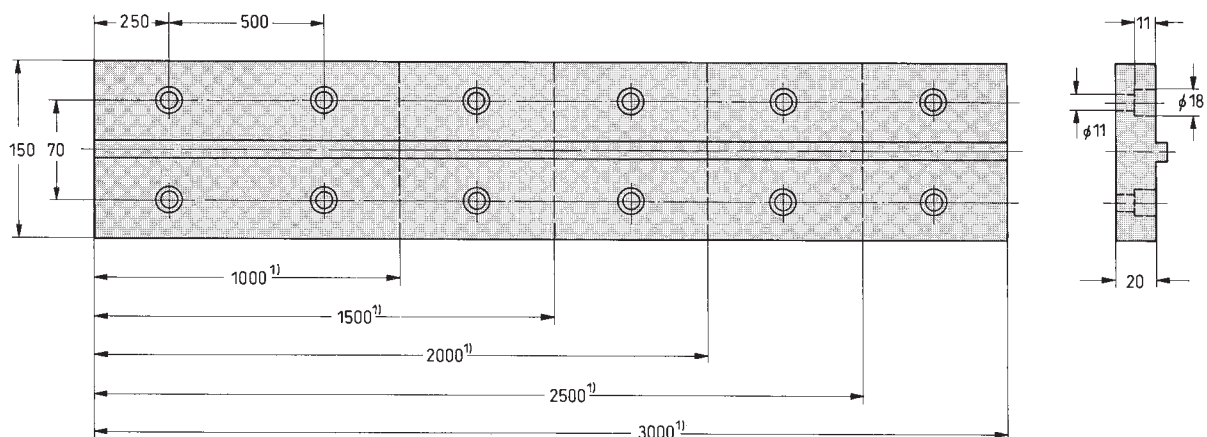
Side view



Order No. **818-060x150**

Order No. **818-100x150**

### Base plate



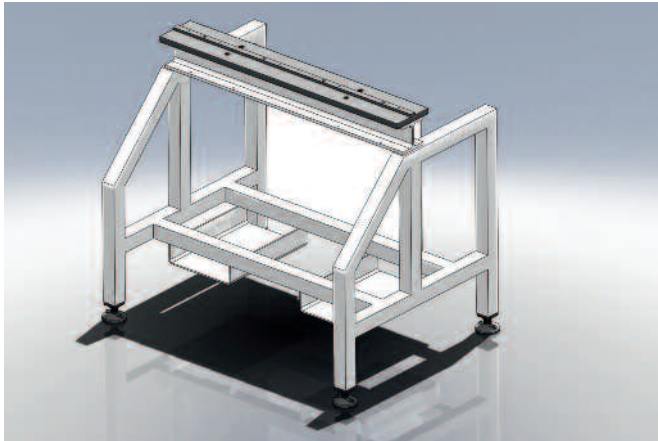
Base plate

Order No. **820-150 x total length**

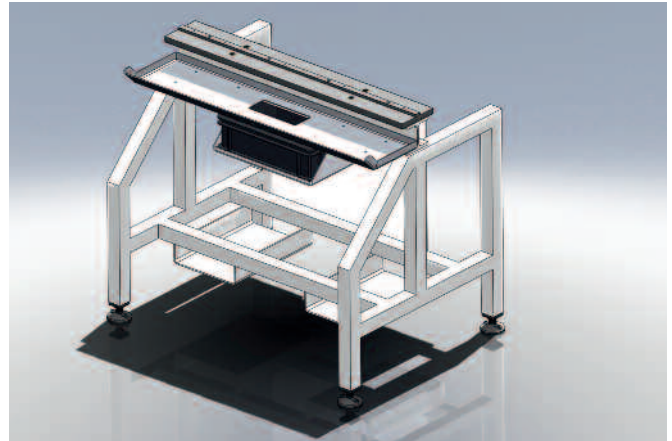
Base plate with scale

Order No. **820-150 x total length-M**

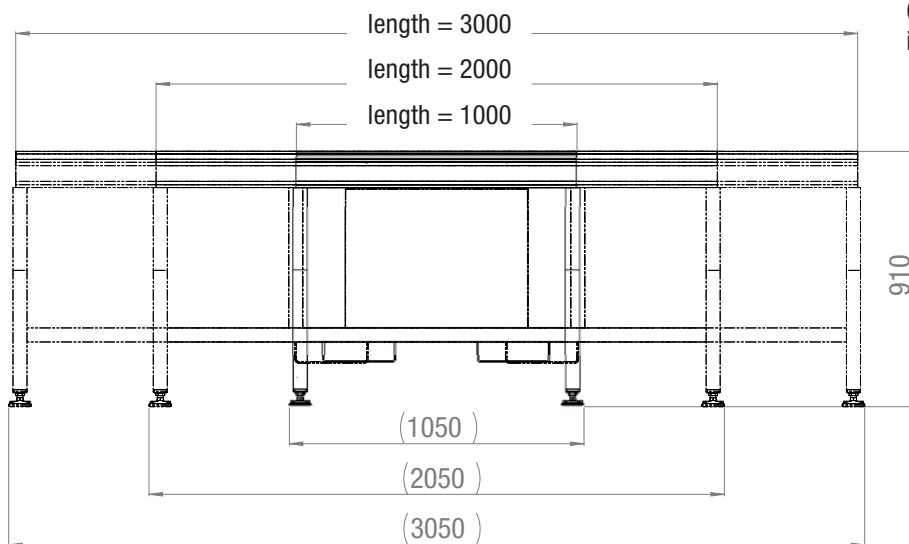
<sup>1)</sup>Total length which can be supplied.



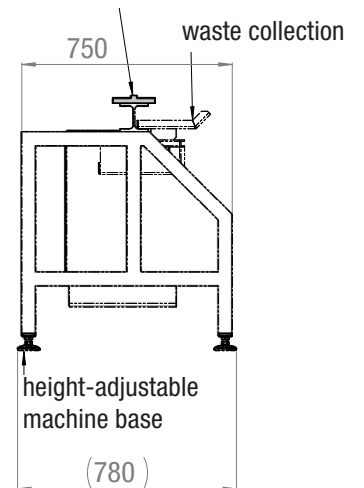
frame  
without waste collection  
order no. 820-X000-001



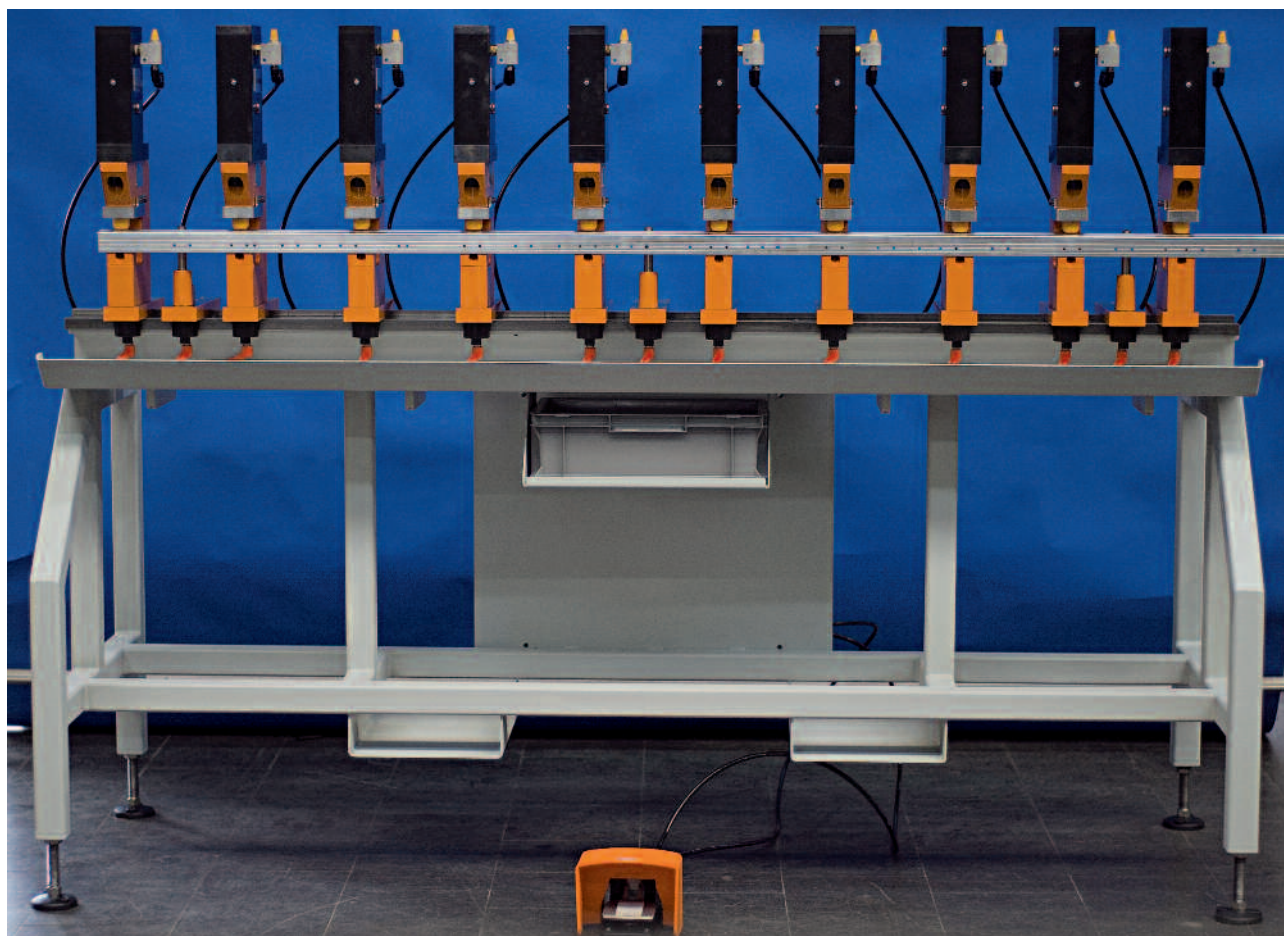
frame  
with waste collection  
order no. 820-X000-002



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



RAL no. 7035, light grey

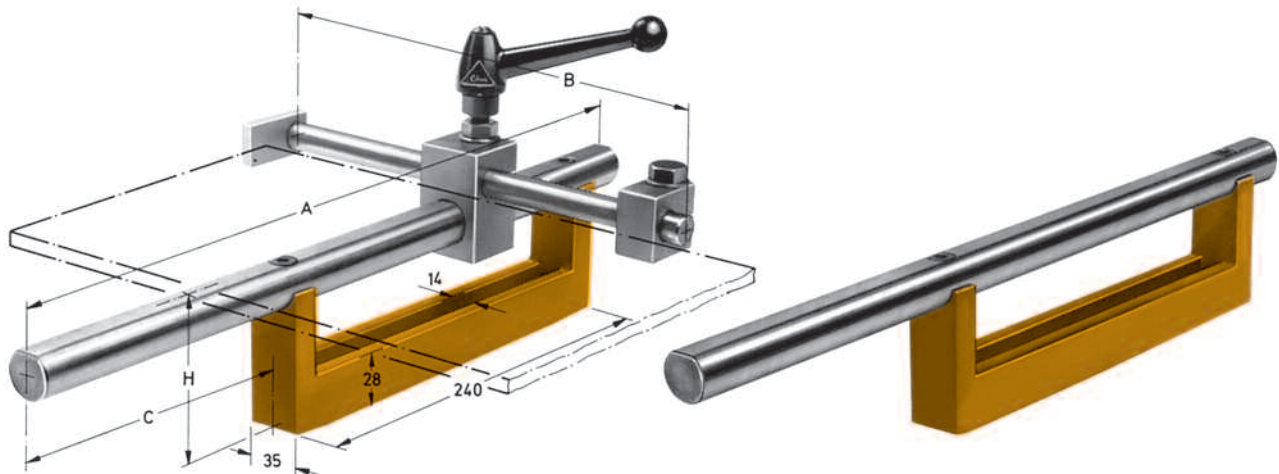


Unit for punching aluminium profiles



Standard frame without waste collection order no.	Standard frame with waste collection order no.	Waste collection order no.	Length:	Weight [kg] without / with waste collection
820-1000-001	820-1000-002	820-1000-101	1000	102   115
820-2000-001	820-2000-002	820-2000-101	2000	146   166
820-3000-001	820-3000-002	820-3000-101	3000	182   208

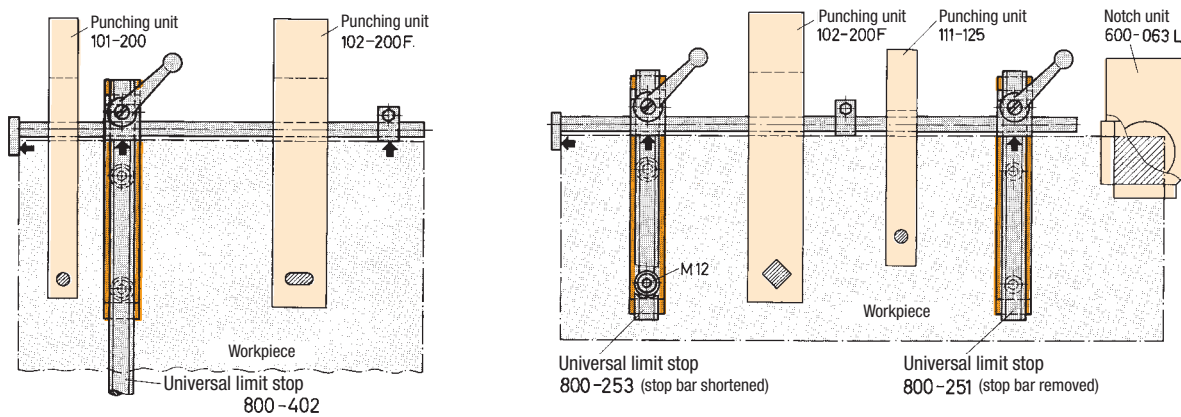
## Universal limit stop and workpiece support



Universal limit stop

Workpiece support

### Application examples



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

## 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.

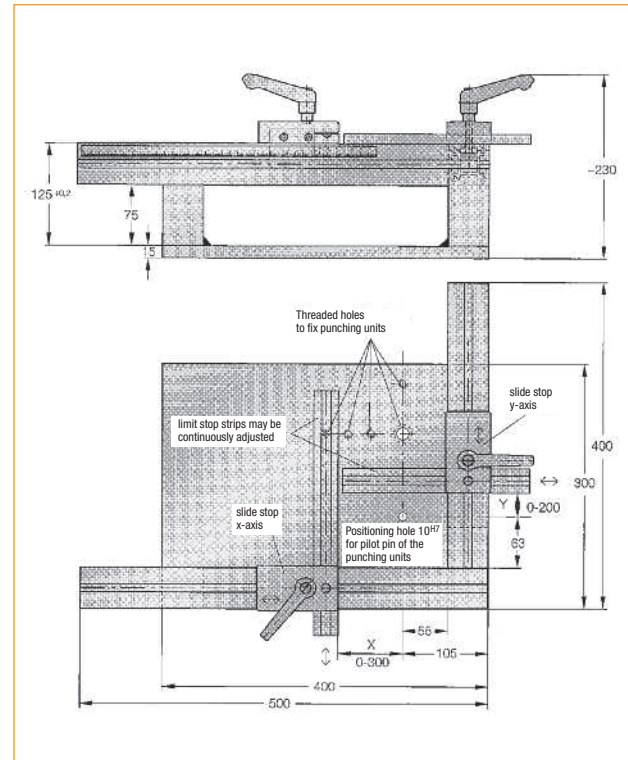
For press-operated punching units with a material support height of 85 mm, a height compensation plate is required (order no. **815-200x300**).

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

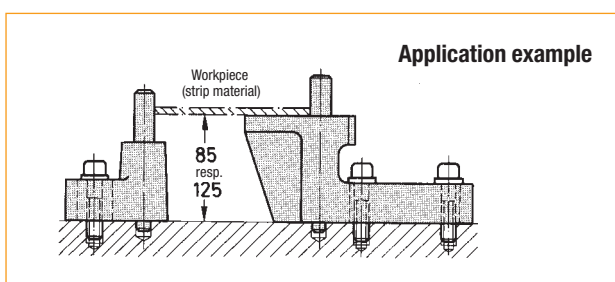
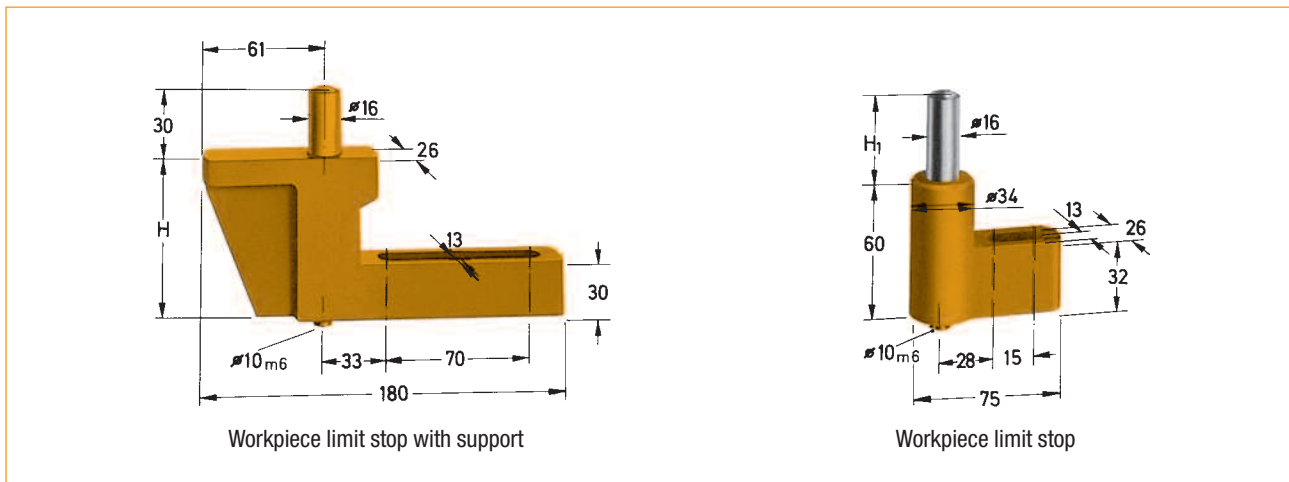


Additional coordinate limit stops

with other working ranges are available on request.

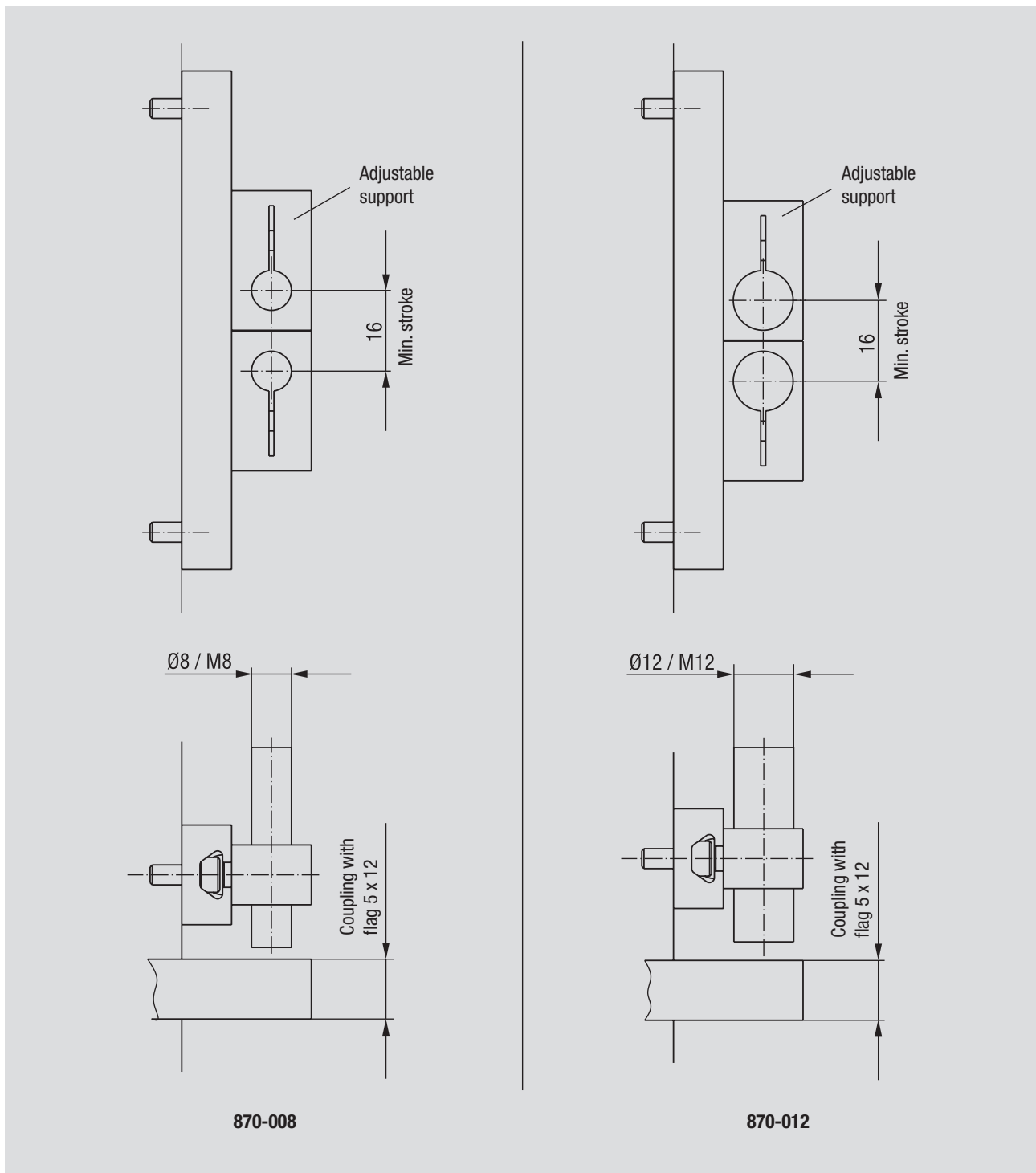
Dimensions: 400 x 500 x 230 mm

## Workpiece limit stop



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





On request, the punching units of series 141-144 and 161-164 can be equipped for cylinder position query. The query is completed at a coupling flag. Inductive sensors with diameters of 8 or 12 may be used alternatively (not included in the delivery).

Order No.	Sensor-Ø
<b>870-008</b>	Ø8 / M8
<b>870-012</b>	Ø12 / M12

**pneumatic features:**

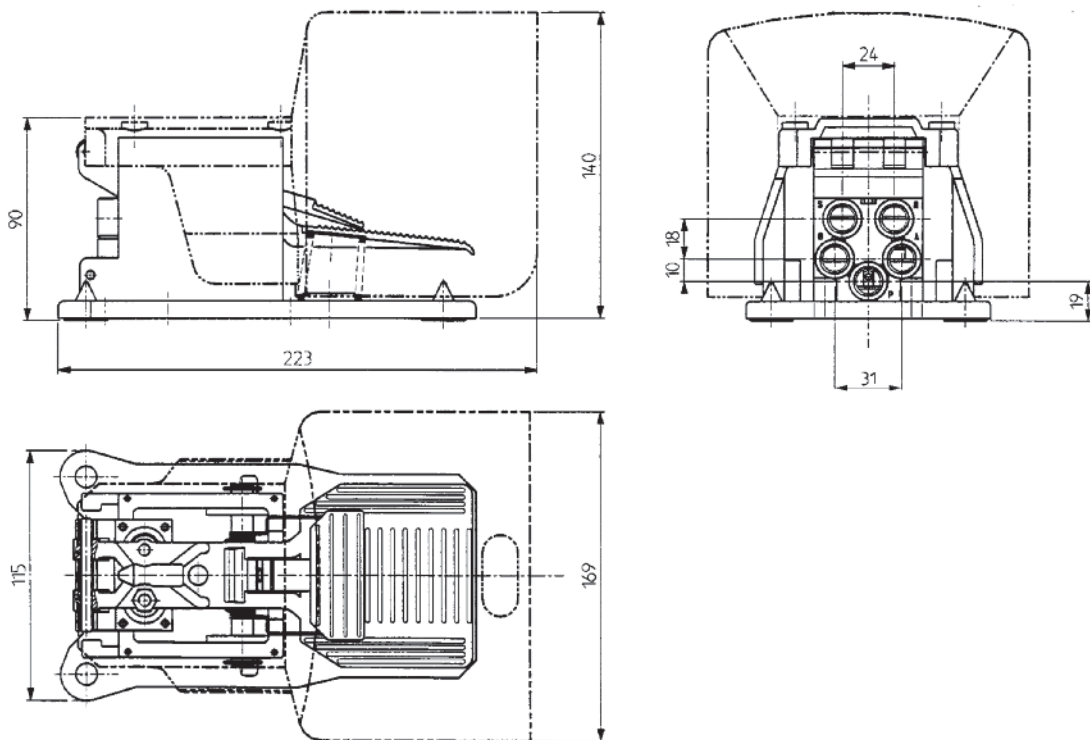
max. working pressure: 10 bar  
 ambient temperature: from -10 °C to 70 °C  
 medium temperature: from -10 °C to 50 °C  
 operation with or without lubrication  
 flow rate: 800 NI/min.

**mechanic features:**

housing and protection cap made of nylon  
 reinforcing web made of steel  
 Zamak diecast valve housing  
 gaskets and washers made of oil- and wear-resistant materials



Pneumatisches Pedal	Steuerung	Rückstellung	Ventil	Anschlüsse	ø in mm	Durchfluß NI/min	Betätigungskraft/N	Masse/kg
<b>AM-5000</b> 	Pedal	Feder	3/2NC	G 1/4	6	800	20	1,25
<b>AM-5001</b> 	Pedal	Feder	5/2	G 1/4	6	800	20	1,45



# Pneumatic power cylinder, single-action

The patented pneumatic power cylinders, shown on this page, order numbers 04-1212 to 04-8025, are designed for use with the pneumatic punching, notch and cut-off units.

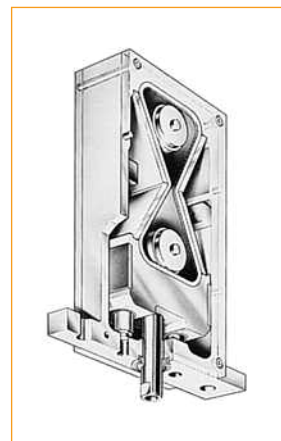
Due to their high tensile strength and their stroke of up to 25 mm, as well as the favourably positioned mounting flange, these elements are suitable for a wide range of operations where high forces are required. The flat and compact design enables series installation.

As illustrated in the sectional view, a pair of toggles is supplied with compressed air via the sleeve positioned behind. The generated force is transmitted directly to the piston rod. The resulting stroke force ratio fulfills all practical requirements for increased stroke accompanied by increased force, see force / stroke chart.

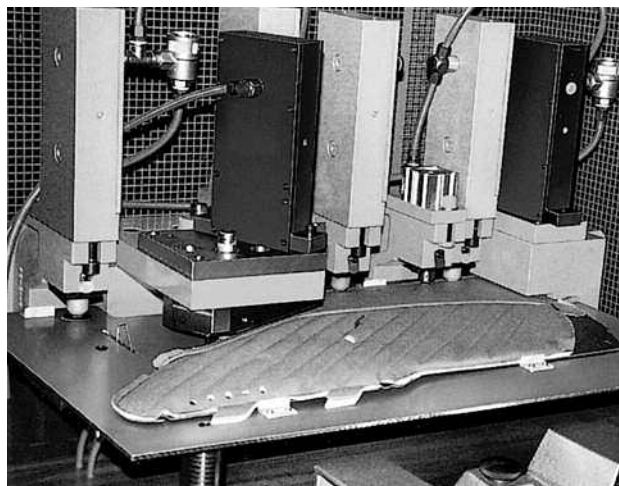
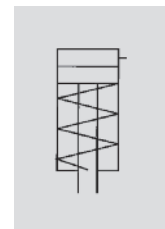
Up to 30 strokes per minute are achieved. For optimum use of the cylinder, i.e. high stroke frequency, the use of quick bleed valves is recommended as the cylinder is a single-action cylinder.

Further applications for these power cylinders are stamping, cold forming, pressing in of sockets and in gluing equipment where parts have to be joined under great pressure.

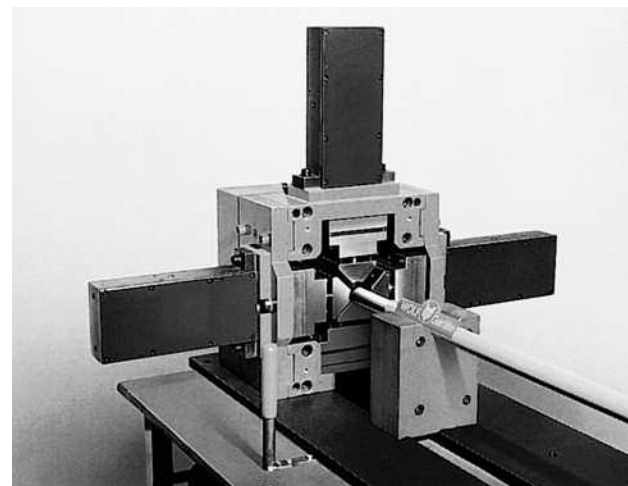
These power cylinders can even be used where high pretensioning forces are needed, e.g. for closing foam moulds or as clamping elements used during leak tests.



Symbol



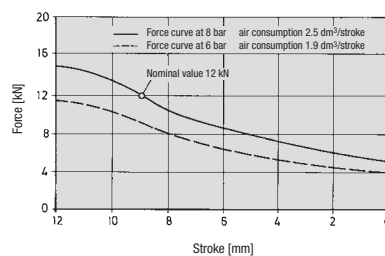
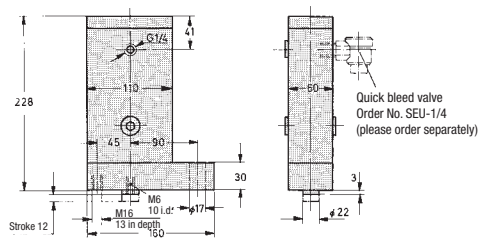
Pneumatic punching unit for punching and notching of pressboard parts covered with leather



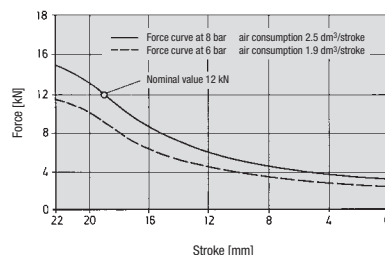
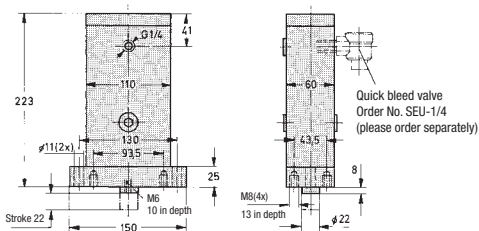
Pneumatic power cylinder for caulking of bushes

Order No.	Nominal force at 8 bar [kN]	Max. force at 8 bar [kN]	Stroke	Working pressure [bar]	Max. stroke frequency [strokes/min.]	Temperature range	Air consumption at 8 bar [dm <sup>3</sup> /Hub]	Weight ~ [kg]
04-1212	12	15	12	2-8	30	- 0°C to +40°C	2.5	4.8
04-1222-1	12	15	22	2-8	30		2.5	4.7
04-1222-2	12	15	22	2-8	30		2.5	4.7
04-2010	20	32	10	2-8	30		3.5	11.0
04-4010	40	50	10	2-8	20		7.2	16.5
04-8013	80	100	13	2-8	15		14.5	39.0
04-8025	80	100	25	2-8	15	14.5	39.0	

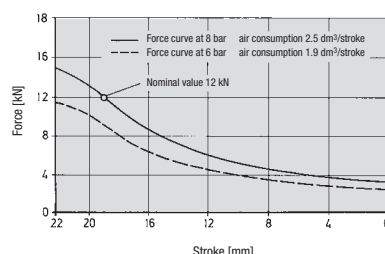
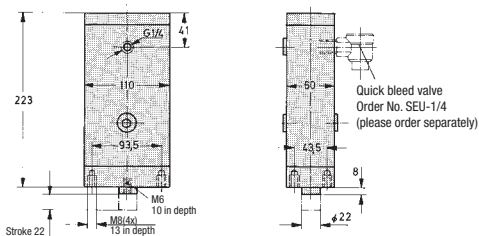
Order No. **04-1212**



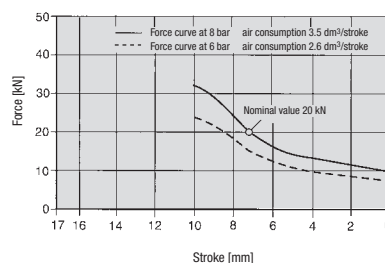
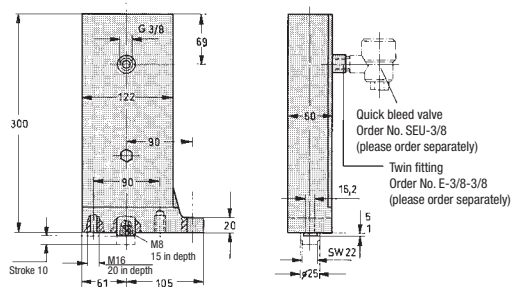
Order No. **04-1222-1**



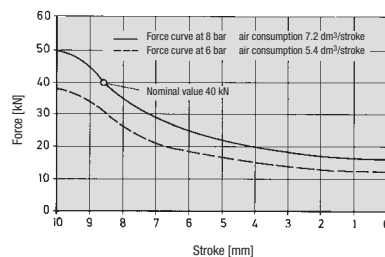
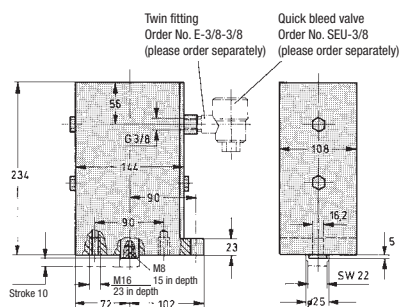
Order No. **04-1222-2**



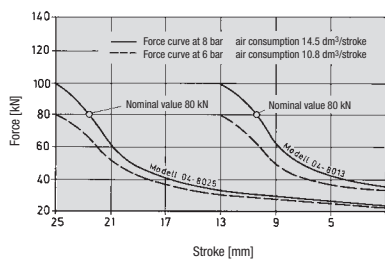
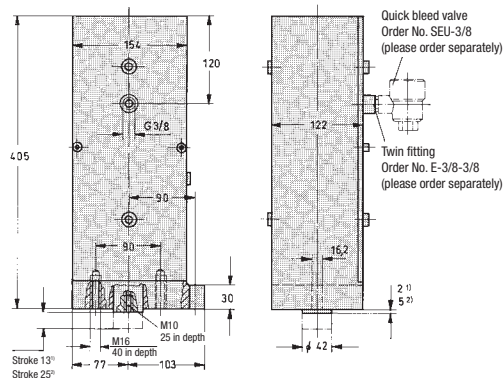
Order No. **04-2010**



Order No. **04-4010**



Order No. **04-8013**  
and **04-8025**



<sup>1</sup>Model 04-8013 <sup>2</sup>Model 04-8025

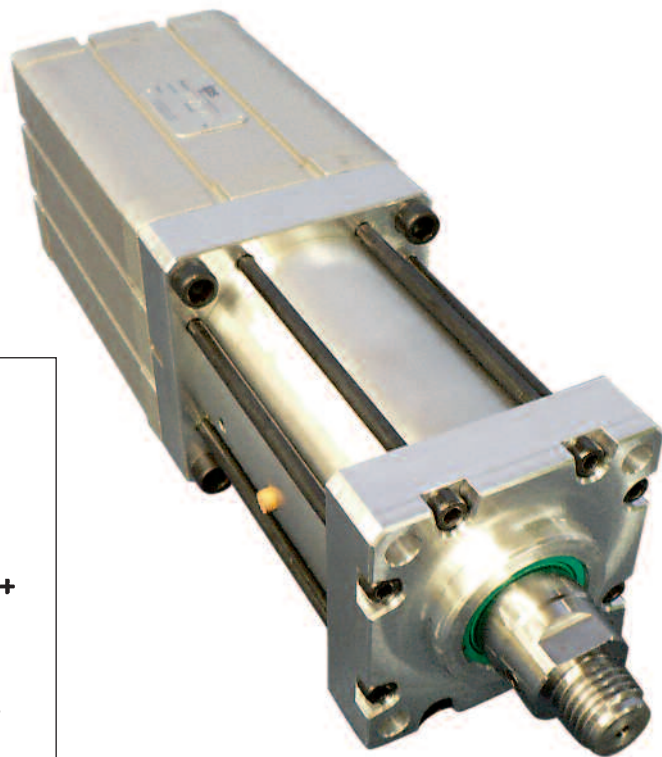
# Hydropneumatic power cylinder, double action

The new power cylinder may be used for many applications, where high forces are required within a small space. Due to the compressed air operation, a hydraulic unit is not necessary. The cylinder provides complete air/oil separation and a modular design. Control is ensured by standard pneumatic valves. The cylinder is easy to maintain and guarantees a low-noise operation. The force curve during the complete stroke is linear.

The excellent price/performance ratio of these cylinders makes them very attractive for use in fixture and special machine engineering.

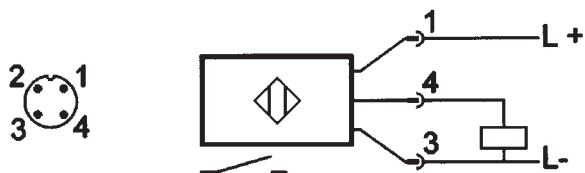
Please note the high restoring force.

The power cylinder can be mounted from »above« and from »below« by means of the four through holes ( $\varnothing 13.5$ ).

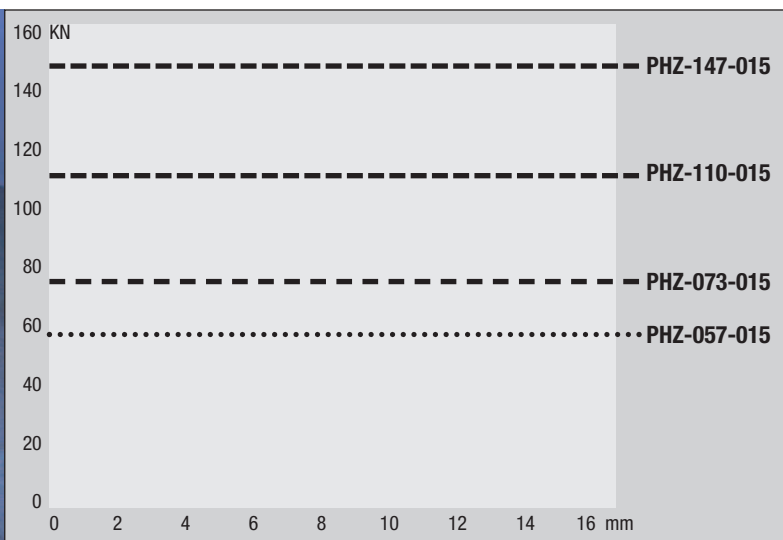
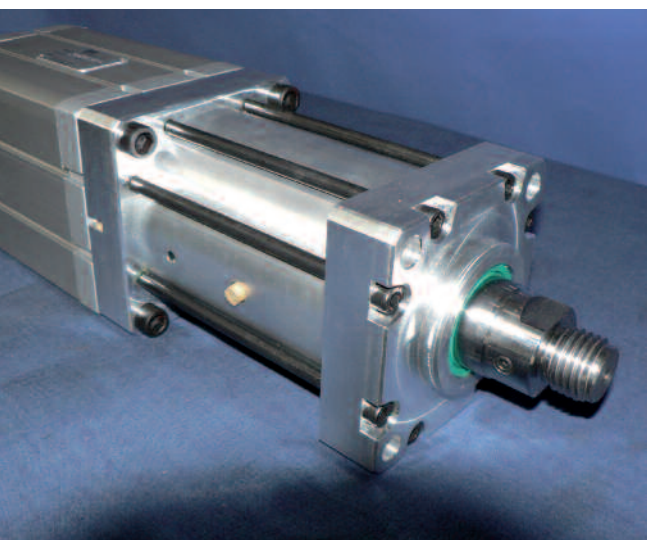


Optional cylinder position query by means of a cylinder switch (PNP, NO contact, M12 plug, 4 poles)  
Order number: E999-0001-0000

Pin configuration and circuit, see drawing:

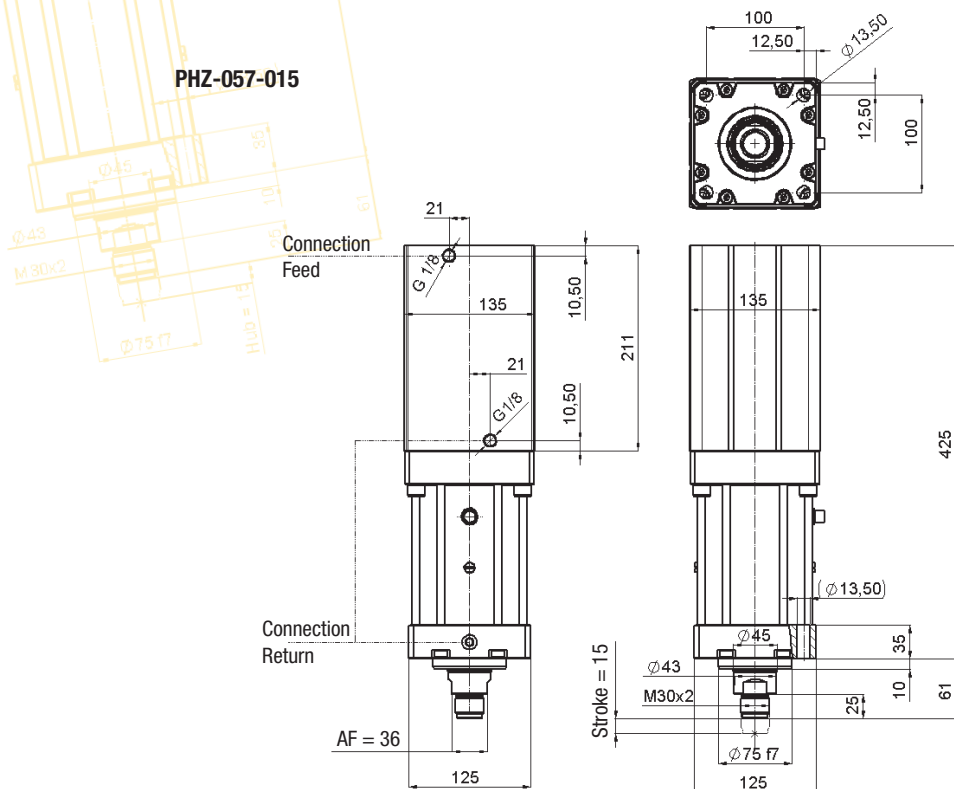


Order no.	Nominal force at 6 bar (kN)	Restoring force at 6 bar (kN)	Stroke = power stroke in mm	Max. stroke frequency (strokes/min.)	Temperature range	Air consumption at 6 bar (dm <sup>3</sup> /stroke)	Weight (kg)
PHZ-057-015	57	3.5	15	60	from 0°C to +40°C	22.2	18.5
PHZ-073-015	73	3.5	15	60		28.2	22
PHZ-110-015	110	3.5	15	60		42	25
PHZ-147-015	147	3.5	15	60		56	28



# Hydropneumatic power cylinder, double action

PHZ-057-015

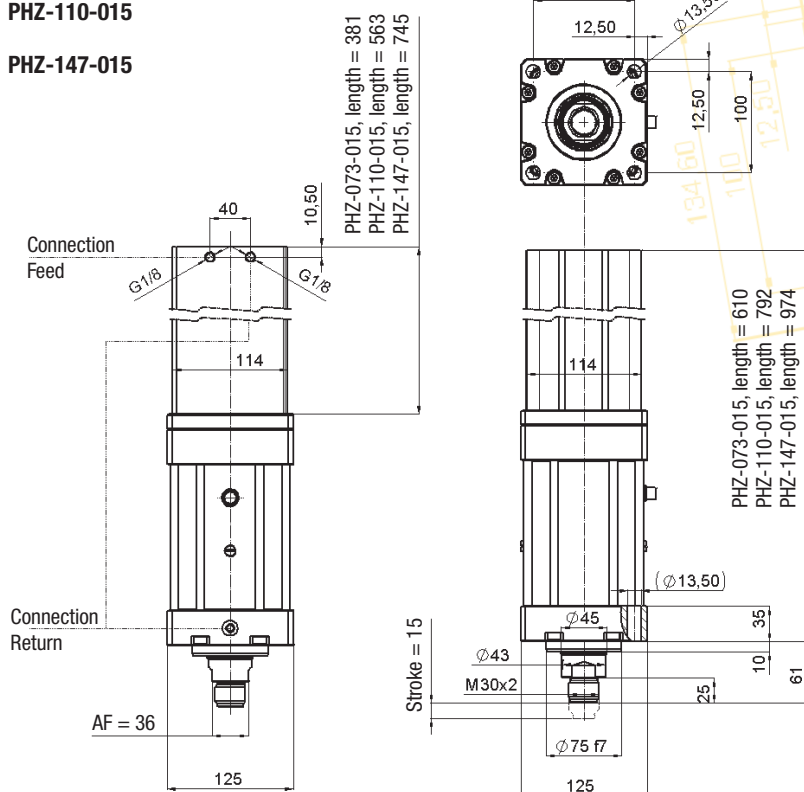


Pneumohydraulic cylinder  
57 kN  
Order no.: PHZ-057-015  
Connection: G 1/8  
Working pressure: 6 bar

PHZ-073-015

PHZ-110-015

PHZ-147-015



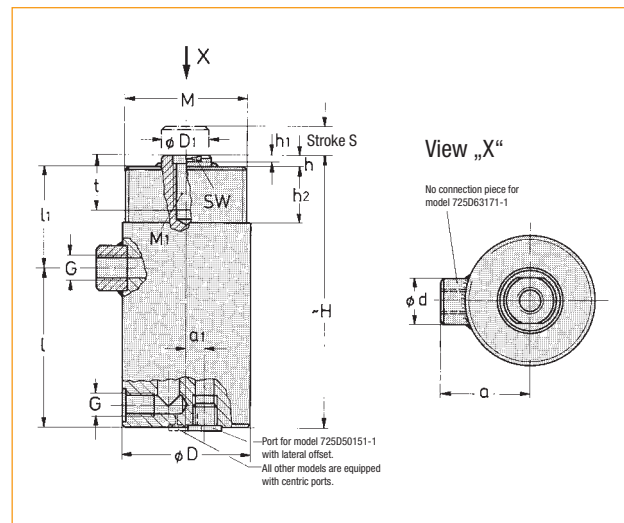
Pneumohydraulic cylinder  
Order no.: PHZ-073-015 = 73 kN  
PHZ-110-015 = 110 kN  
PHZ-147-015 = 147 kN  
Connection: G 1/8  
Working pressure: 6 bar

# Hydraulic short-stroke cylinder, double-action

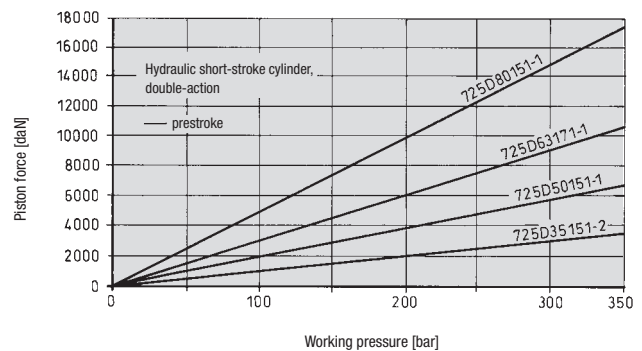
These hydraulic short-stroke cylinders are only used to operate hydraulic double-action punching, notch and cut-off units. They may be interchanged between the individual hydraulic punching units using a mounting flange. Suitable mounting flanges are available on request.

### Technical features:

- Solid construction.
- Optimum piston rod guide: hardened piston rod for protection against corrosion and wear, as well as for improved gliding.
- Honed cylinder tubes.
- Slide surfaces for lip seal and piston rod are finely ground and polished to extend the service life and improve the functionality of the seals.
- All seals have standard dimensions.
- Lateral oil ports, plus the prestroke port on the cylinder bottom
- Model 725D80151-1 is equipped with G3/8 oil ports.



Hydraulic short-stroke cylinder to operate punching units as series punch installation.



Order No.	Piston force at 100 bar		Piston force, comparable with old Order No.	Piston Ø [mm]	Max. stroke S [mm]	Max. working pressure [bar]	Piston surface		Oil consumption/stroke		Port G	Weight ~ [kg]
	Prestroke [daN]	Return stroke [daN]					Prestroke [cm²]	Return stroke [cm²]	Prestroke [cm³]	Return stroke [cm³]		
725D35151-2	962	647	7112	35	15	350	9.62	6.47	14.4	9.7	G1/4	1.9
725D50151-1	1963	1472	7100	50	15	350	19.63	14.72	29.5	22.1	G1/4	3
725D63171-1	3117	2267	7111	63	17	350	31.17	23.13	53	39.3	G1/4	4.5
725D80151-1	5026	3769	7113	80	15	350	50.26	37.69	75.4	56.6	G3/8	10

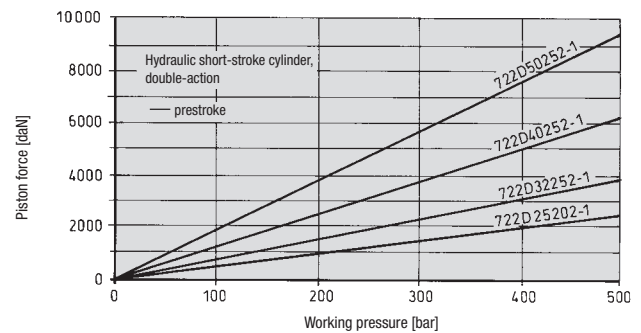
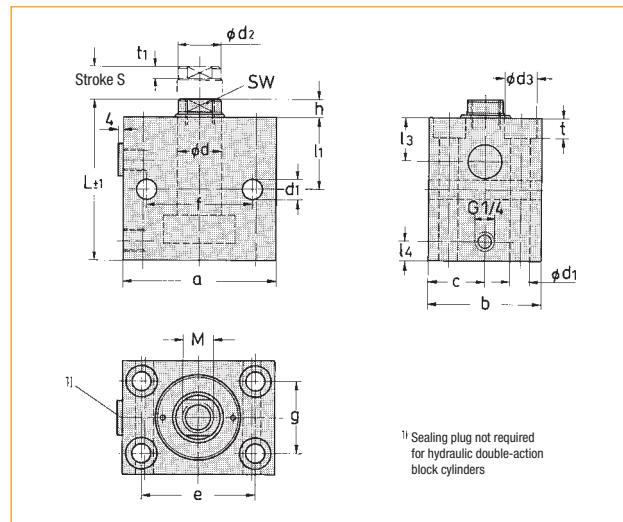
Order No.	a	a'	Ød	ØD	ØD <sub>1</sub>	h	h <sub>1</sub>	h <sub>2</sub>	~H	l	l <sub>1</sub>	M	M <sub>1</sub>	SW	t <sub>1</sub>
725D35151-2	40	–	25	50	20	9	7	30	159	98	52	M48x1.5	M10	17	25
725D50151-1	47	9.5	25	65	25	6	7	30	145	85	54	M64x1.5	M12	20	30
725D63171-1	–	–	–	97	32	9	7	32	150	96	45	M80x2	M16	27	30
725D80151-1	65	–	28	105	40	9	7	29.5	183.5	102	72.5	M80x2	M16	36	31

# Hydraulic block cylinder, double-action

These hydraulic double-action block cylinders are designed for use with hydraulic tool units of series 161 and 666. Their block design makes them suitable for a wide range of applications, such as clamping, pressing, aligning and straightening.

### Technical features:

- Lateral hydraulic connections
- Spring retraction
- Slide ring seal with extended service life
- No stick-slip effect
- Hardened piston rod
- High resistance to transversal forces through extended piston rod guide.
- Piston rod with internal thread



Order No.	Piston force at 100 bar		Piston force, comparable with old Order No.	Piston Ø [mm]	Max. stroke S [mm]	Max. working pressure [bar]	Piston surface		Oil consumption/stroke		Port G	Weight ~ [kg]
	Prestroke [daN]	Return stroke [daN]					Prestroke [cm²]	Return stroke [cm²]	Prestroke [cm³]	Return stroke [cm³]		
722D25202-1	480	284	7551-1	25	20	500	4.91	2.9	9.82	5.8	G1/4	1.4
722D32252-1	788	480	7552-1	32	25	500	8.04	4.9	20.1	12.25	G1/4	2.0
722D40252-1	1232	751	7553-1	40	25	500	12.56	7.66	31.4	19.15	G1/4	2.8
722D50252-1	1925	1136	7554-1	50	25	500	19.64	11.59	49.1	29	G1/4	5.7

Order No.	a	b	c	Ød	Ød <sub>1</sub>	Ød <sub>2</sub>	Ød <sub>3</sub>	e	f	g	h	L	l <sub>1</sub>	l <sub>3</sub>	l <sub>4</sub>	M x depth	SW	t	t <sub>1</sub>
722D25202-1	65	45	22.5	16	8.5	15	13.5	50	50	30	7	84	46	32	11	M10x15	13	9	5.5
722D32252-1	75	55	27.5	20	10.5	19	18	55	55	35	10	97	50	34	11	M12x18	17	11	7
722D40252-1	85	63	31.5	25	10.5	24	18	63	63	40	10	98	49	33	11	M16x25	21	11	7
722D50252-1	100	75	37.5	32	13	31	20	76	76	45	10	110	54	38	13	M20x30	27	13	8



The compact units are perfectly suitable for continuous use and ensure low-noise operation. They create maximum working pressures between 275 bar and 350 bar. One working cycle is included in the scope of supply. Extensions are possible. Please check which options are appropriate for your particular application.

Special units with higher power, modified working pressures, multiple working cycles and special control circuits are designed according to customer's request. We are pleased to advise you on our solutions.

## Technical data

Item number	12972-0015	12972-004	12972-005	12972-007
Power	1,5kW	4 kW	5,5 kW	7,5 kW
Weight	30 kg	110 kg	130 kg	160 kg
Power supply	240V, 50Hz	400 V, 50 Hz	400 V, 50 Hz	400 V, 50 Hz
Output capacity	4,5 l/min.	7,4 l/min.	9,1 l/min.	14,5 l/min.
Working pressure	275 bar	350 bar	350 bar	350 bar
Pump type	external geared wheel pump	internal geared wheel pump	internal geared wheel pump	internal geared wheel pump
Tank	8 litres special tank	63 litres DIN steel tank	63 litres DIN steel tank	100 litres DIN steel tank
Cooling	without	oil/air heat exchanger	oil/air heat exchanger	oil/air heat exchanger
Filter	20 µm filling and ventilation filter	return filter 10 µm filling and ventilation filter	return filter 10 µm filling and ventilation filter	return filter 10 µm filling and ventilation filter
Filter monitoring	optic	optic	optic	optic
Level monitoring	optic	optic	optic	optic
Temperature monitoring	optic	optic	optic	optic
Acoustic press. level of hydr. pump	75 dB(A)	65 dB (A)	65 dB (A)	65 dB (A)
Theoretical cycle times for 1 cylinder Ø 50 mm / stroke 10 mm	0,9 sec (move out and in)	0,6 sec (move out and in)	0,5 sec (move out and in)	0,3 sec (move out and in)
Valve	4/3-way valve, electric	4/3-way valve, electric	4/3-way valve, electric	4/3-way valve, electric

## Electric control units

The design of the control unit and the safety components can be discussed and checked in the individual case. Some control types are shown on the rear.



### Options:

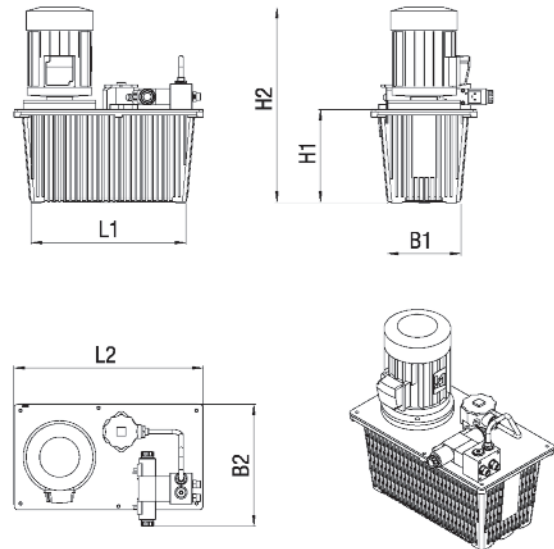
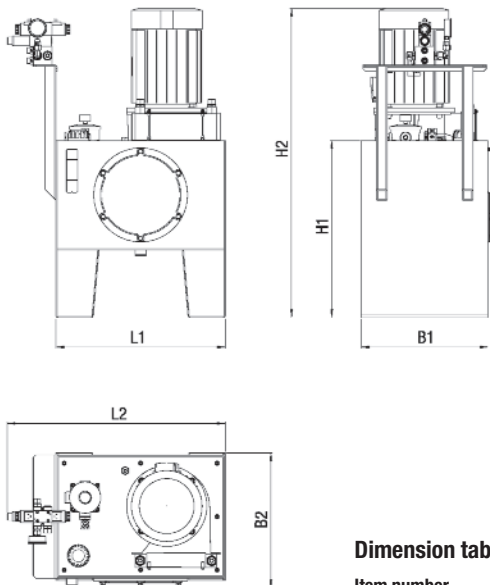
- oil collection container according to Water Resources Act, § 19.1
- electric filter monitoring
- electric level and temperature monitoring (not available for item no. 12972-0015)
- pressure filter
- water cooling
- mechanical or digital pressure switches in the pressure line for monitoring
- mechanical or digital pressure switches in the consumer devices for control
- proportional and servo valves (not available for item no. 12972-0015)
- one-way check valve leading to the different consumer devices
- hydraulic pilot-controlled check valves leading to the different consumer devices

## Hydraulic unit: 12972-004, 12972-005 and 12972-007

Dimension X depends on the control type

## Hydraulic unit: 12972-0015

Dimension X depends on the control type

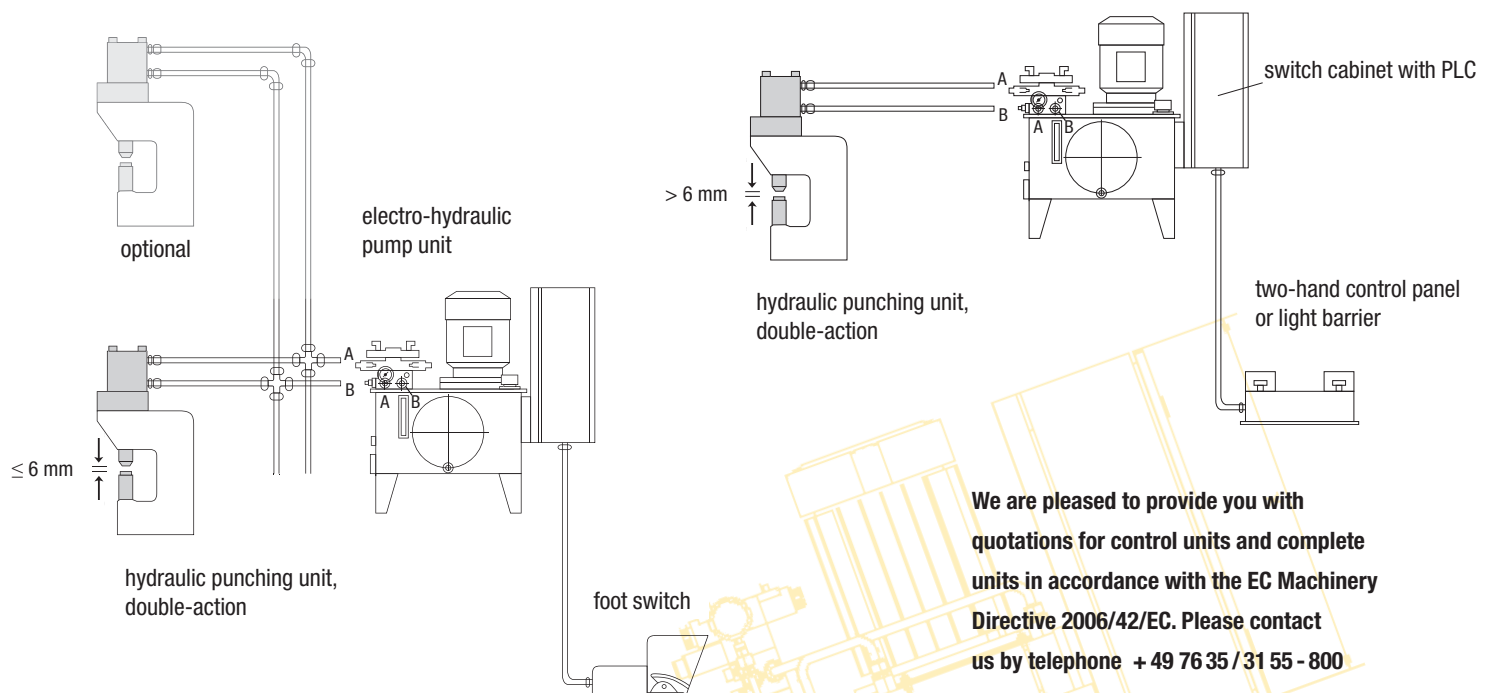


**Dimension table**

Item number	12972-0015	12972-004	12972-005	12972-007
length L1	427	508	508	633
length L2	521	690	690	815
width B1	203	375	375	474
width B2	336	406	406	503
height H1	256	660	660	660
height H2	537	1065	1065	1153

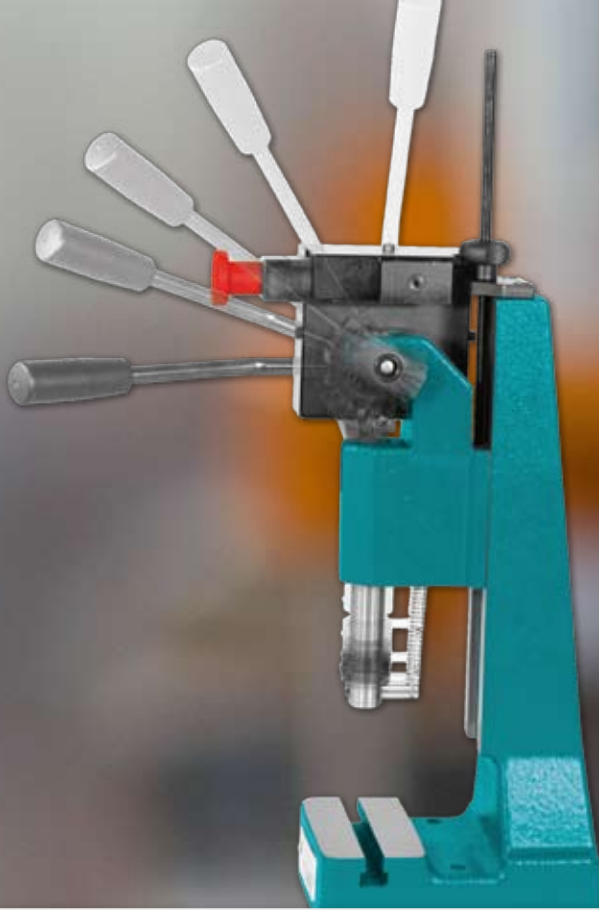
### The following control types are possible:

electro-hydraulic pump unit with press safety valve



We are pleased to provide you with quotations for control units and complete units in accordance with the EC Machinery Directive 2006/42/EC. Please contact us by telephone + 49 76 35 / 31 55 - 800

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**Small Presses //**



**Small Presses //**

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