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Bending

Bending



The manufacturer reserves the right to change the specified values, options and techniques at any time.

The flexible power press concept EHT VarioPress

Top products for the sheet metal working market in the field of die bending presses supplied by EHT. In the market for sheet metal work, the EHT VarioPress stands for flexibility, process safety, and economic efficiency. It is a modular construction system for the requirements you are expected to meet every day in your production.



Performance features

Model	Press force (kN)	Working length (mm)	Stroke (mm)	Distance table/pressure beam (mm)
VP 50	500	1550 – 2050	250 – 550	570 – 870
VP 85	850	1550 – 2550	400 – 700	720 – 1020
VP 130	1300	1550 – 5050	400 – 700	720 – 1020
VP 170	1700	2550 – 6050	400 – 700	720 – 1020
VP 230	2300	2550 – 6550	400 – 700	720 – 1020
VP 300	3000	3050 – 8050	400 – 700	720 – 1020
VP 400	4000	3050 – 9050	400 – 700	720 – 1020
VP 500	5000	3050 – 9050	400 – 700	720 – 1020
VP 600	6000	4050 – 9050	400 – 700	720 – 1020
VP 800	8000	4050 – 9050	400 – 700	720 – 1020
VP 1000	10000	4050 – 9050	400 – 700	720 – 1020

Higher tonnages on request!

CNC controlled crowning

The ultra-precise crowning system is integrated in the table. Easy and automated programming via the CNC control.

Bottom tool displacement

For the automatic positioning of the bottom die system, allowing the use of highly flexible multi-V tools.

quick clamping system for upper and bottom tools

Very short setup times for upper and bottom die. Clamping and releasing via push-buttons. Removal of upper tool to the bottom or to the side.

Bending aids

For large-scale and/or heavy bending parts. For lateral and height movement and programmable as axis. Optional: available individually or in pairs.

Support brackets

For lateral and height positioning. Mounted to guide rail. Angle-exact positioning of the bending parts.

back gauge system

Ultramodern technology and fast drives with AC servo motor. Several versions are available:

- 2 axes (X + R)
- 4 axes (X, R, Z1 + Z2) shift of stop fingers
- 5 axes (X, R, Z1 + Z2, X1) inclination of stop fingers
- 6 axes (X1, R1, Z1, X2, R2, Z2), any stop situation possible in the 3D work space

controls

The current generation of CybeleC.

Angle measuring system

LCB – laser controlled bending. Bilateral measuring, tool-independent, non-contacting. Freely movable over the entire working length, optionally also programmable as NC axis.

Safety Device

Optical laser safety device. State-of-the-art safety level allows fast and safe production.

Material handling



Front support brackets

With the help of guide rails, the support brackets are easily positioned in height and to the sides – for exact and flexible adjustment. Further options: side, micrometer and spring-hinged stop mechanisms. Several models are available for various weight loads.

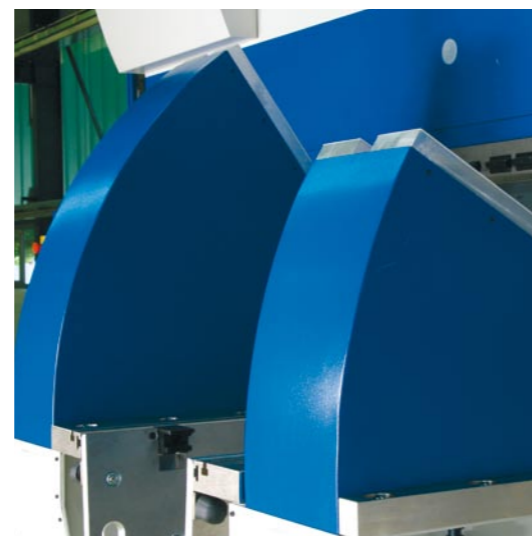
Front/back bending aids

allow the machining of large, thin and unstable bending parts. Being movable sideways and in height as well as being programmable, the bending aids provide optimum support for perfect bending results and allow handling-intensive bending parts to be worked by one operator.

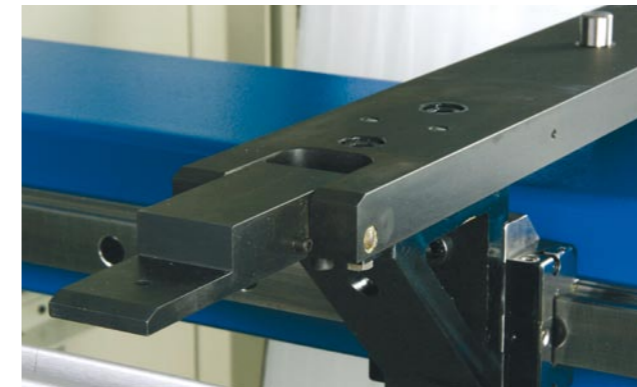


Sheet support rear

The sheet support allows the simple and precise positioning of long and thin bending parts with large and precise stop depth at the rear.



Back gauge systems



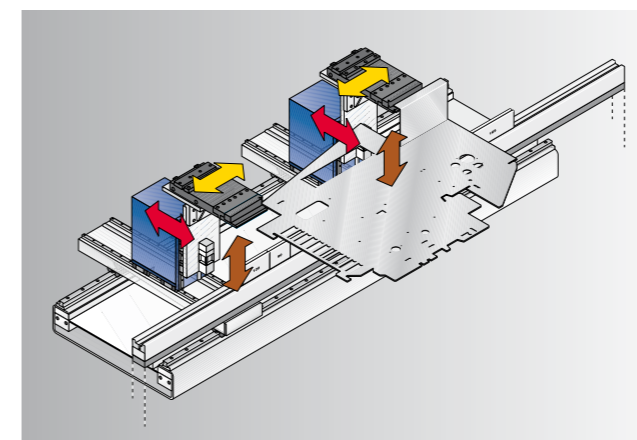
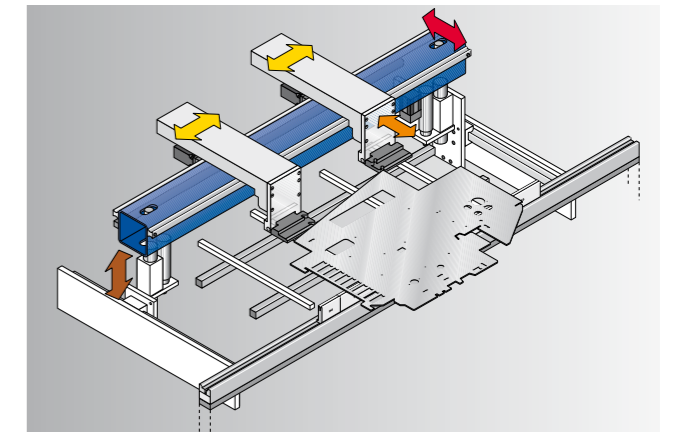
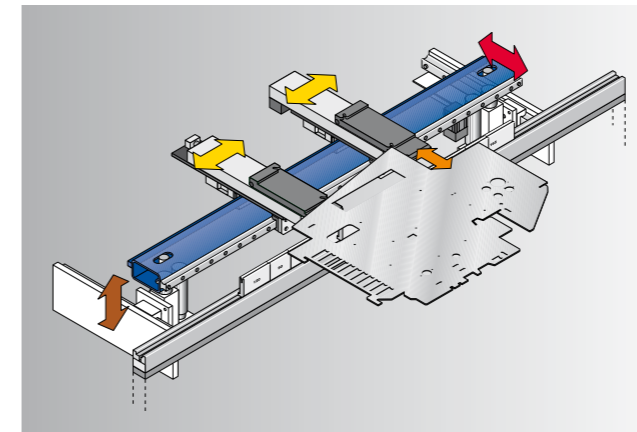
Standard back gauge systems – for positioning in X, R and Z direction.




 X axis
 R axis
 Z1 and Z2 axis
 X1 axis

System I (standard)
2, 4 and 5 axes

 X axis
 R axis
 Z1 and Z2 axis
 X1 axis

System II (for bending aids and sheet support rear)
2, 4 and 5 axes



System III
6 axes
 X1/X2 axis
 R1/R2 axis
 Z1/Z2 axis

Ideal for bending lines running slanted to the stop edge angle. Stop fingers are located on 2 motion control units moving entirely independently of each other. The stop fingers can therefore be positioned at any point of the 3D working length.

Tool system

The intelligent tool concept of the VarioPress stands for maximum flexibility and economic efficiency. Two different bottom die alternatives allow for a tool technology aligned exactly to match your component spectrum.



Simple insertion of upper tool from below without opening the safety latch.

Pneumatic construction Multi-V/Single-V

Installation system of multi-V die plates with pneumatic tool clamping. Single-V die plates (13 mm installation size) can be inserted with additional adapter bar.

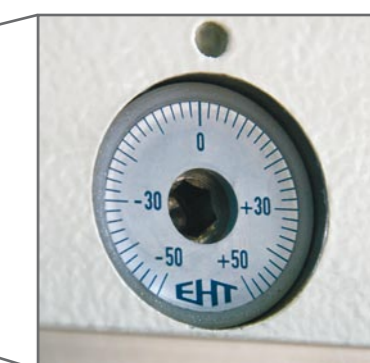
Mechanical construction Multi-V/Single-V

Installation system of block die plates with mechanical tool clamping. Single-V die plates (13 mm installation size) can be inserted without additional adapter bars.

Distinctive technical features of the EHT VarioPress



Selective camber device
Accurate and consistent bending angles can be achieved with this function.

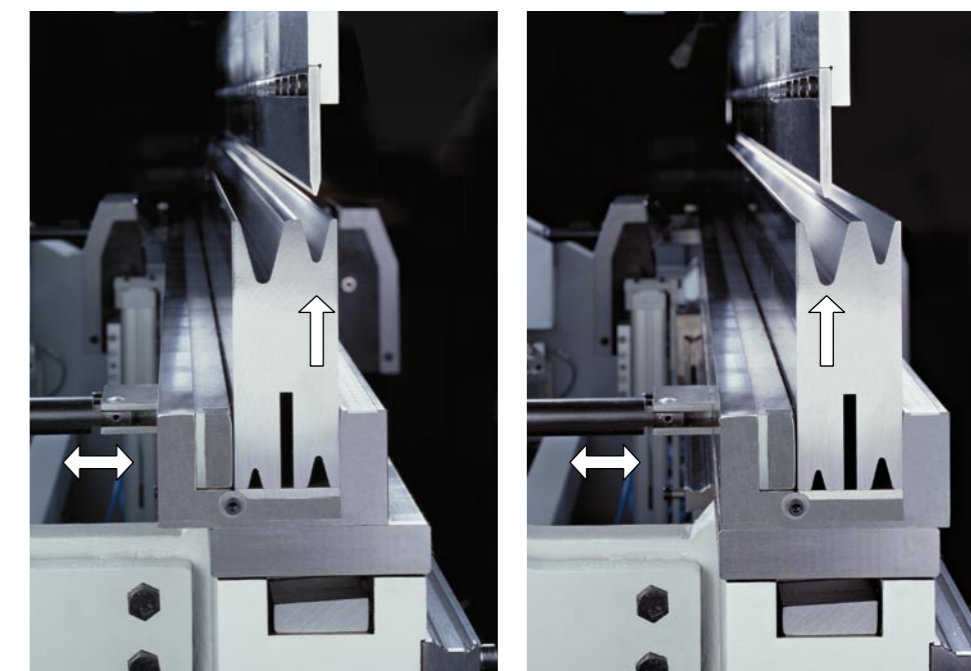


The crowning curve can be adjusted individually every 250 mm.

The newly-designed crowning system device provides the option of balancing tool inaccuracies or tool wear. Even different deformation zones such as blowouts in the bending zone can be readjusted selectively.

Another advantage is the individual adjustment of the camber curve for stationed or eccentric bending.

Bottom die shift in combination with the Multi-V tool has immense advantages, such as the option of pre-bending and creasing without tool exchange. Even the most complicated geometries can be achieved in one go, providing clear time savings. Through CNC-controlled expansion stages of the bottom die shift, even special tools can be integrated effortlessly.



Tailor-made Bending

We build the EHT VarioPress specifically according to your requirements on the basis of an extensive modular construction system. A machine tailored to your needs is simply the best solution, especially when you need to deal with parts of various metal lengths or which require higher press force.



The tandem version of the EHT VarioPress allows you to produce an exceptional variety of part lengths. This solution permits efficient and economic work in all bending lengths.



LCB Laser Controlled Bending

The EHT angle measuring system avoids extensive positioning processes, optimises your bending results effectively and helps reduce scrap parts.

Along with the LCB, we offer a measuring device which meets the increasing cost pressure and quality requirements.

Very recent findings in laser and optoelectronics make for a highly precise, flexible, adaptable and effective device.

Designed as tool-independent unit, LCB can be used for many tool geometries and special tools.



Why angle measuring?

The problem has many facets: differences in material type and stability, direction of rolling, the tolerances of the sheet metal and the influence of the marginal zone. That means that the required Y-way of the press beam as well as the resilience has a significant impact on the bending result.

LCB helps you in the simplest way possible:
 Saving space
 Tool-independent
 Freely shiftable
 Dirt resistant

Controls

Modern sheet metal work also means modern controls and modern software. Windows operating systems, clearly laid out colour screens, 2D/3D simulation, comprehensible and self-explanatory programs, large keys and network capability are standard at EHT.



ModEva 10S

- Rapid data input thanks to the ergonomic, slightly-slanted keyboard with large keys
- Convenient operation thanks to the 10" TFT colour screen
- The numeric control has a 2D offline software for the preparation of the production programs at the PC and for checking the options for processing work pieces in the office
- 2D graphic display for display and multiple simulation
- Multitasking and data management in Windows XP

ModEva 12S

- Rapid data input thanks to the ergonomic, slightly-slanted keyboard with large keys
- Convenient operation thanks to the 12" TFT colour screen
- The numeric control has a 3D offline software for the preparation of the production programs at the PC and for checking the options for machining work pieces in the office
- Very simple and convenient data transfer from most CAD/CAM systems
- 3D graphics display for display and multiple simulation
- Multitasking and data management in Windows XPe



Calculating the bending forces

Bending process in 2 alternatives:

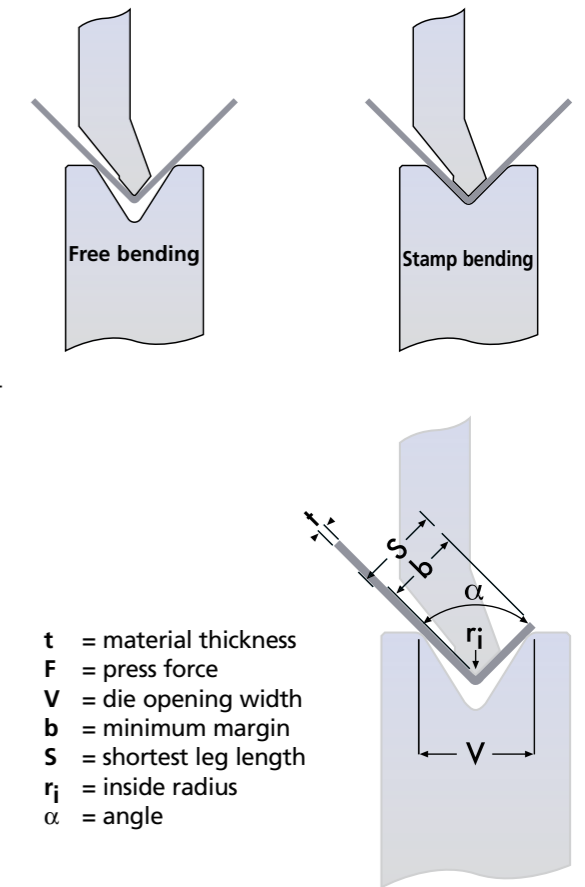
Free bending Stamp bending

The pressure force (F) of stamp bending is 3 to 8 times the force of free bending. The required press force (F) results from the die opening width (V) and the material thickness (t). The die opening width (V) should be 8 to 12 times the size of the material thickness. The bending-off of the shortest side (b) as well as its angle (α) is to be noted for the die opening width (V) used. Using a smaller opening width of the die plates (V) will make the ultimate interior radius (r_i) smaller.

Using the press force index and formulas will allow you to determine the appropriate reference values.

Press force index (press force in t/m – r_i , b, V, t in mm)
Required press force for 90° free bending
Material 450 N/mm²

Inside radius r_i	1,0	1,3	1,7	2,0	2,6	3,3	3,9	4,9	5,3	5,7	6,6	7,4	7,9	9,5	11,2	12,7	14,3	15,9	17,5	19,2	20,7	22,3	23,9	25,6	28,6	31,9	39,9		
Minimum margin b	4	5,5	7	8	10	13	15	19	20	21,5	26	28,5	29	34	39	46	51	56	61	66	73	78	83	88	102	112	137		
Die opening width V	6	8	10	12	16	20	24	30	32	35	40	45	50	60	70	80	90	100	110	120	130	140	150	160	180	200			
Material thickness t	Required press force F in t/m																												
1,0	13	8	6																										
1,2	19	13	10	8																									
1,5		22	16	13	17																								
2,0			32	25	18	13																							
3,0						32	25	19																					
4,0						65	50	37	34	30	25																		
5,0								63	57	51	42	36	32																
6,0								97	89	78	65	55	48	38															
7,0										113	94	79	69	54	44														
8,0											130	110	94	74	60	50													
9,0												146	125	97	79	66	57												
10,0													162	125	101	84	72	63											
11,0														157	127	105	90	78	69										
12,0															194	156	130	110	96	85	76								
13,0																189	157	133	116	102	91	82							
14,0																227	187	159	138	121	108	97	88						
15,0																	221	188	162	142	127	114	103	95					
16,0																	259	219	189	166	147	132	120	110	101				
18,0																		292	251	219	194	174	158	144	132	113			
20,0																			324	283	250	224	202	184	169	144	126		
25,0																					383	344	313	286	243	211	158		
30,0																							486	443	375	324	240		



t = material thickness
F = press force
V = die opening width
b = minimum margin
S = shortest leg length
 r_i = inside radius
 α = angle

Example:

Material thickness	t = 4.0 mm
Optimum die opening width	V = 32.0 mm
Minimum margin	b = 20.0 mm
Shortest leg length	S = 24.0 mm
Inside radius	r_i = 5.3 mm
Required press force	F = 34.0 t/m

Determining the die opening width V in mm:

Material thickness t in mm	0.5 – 8.0	9.0 – 10.0	12.0 und mehr
Die opening width V	8 x t	10 x t	12 x t

Determining the shortest leg length S in mm:

$$S = b + t$$

Tensile strengths:

Aluminium	$R_m = 200-300 \text{ N/mm}^2$
Steel	$R_m = 370-450 \text{ N/mm}^2$
Stainless steel	$R_m = 650-700 \text{ N/mm}^2$