



**KATALOG
CATALOGUE**

KOMAC

**PLATE ROLLS BENDING
2020**

AKOMAC Sac İşleme Makinaları Üretici olarak, otomotiv ve metal sektörü için lider bir sağlayıcı olmuştur. AKOMAC tüm müşteri ihtiyaçları karşılamak için tasarlanmış geniş bir ürün yelpazesi sunmaktadır. 2000 yılından bu yana, AKOMAC müşteri memnuniyeti ve sürekli gelişim için hizmet vermeyi taahhüt edilmiştir.

Kalite odaklı üretim ve iyi müşteri desteği her zaman şirketin temel kuralı olmuştur. Makinelerimiz; güvenilir, dayanıklı ve hassas olacak şekilde tasarlanmıştır.

AKOMAC markası ve biz bir üretici olarak futuristik vizyonunu kanıtlanmıştır. Şirketin merkezi idealist, dinamik ve deneyimli dış ticaret ekibimizle müşterilerine daha fazla güven verir.

Biz "Saca şekil veren" cümlesi ile misyonumuzu belirler ve Bizim ürünlerimizden beklentileri ve kullanıcıların ihtiyaçlarını anlamak ve makineden daha fazla performans elde etmek için bunları sağlamaktır. Bu politika, müşteri memnuniyeti için hizmet eden, yüksek bilgi ve önemini göstermektedir.

AKOMAC, sahip olduğu tecrübeli pazarlama departmanı ile, Dünya piyasasına ve 5 kıtada 32 AKOMAC satıcısı ile ihracat yapmaktadır.

Makinelerimizde kullandığımız Ekipmanlar Dünyaca bilinen ve alanında lider markalardır. Bosch, Rexroth, Hoerbiger, Cybelec, Delem, ELGO, TELEMECHANIQUE, Siemens, Heidenhein'in, Givi Misura, Wilson, UNIMEC, Roller, Esa Kvara

AKOMAC, genç ve dinamik kadrosu ile gerçekçi hedefler doğrultusunda geçmişte olduğu gibi gelecekte de başarılı işlere imza atmayı hedef olarak seçmiştir.

BENDING & CUTTING MACHINES

EN

AKOMAC as the Manufacturer of Sheet Metal Working Machinery, has been a leading provider for the automotive and metal Industry.

AKOMAC offers a wide range of products designed to meet all demands. Since 2000, AKOMAC has been committed to serving for customers satisfaction and continuous development.

Quality oriented production and good Customer support have always been the basic rule of the company. Machines are designed to be reliable, durable and precise.

The AKOMAC brand have proven it's futuristic vision by it's development as a manufacturer. The headquarters of the company are fortunate idealist and dynamic. The experienced foreign trade intelligence grants more confidence to the customers.

We determine our mission with the sentence "We giving shape to the Sheet ". We perfectly understand the expectations and requirements of users from our product and provide them to get more performance from the machine. This policy shows our high knowledge and importance we serve to customers' satisfaction.

WHO DO WE WORK WITH

The AKOMAC exports high quality machines to many countries with On 5 continents and with 32 AKOMAC seller;

In Europe side : Germany, Denmark, France, Spain, Greece, Romania, Portugal, Poland, Hungary, Bosnia and Herzegovina, Lithuania, England, Serbia, Italy, Russia and Ukraine;

In Middle East side : Syria, Jordan, Saudi Arabia, Iraq, UAE, Madagascar, Lebanon, Kuwait, Qatar and Iran

In North America Side: United States, Canada, Mexico, Colombia

In South America Side : Brazil, Uruguay, Chile, Paraguay,

Far East Side : Vietnam, Singapore, Malaysia, China, South Korea,

In North Africa: Egypt, Libya, Algeria, Ethiopia, Sudan, Tunisia

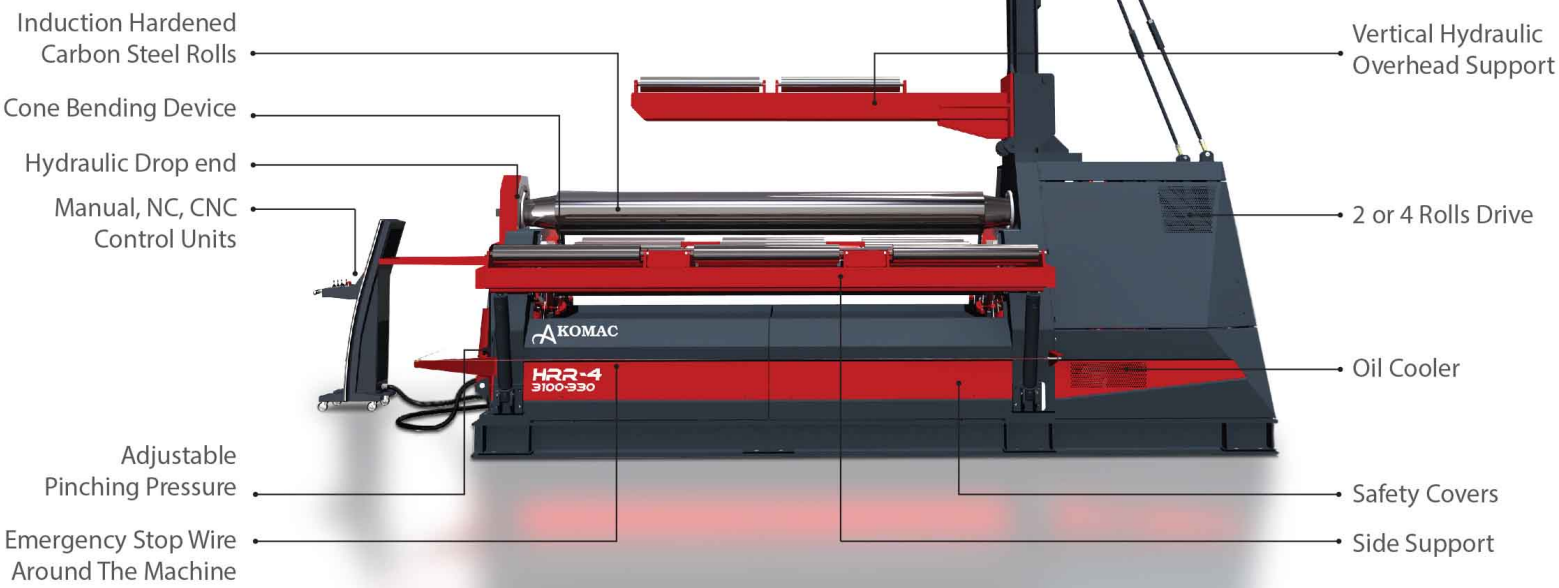
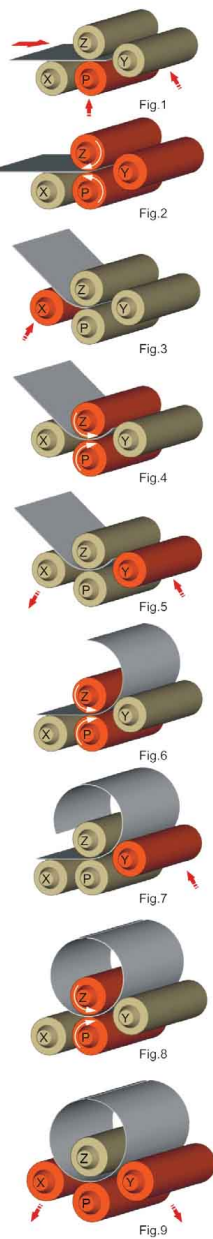
Australia

As in the past, the future of us contains more opportunities and developments for you to consider the special advantages we offer: High quality with competitive prices. Equipment attached are world known brands like Bosch, Rexroth, Horbiger, Cybelec, Delem, Elgo, Telemecanique, Siemens, Heidenhein, Givi Misura Wila, Wilson, Unimec, Roller, Esa Kvara.

As a sign of the success in manufacturing, our back-up service is ready to work for stabilization in your business. We offer you the best technical support.

BENEFITS OF **FOUR ROLL** BENDING MACHINES

- The fastest and most accurate bends are made by four roll machines. The plate is held securely in place between the top and bottom rolls while the side rolls move vertically to create the bend.
- The bottom roll moves up to hold the plate edge securely against the top roll while the side roll is raised to form an accurate pre-bend, minimizing the flat zone on the plate edge. Pre-bending on a double pinch three roll machine requires that plates be tilted down as they are being fed. In contrast, plates are loaded horizontally at the feed level for pre-bending on a four roll machine, which allows the use of horizontal motorized roller tables to help feed the plate.
- Plate feeding can take place on either side of a four roll machine. If fed from only one side, they can even be placed up against a wall to save floor space.
- The side rolls are positioned to the right and left of the bottom roll and are on their own axes. The independent axis of each roll helps make a perfect bend. The “back” side roll (at the far side of the feeding point) also functions as a back gauge to square the plate for proper alignment (see figure 1). This eliminates the need for someone to assist the operator.
- The plate is kept square without slipping during both pre-bending and rolling because of the constant secure clamping of the top and bottom rolls.
- Four roll machines do not require the operator to remove, flip, and then try to square the plate a second time after pre-bending, as is the case with three roll initial pinch (IP) machines. Keeping the material in the machine makes four rolls 50% more efficient than three roll IP machines, and allows a cylinder to be rolled to the required diameter immediately following pre-bending.
- Bending the back edge takes place after the cylinder is rolled, for a one direction, single pass operation.
- Cone rolling is easier on a four roll machine. The side rolls can be tilted to establish the cone angle and the bottom roll can also be tilted to clamp and drive the plate.
- Four roll machines are the only type of plate rolls that can effectively make use of NC and CNC controls because of the constant clamping and driving of the material during all steps of rolling. Bending difficult shapes like polycentric or elliptic work pieces can be easily done with CNC four roll machines.



With many solutions available, we can configure any machine to exactly match your requirements.

HR-4 SERIES

Planetary Type Hydraulic Four Roll
Light and Mid Plates, High Volume
1,2~ 4m Bending Lengths
Ø140 ~ Ø430 Top roll diameter
2 ~ 44mm Capacity

See pages 19-22.



HRR-4 SERIES

Rectilinear Type Hydraulic Four Roll
Mid and Heavy Plates, High Volume
2 ~ 4m Bending Lengths
Ø330~ Ø760 Top roll diameter
8 ~ 95mm Capacity

See pages 23-26.



HR-3 SERIES

Planetary Type Hydraulic Three Roll
Versatile, Mid Plates, Job Shops
2~ 4m Bending Lengths
Ø200 ~ Ø430 Top roll diameter
4 ~ 44mm Capacity

See pages 27-29.



VR-3 SERIES

Variable Geometry Hydraulic Three Roll
Mid and Heavy Plates, Rolling Shops
2,5~ 4m Bending Lengths
Ø350 ~ Ø680 Top roll diameter
10 ~ 85mm Capacity

See pages 30-34



MR SERIES



Motorized Initial Pinch Three Roll Light Sheets, Low Volumes

These initial pinch rolls are designed for small part bending with low operation cost. MR rolls feature robust steel frames, chain and gearbox drive systems and electric motors with a magnetic break which eliminates drifting. They also offer foot pedals with forward, reverse, and emergency stop along with a safety wire and limit switch. A very economical, reliable, and efficient choice for your small parts needs. See pages 35-40.



MRA Series

1m ~ 2m Bending Lengths
68mm ~ 75mm Top roll diameter
Up to 2mm Capacity



MRB Series

1m ~ 2m Bending Lengths
90mm ~ 100mm Top roll diameter
Up to 3mm Capacity



MRC Series

1m ~ 2,5m Bending Lengths
110mm ~ 140mm Top roll diameter
Up to 5,5mm Capacity



MRD Series

1m ~ 3m Bending Lengths
150mm ~ 180mm Top roll diameter
Up to 10mm Capacity

		MR	HR-3	VR-3	HR-4	HRR-4
Rolls		3	3	3	4	4
Bending Length Range		1-3m	2-4m	2,5-4m	1,2-4m	2-4m
Top Roll Diameter		68-180mm	200-430mm	350-680mm	140-430mm	330-760mm
Thickness Range		Up to 9mm	Up to 44mm	Up to 85mm	Up to 44mm	Up to 100mm
Custom Lengths and Thickness		O	O	O	O	O
Obtainable Production Tolerances	Fine					
	Excellent					
Part Geometries (without experienced operator)	Simple					
	Moderate					
	Complex					
Production Speed	Medium					
	High					
Controls	Digital Read-out	O	N/A	N/A	N/A	N/A
	PLC	N/A	S	S	S	S
	NC	N/A	N/A	O	O	O
	CNC	N/A	N/A	N/A	O	O
Software	ESA Offline Simulator (Available on CNC models)	N/A	N/A	N/A	O	O
Frame	Solid Steel Frame	S	N/A	N/A	N/A	N/A
	Stress Relieved Steel Construction	N/A	S	S	S	S
Rolls	AISI 1050 Carbon Steel Rolls	S	S	S	S	S
	AISI 4140 High Strength Alloy Steel Rolls	O	O	O	O	O
	Induction hardening + Polish	O	S	S	S	S
	Induction hardening + Ground	O	O	O	O	O
Rolls Drive System	Electrical Motor + Gearbox (Top - Bottom Rolls)	S	N/A	N/A	N/A	N/A
	Hydraulic Motor + Planetary Gearbox (Top Roll)	N/A	N/A	S	N/A	N/A
	Hydraulic Motor + Planetary Gearbox (Top & Bottom Rolls)	N/A	N/A	N/A	S	S
	Hydraulic Motor + Planetary Gearbox (All Rolls)	N/A	S	N/A	O	O
Roll Positioning System	Manual Bottom & Side Roll	S	N/A	N/A	N/A	N/A
	Motorized Side Roll	O	N/A	N/A	N/A	N/A
	Motorized Side Roll (MRD Series)	S	N/A	N/A	N/A	N/A
	Motorized Bottom Roll	O	N/A	N/A	N/A	N/A
	Hydraulically Acted with Electronically Positioned and Synchronized Bottom / Side Rolls	N/A	S	S	S	S

S = Standard / O = Option / N/A = Not Applicable

Safety	Safety Wire Around the Machine and Emergency Stop Button	MR	HR-3	VR-3	HR-4	HRR-4
Lubrication Systems	Manual lubrication	S	S	S	S	S
	Automatic central lubrication	N/A	O	O	O	O
Oil Cooler / Heater	Oil Cooler	N/A	O	O	O	O
	Oil Heater	N/A	O	O	O	O
Variable Speed	Variable Speed for Roll Rotation (Std. on CNC Control)	N/A	O	O	O	O
Special Color	Special Color	O	O	O	O	O
Air Conditioning	Air Conditioning for Electrical panel	N/A	O	O	O	O
Hydraulic Vertical Overhead Support Systems	Preparation for vertical support system	N/A	O	O	O	O
	Vertical support - Hydraulic	N/A	O	O	O	O
	NC inclusion for vertical support control (Available on CNC control)	N/A	N/A	N/A	O	O
Hydraulic Side Support Systems	Preparation for side support system	N/A	O	O	O	O
	Side Support System (Both Side)	N/A	O	O	O	O
	NC inclusion for side support control (Available on CNC control)	N/A	O	N/A	O	O
Feeding Systems	Material Feeding Table - L=3m	N/A	O	O	O	O
	Material Feeding Table - Motorised - L=3m	N/A	O	O	O	O

BENDING CAPACITIES AND CALCULATIONS

Our machines capacities are defined for (260 N/mm²) yield strength plates on multistep bending. For different yield, length and thickness plates you can use “Bending Capacity Chart”

HR-4 3100-330

BENDING LENGTH (mm)

3000

PREBENDING CAPACITY (mm)

16

ROLLING CAPACITY (mm)

20

TOP ROLL DIAMETER (mm)

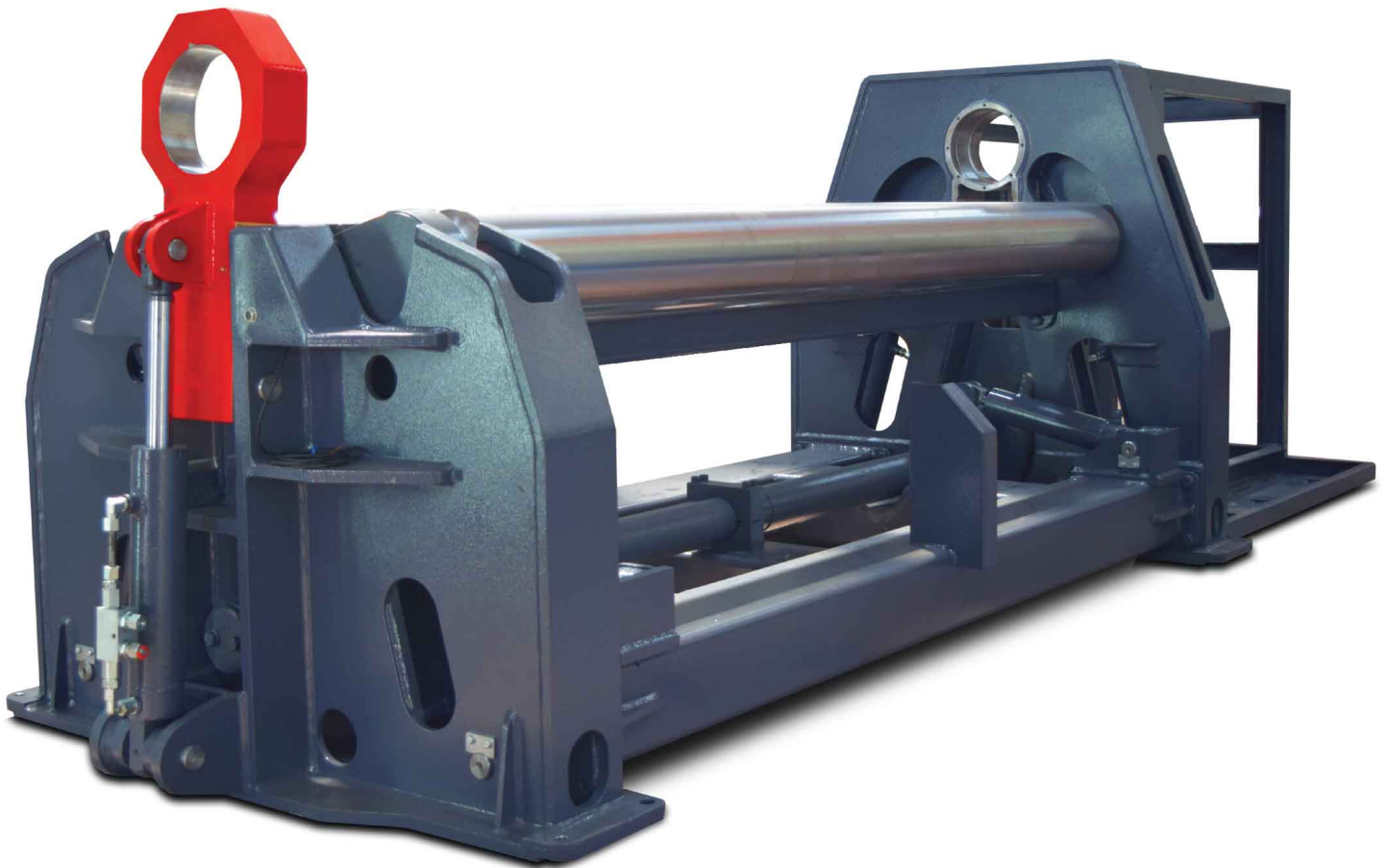
330

Bending Capacity Chart

PLATE WIDTH		3000 100% Width		2700 90% Width		2400 80% Width		2100 70% Width		1800 60% Width		1500 50% Width		1200 40% Width		900 30% Width		600 20% Width	
MATERIAL TYPES		Inside Diameter	Pre-Bending Thickness	Rolling Thickness	Pre-Bending Thickness	Rolling Thickness	Pre-Bending Thickness	Rolling Thickness	Pre-Bending Thickness	Rolling Thickness	Pre-Bending Thickness	Rolling Thickness	Pre-Bending Thickness	Rolling Thickness	Pre-Bending Thickness	Rolling Thickness	Pre-Bending Thickness	Rolling Thickness	
CLASS-1 MATERIAL Max Yield Strength		363	14.6	16.2	15.4	17.0	16.4	18.1	17.5	19.3	18.9	20.9	20.7	22.9	23.2	25.5		29.5	
		429	15.5	16.7	16.4	17.6	17.3	18.7	18.5	20.0	20.0	21.6	21.9	23.6	24.5	26.4		30.5	
		495	16.4	17.1	17.3	18.0	18.3	19.1	19.6	20.4	21.1	22.0	23.2	24.1		27.0		31.2	
		660	17.2	17.5	18.2	18.4	19.3	19.5	20.6	20.9	22.2	22.5	24.4	24.7		27.6		31.9	
		990	17.8	18.5	18.8	19.5	19.9	20.7	21.3	22.1	23.0	23.9	25.2	26.2		29.3			
207	30,000	1320	19.0	19.7	20.0	20.8	21.2	22.1	22.7	23.6	24.5	25.5		27.9	31.2				
		1650	20.3	21.5	21.4	22.7	22.7	24.1	24.3	25.7		27.8		30.5					
		3300	21.5	23.3	22.7	24.6	24.1	26.1		27.9		30.1							
CLASS-2 MATERIAL Max Yield Strength		363	13.6	15.0	14.3	15.8	15.2	16.8	16.3	17.9	17.6	19.4	19.2	21.2	21.5	23.7	24.8	27.4	
		396	14.4	15.5	15.2	16.3	16.1	17.3	17.2	18.5	18.6	20.0	20.4	21.9	22.8	24.5		28.3	
		495	15.2	15.8	16.0	16.7	17.0	17.7	18.2	18.9	19.6	20.4	21.5	22.4	24.0	25.0	28.9		
		660	16.0	16.2	16.9	17.1	17.9	18.1	19.1	19.4	20.7	20.9	22.6	22.9	25.3	25.6	29.6		
		990	16.6	17.2	17.5	18.1	18.5	19.2	19.8	20.6	21.4	22.2	23.4	24.3		27.2	31.4		
248	36,000	1320	17.6	18.3	18.6	19.3	19.7	20.5	21.0	21.9	22.7	23.7	24.9	25.9		29.0			
		1650	18.9	20.0	19.9	21.1	21.1	22.4	22.6	23.9	24.4	25.8		28.3	31.6				
		3300	20.0	21.7	21.1	22.8	22.4	24.2	23.9	25.9		28.0		30.6					
CLASS-3 MATERIAL Max Yield Strength		363	11.3	12.5	12.0	13.2	12.7	14.0	13.6	15.0	14.6	16.2	16.0	17.7	17.9	19.8	20.7	22.9	
		429	12.0	12.9	12.7	13.6	13.4	14.5	14.4	15.5	15.5	16.7	17.0	18.3	19.0	20.4	21.9	23.6	
		495	12.7	13.2	13.4	13.9	14.2	14.8	15.2	15.8	16.4	17.1	17.9	18.7	20.1	20.9	23.2	24.1	
		660	13.3	13.5	14.1	14.2	14.9	15.1	16.0	16.2	17.2	17.5	18.9	19.1	21.1	21.4	24.4	24.7	
		990	13.8	14.4	14.6	15.1	15.4	16.0	16.5	17.2	17.8	18.5	19.5	20.3	21.8	22.7	25.2	26.2	
345	50,000	1320	14.7	15.3	15.5	16.1	16.4	17.1	17.6	18.3	19.0	19.7	20.8	21.6	23.2	24.2		27.9	
		1650	15.8	16.7	16.6	17.6	17.6	18.7	18.8	19.9	20.3	21.5	22.3	23.6	24.9	26.4	30.5		
		3300	16.7	18.1	17.6	19.1	18.7	20.2	19.9	21.6	21.5	23.3	23.6	25.6		28.6			
CLASS-4 MATERIAL Max Yield Strength		363	10.0	11.0	10.5	11.6	11.1	12.3	11.9	13.1	12.8	14.2	14.1	15.5	15.7	17.4	18.2	20.0	
		429	10.5	11.3	11.1	12.0	11.8	12.7	12.6	13.6	13.6	14.6	14.9	16.0	16.7	17.9	19.2	20.7	
		495	11.1	11.6	11.7	12.2	12.4	13.0	13.3	13.9	14.4	15.0	15.7	16.4	17.6	18.3	20.3	21.2	
		660	11.7	11.9	12.3	12.5	13.1	13.3	14.0	14.2	15.1	15.3	16.6	16.8	18.5	18.7	21.4	21.6	
		990	12.1	12.6	12.8	13.3	13.5	14.1	14.5	15.0	15.6	16.2	17.1	17.8	19.2	19.9	22.1	23.0	
448	65,000	1320	12.9	13.4	13.6	14.1	14.4	15.0	15.4	16.0	16.6	17.3	18.2	19.0	20.4	21.2	23.5	24.5	
		1650	13.8	14.6	14.6	15.4	15.4	16.4	16.5	17.5	17.8	18.9	19.5	20.7	21.8	23.1	25.2	26.7	
		3300	14.6	15.9	15.4	16.7	16.4	17.7	17.5	18.9	18.9	20.5	20.7	22.4	23.1	25.1	28.9		
HIGH YIELD		363	8.0	8.8	8.5	9.3	9.0	9.9	9.6	10.6	10.4	11.4	11.3	12.5	12.7	14.0	14.6	16.2	
		429	8.5	9.1	9.0	9.6	9.5	10.2	10.2	10.9	11.0	11.8	12.0	12.9	13.4	14.5	15.5	16.7	
		495	9.0	9.3	9.5	9.9	10.0	10.4	10.7	11.2	11.6	12.1	12.7	13.2	14.2	14.8	16.4	17.1	
		660	9.4	9.6	10.0	10.1	10.6	10.7	11.3	11.4	12.2	12.3	13.3	13.5	14.9	15.1	17.2	17.5	
		990	9.8	10.1	10.3	10.7	10.9	11.3	11.7	12.1	12.6	13.1	13.8	14.4	15.4	16.0	17.8	18.5	
689	100,000	1320	10.4	10.8	10.9	11.4	11.6	12.1	12.4	12.9	13.4	14.0	14.7	15.3	16.4	17.1	19.0	19.7	
		1650	11.1	11.8	11.7	12.4	12.5	13.2	13.3	14.1	14.4	15.2	15.8	16.7	17.6	18.7	20.3	21.5	
		3300	11.8	12.8	12.4	13.5	13.2	14.3	14.1	15.3	15.2	16.5	16.7	18.1	18.7	20.2	21.5	23.3	

Due to our ongoing product development, the specifications given in this catalog are subject to change without notice.

ROBUST STEEL STRUCTURE



Precision of the roll bending machines depends on the robustness of the frames and chassis. AKOMAC roll bending machines are designed with box construction with heavy metal plates. The frames are connected to each other by a strong box design chassis that can meet the torsional moments very well instead of sitting on a simple design H or U beams. Frames and chassis are stress relieved after the welding operation. The whole body is machined with 5-axis CNC machining centers utilizing a fixed single reference point. This allows for parallelism of all axes and precise surfaces, as well as longevity and precision of the critical characteristics of the machine.



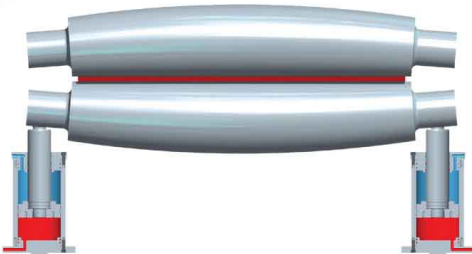
ROLLS & CROWNING



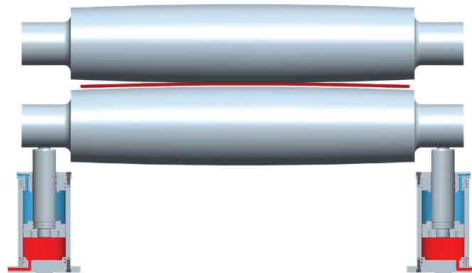
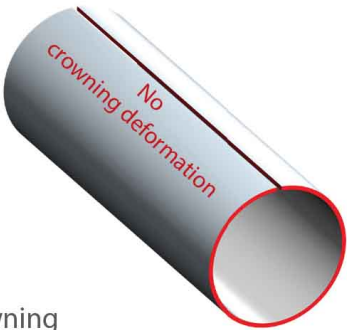
The most important elements of a plate roll machine are the rolls themselves. Most machines in the market have smaller diameter, weak rolls that deform during the pre-bending process and create a flat spot on the plate edge.

AKOMAC designed the rolls with larger diameter and uses high tensile forged steel rolls that are machined by high precision CNC lathes. The working surfaces of the rolls are CNC induction hardened to HRC 54-58 (5-6 mm depth) with hardness tests performed at varying points on the rolls. The smallest bending diameter of 1.1 x top roll diameter is easily achieved.

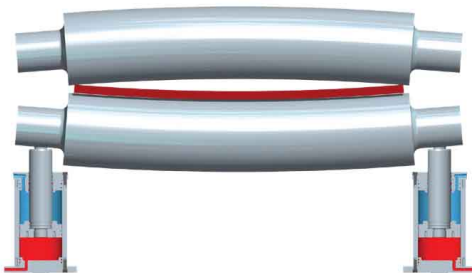
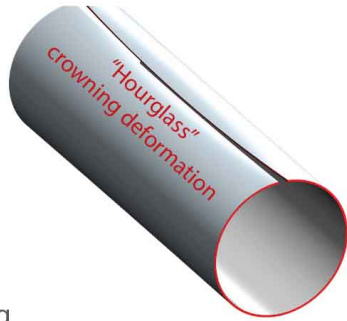
The rolls are machined with a crown to compensate for roll deflection during the pre-bending process. Custom crown machined rolls for different materials or thickness can be applied free of charge when ordering.



Bending thickness is compatible with roll crowning



Bending thickness is thinner than roll crowning

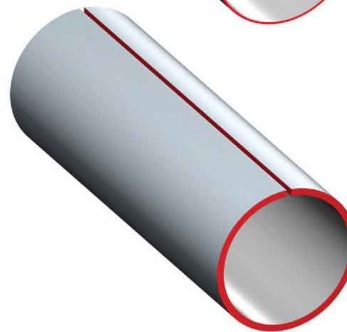
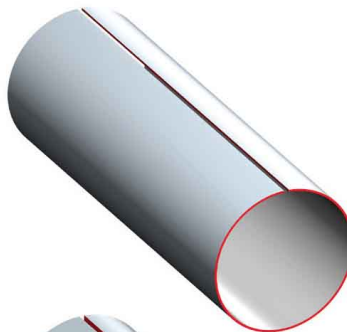
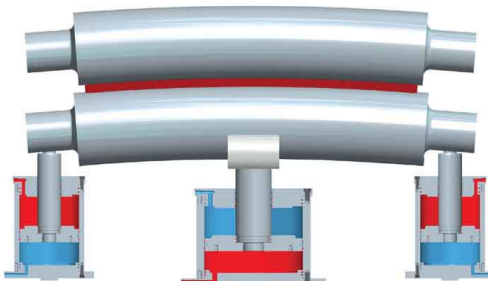
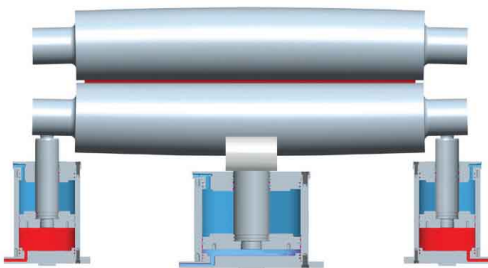


Bending thickness is thicker than roll crowning



OPTIONAL DYNAMIC ROLL CROWNING

In some cases, plate thicknesses can be a very wide range. In this case, it is necessary to eliminate the crowning problems with the dynamic roll crowning system. The system basically serves only to support the rollers for thin plates, while bending thick plates, the hydraulic crowning cylinder apply negative crown to rollers from bottom to eliminate the deflection that may occur during pre-bending. This system helps to get smoother pre-bend edge.



HYDRAULIC DROP END

Hydraulic drop ends on HR-4 series 4 Rolls - allow for easy removal of formed pieces. Cone snubber is a standard feature that is placed on a top roll bearing allowing easy rotation of snubber (so it can not interfere with extraction)

On our HRR-4 series 4 Rolls - the heavy duty roller snubber system is mounted to the main frame of the machine. The top roll is hydraulically tilted up to allow for easy removal of formed parts.



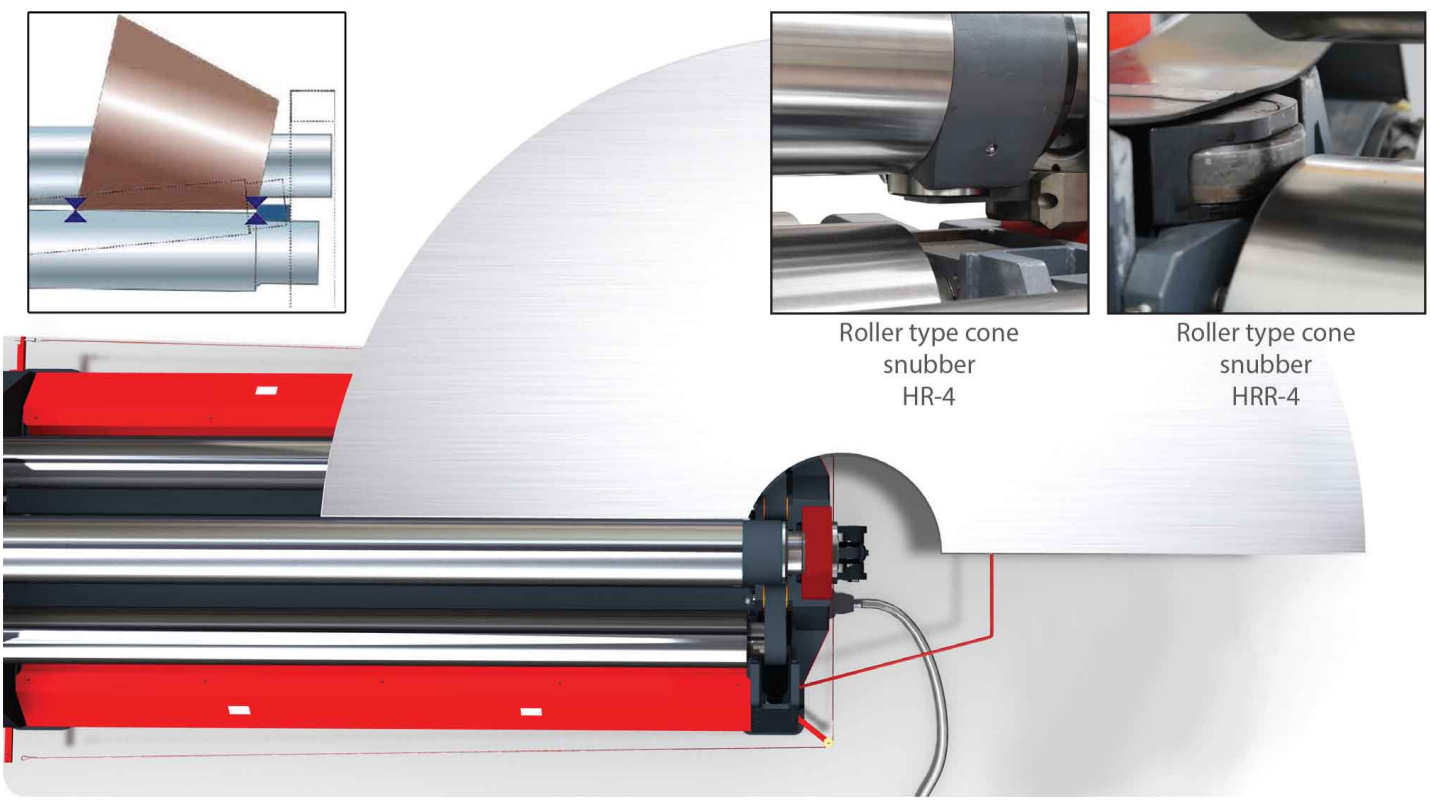
HR-4 Series: Fixed top roll

HRR-4 Series: Tilttable top roll

CONE BENDING

Through superior construction, a massive body and the ability to angle the bottom and side rolls, you can easily bend wide angle and small diameter conical parts.

While most machines on the market can conically bend 3 times the diameter of the top roll, AKOMAC 4 roll plate bending machines can conically bend 1.5 times the top roll diameter (or tighter).



HYDRAULIC & ELECTRIC SYSTEM

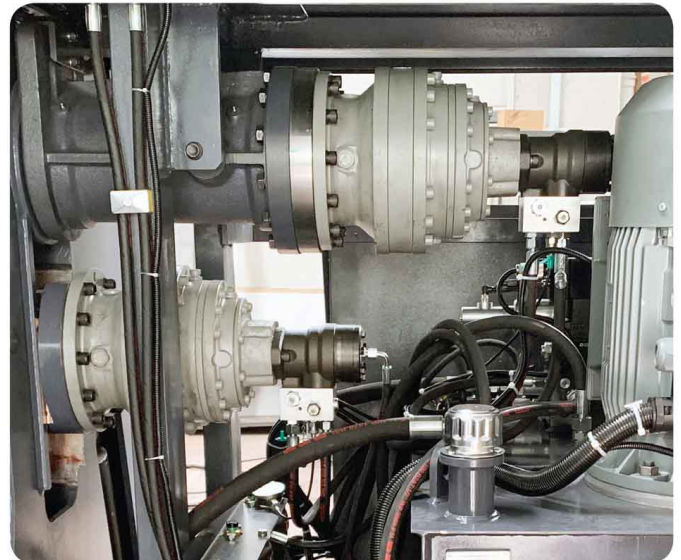
Our HR-3, VR-3, HR-4 and HRR-4 series plate roll bending machines movements are actuated by hydraulic components. The precision of all axes are acquired by world leader Duplomatic valve's high speed response ability along with pressure safety valves used against peak pressures and overload, provides protection for motors and other components. The electrical system is designed to be compatible with CE safety regulations. The system consists of well known electrical components such as Siemens, Schneider, Omron and Opkon.



HIGH TORQUE DRIVE SYSTEM

With its high torque, AKOMAC plate rolls can bend the sheet with fewer steps. Rolls are driven by directly coupled independent high torque M+S hydraulic motors and Bonfiglioli planetary gearboxes.

A drive system is positioned on the same axis as the roll, which transfers the torque to the plate without losing torque. Some of the machines in the market has universal cardan joints but we prefer direct drive and this is the best power transmission with less backlash. Strong Hydraulic Brakes : Especially during the pre-bend, our system does not allow the sheet to slip back and create safety problems.



IDEAL PLATE PINCHING

In HR-4 series roll bending machines, plates clamping is achieved by a robust torsion bar which moves the lower roll. Torsion bar is driven by 2 hydraulic cylinders ensures the best parallel pinch of the plate. With a third hydraulic cylinder on the torsion bar is tilt the lower roll when the cone bending.

In the HRR-4 series, the lower roll is acted by strong hydraulic cylinders at the both ends. Synchronization between each other is ensured by electronically with in 0.1mm tolerance.



OPTIONAL SIDE AND OVERHEAD SUPPORT SYSTEM

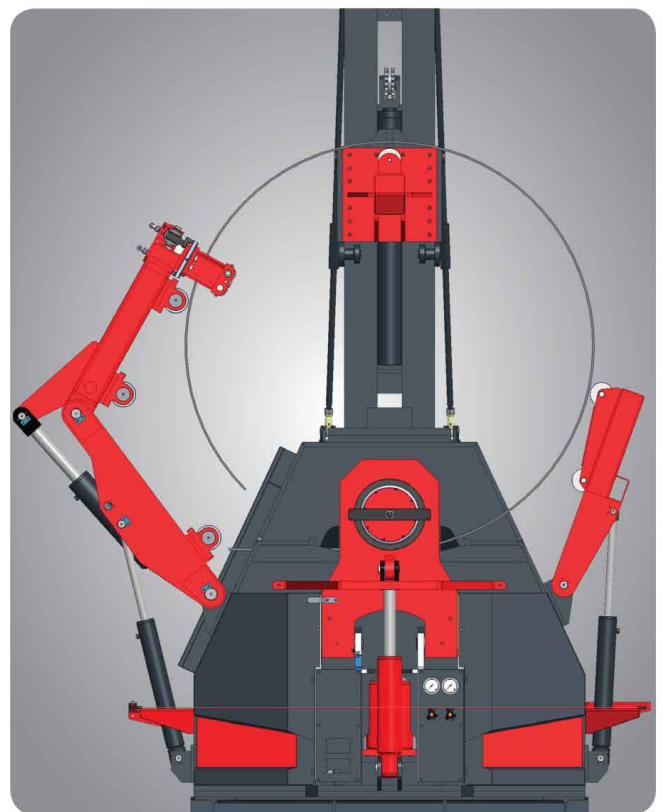
Optional hydraulic side or overhead supports help prevent distortion of the cylinder in large shaped bends. Side supports have hydraulic double cylinders which are produced with heavy-duty steel construction. The vertical support capacity can be manufactured to different tonnage and height requirements.



CUSTOM PLATE SUPPORT SYSTEMS



Cartesian type overhead support



Dual knuckle side support with
edge alignment clamps

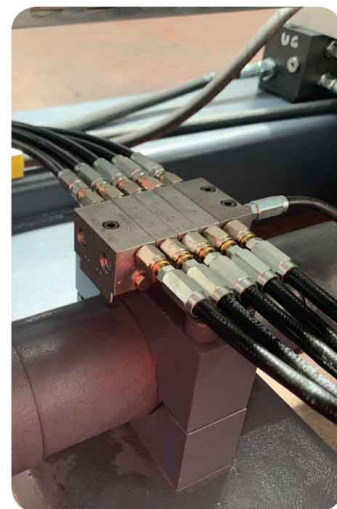
OPTIONAL QUICK CHANGEABLE TOP ROLL

Sometimes the diameter of the parts to be bent may be smaller than the standard upper roller. In this case the interchangeable upper roller with a smaller diameter can be easily replaced with the standard upper roller, which increases the versatility of the machine. Custom crowning or custom shaped upper rolls can also be easily attached to our plate rolls to accommodate specific applications.



OPTIONAL AUTOMATIC LUBRICATION SYSTEM

In our roll bending machines, rollers are turn on roller bearings and bronze bushings. A machine with standard features has 10 lubrication points and must be lubricated with grease at regular intervals. However, sometimes machine operators may forget to lubricate, which can cause serious problems at all running points. Automatic lubrication system is a complete solution to avoid such a problem. In addition to air-powered models, we also have motorized lubrication solutions. NC and CNC control units can be programmed in desired time intervals and desired quantity as long as they operate the machine.



OPTIONAL GAS SHOCK ABSORBER

When the plates are bent, welding process begins on the machine. In particular, the combination of tension that occurs during welding of thin plates point inward pulling thus causes the deterioration of cylindrical form. So, expressed as re-rolling must be done after the welding operation in calibration. However, often the welding would be thicker than the plate thickness and shall not be cleaned. On standard machines welding cannot pass through between top and bottom rolls if plate is pinched. If clamping pressure too much and welding area too thick, rolls have chances of getting damaging dents to roll surface.

Anerka has developed gas shock absorber to eliminate this problem. Each end of the lower roller system on the hydraulic accumulators we connected to the hydraulic cylinders and lower roll when the desired deflection controlling valves consists of. Thus, when welding passing through the roller, lower roller moves up and down automatically.

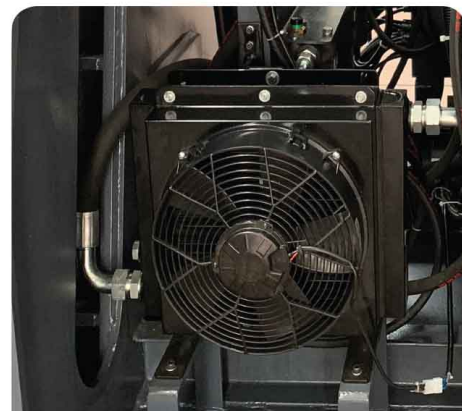


OPTIONAL OIL COOLER & HEATER

In countries where the air temperature is high, the oil of the machines may increase depending on the working intensity. The viscosity of the warm oil decreases and viscosity to an increase in tolerances, particularly when positioning hydraulic cylinders specially NC or CNC controlled machines.

To prevent this, air oil coolers are used.

Again, the viscosity of the oil decreases in regions where the air temperature is cold. In this case, the heater is placed in the tank so that the oil reaches the proper temperature before the first start in the morning.



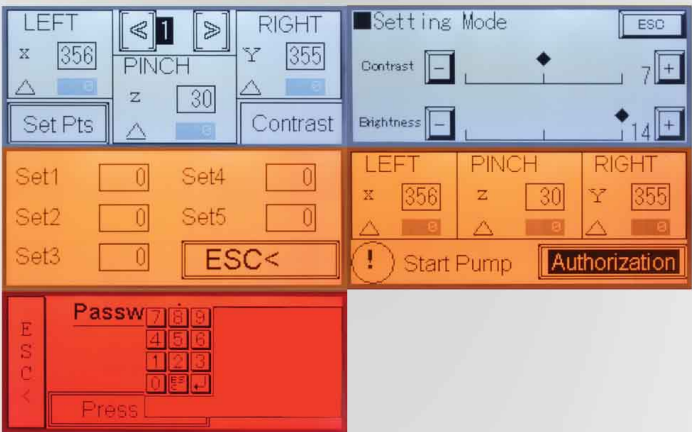
PLC CONTROL SYSTEM (STANDARD)

The PLC Electronic balancing system ensures the synchronous operation of the bottom and side rollers of the HR-3, HR-4, HRR-4 series machines. This process is provided by PLC and touch operator panel which controls 6 axes. In addition, ease of use and time saving are provided by the ability to program up to 5 set points of the previously experienced bending values.



PLC Control Unit

- Dedicated scratch-proof, oil-proof, acid-resistant IP65 sealed touch panel
- PLC
- Panasonic 32 I/O
- Memory
- 5 Mbyte
- Display
- Monochrome LCD 3" touch screen
- Resolution
- 128 (W) x 64 (H)
- 3 colors led backlight (green,red, orange)
- Communication port 1 RS232C Serial Port
- Temprature -20 / 60°C



- Software
- Manual working mod,
 - Standard 6 axes (X1,X2,Y1,Y2,PP1),
 - 3 colors display for machine situation
 - Conic and parallelism control
 - 5 set point programing,
 - Contrast adjusting ,
 - Turkish,English, German, French, Spanish, Polish, Hungarian, Croation languages.
 - Alarm list.

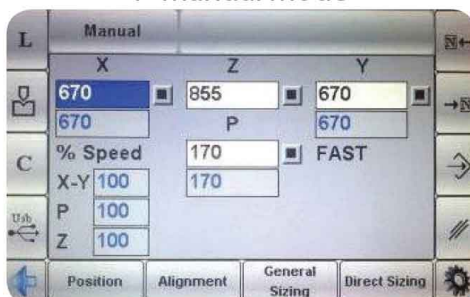
OPTIONAL NC (SIMPLE CNC)



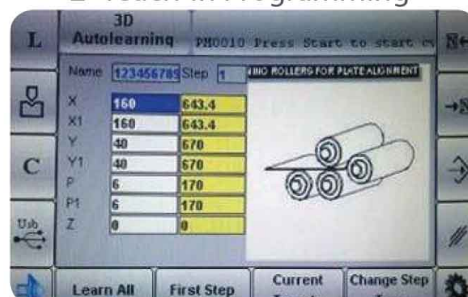
NC control system, in addition to the PLC control system, has the property to work manual, teach-in and automatic modes of operation. In manual mode, the use of all functions are provided by the operator. In teaching mode for the operator to twist all the steps are recorded respectively. In automatic mode all recorded movements are repeated, respectively by the machine.

Thanks to the software we developed, the NC unit also calculates the theoretical bending steps one by one. The operator can achieve perfect bend only by changing the pre-bend and rolling values that calculated by the software. NC control system has the capacity to save 2500 programs consisting of Max 100-steps.

1- Manual Mode



2- Teach-In Programming



3- Select material, enter thickness





NC Control Unit (S530)

Dedicated scratch-proof, oil-proof, acid-resistant IP65 sealed membrane push buttons with 51 keys
Fiberoptic communication lines.

PLC
Esa/Gv

CPU
AMD Geode™ LX800 500MHz

Memory
256 Mbyte DRAM for CPU
1 Mbyte SRAM for parameters

Display
Color TFT-LCD 7" WVGA (16:9)
Resolution (800 x 480, (R.G.B)) 262,144 colors

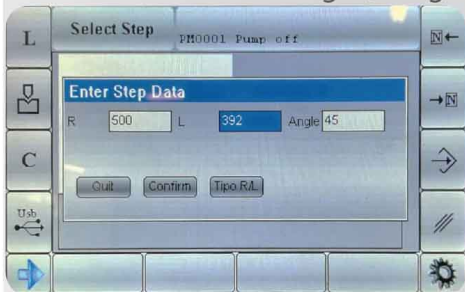
Communication ports 1 Ethernet Port
1 CAN interface
1 RS232C Serial Port
2 USB Port, 1 VGA Out

Temperature -25 / 70°C

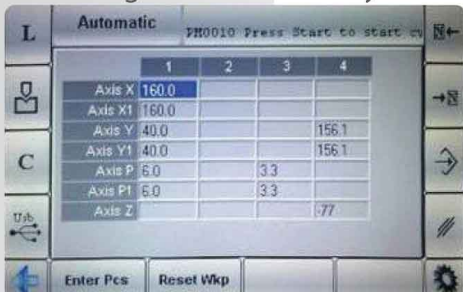
Software
Manual, teach-in and automatic working modes,
Standard 7 axes (X1,X2,Y1,Y2,P1,P2,Z),
Conic and parallelism control
Dual speed,
100 step, 2500 program memory,
User friendly program editor,
USB port for programs backup ,
Parts quantity programing,
Working hours counter,
Metric and imperial units,
Automatic turn off programing,
Turkish, English, German, French, Spanish, Italian,
Russian, Polish, languages.
Alarm list.



4- Enter radius and arc angle / length



5- Program Calculated by NC



6- Saved programs

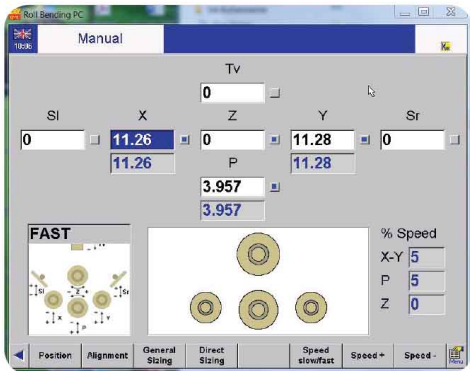


OPTIONAL CNC

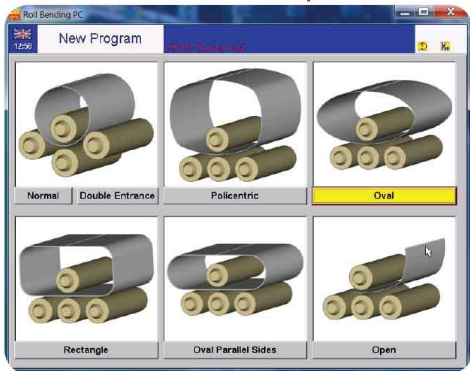


The CNC unit, with its graphical control system allows the bending to be done step by step or by automatically calculating the bending steps. Due to changes in the structure of the material, corrections must be entered for pre-bending and bending steps after the first bended plate to get the desired bending form. Correction coefficients can be recorded to software for using them in similar characteristic material bending operations. With the CNC control you can easily bend parts into shapes such as: cylindrical, polycentric, elliptical, oval, parallel side, rectangular, and arc. CNC unit has interpolation capability due to proportional valves. The CNC unit can store more than 2,000,000 programs. The easy to use editor page also allows for simple editing of any saved programs. The unit also comes with a USB port allowing for easy up or downloading of your programs. You can also connect the control directly with your computer using an Ethernet cable. This also allows our service team to remote in if diagnosis is ever necessary. This also allows our service team to remotely access the machine if diagnosis is ever necessary. Lubrication system (offered as an option) operating times can be set at the control unit. Plate feeder, vertical and side sup-ports (offered as an option) can be included as NC functions (teachable) into control unit. So supports can be programmed in teach-in mode and provided automatically during bending.

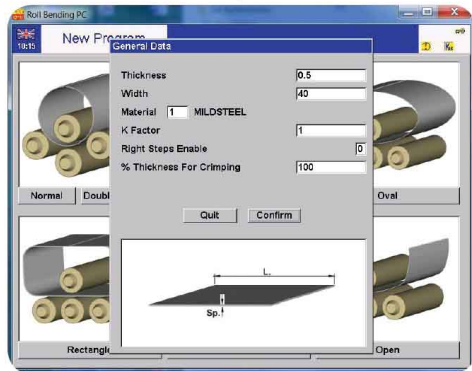
1- Manual Mode



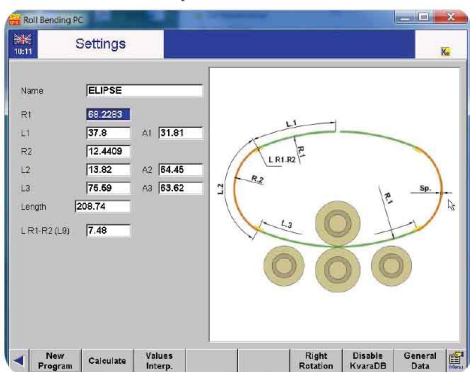
2- Select shape



3- Select material, enter thickness



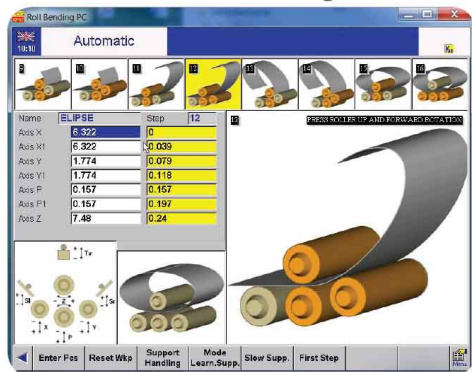
4- Enter part dimensions



5- Program Calculated by CNC

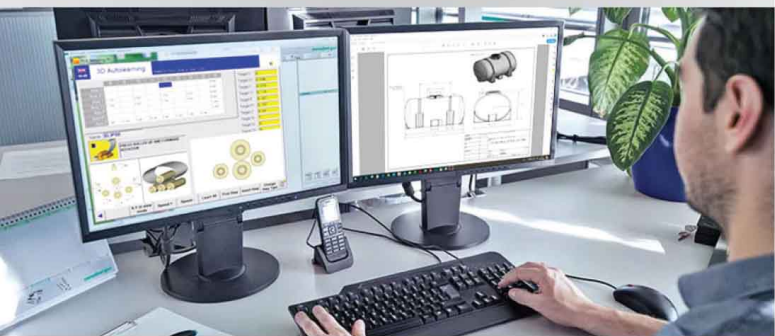


6- Start bending





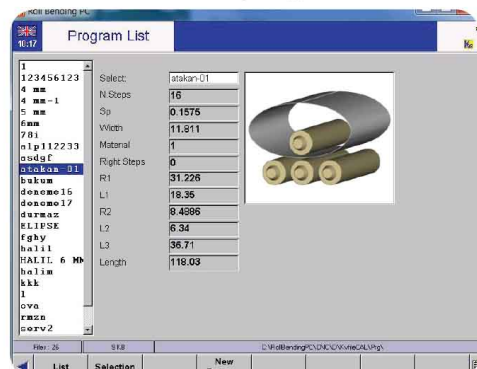
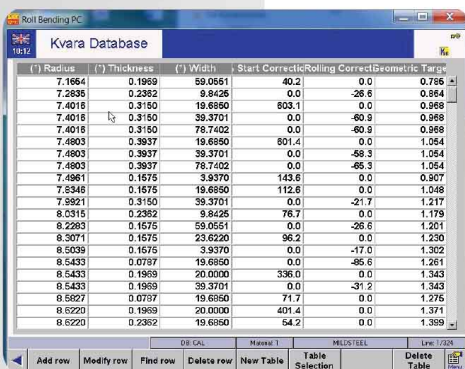
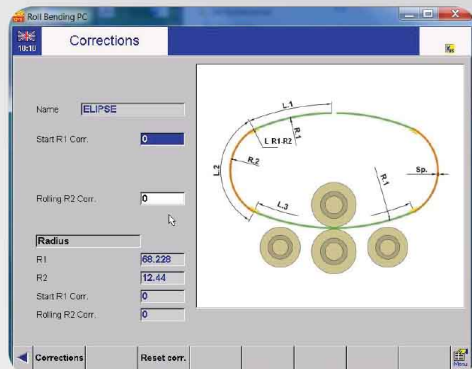
Offline software for Windows



7- Make corrections

8- Insert corrections to database

9- Saved programs



CNC Unit (S550 PC)

Standard 7 axes (X1,X2,Y1,Y2,P1,P2,Z)

Standard 32 inputs and 32 outputs

15" TFT XGA color touch display with antiglare screen
Dedicated scratchproof, oil-proof IP65 keyboard with 28 keys

2.5" Hard disk drive 20GBytes or more

Hand wheel for adjustable turning speed

Industrial keyboard (USB)

Technology:

CPU PC: Intel Atom N270 1,6Ghz with 1Gb of RAM

CPU CNC: AMD Geode ETX-LX800 500 Mhz, with 128Mb

Communication ports:

1 serial ports RS-232, 3 USB ports,

2 Ethernet port on the PC

2 serial ports RS-232, 2 USB, 1 Ethernet port,

1 Can Open Port on CNC

Fiber optic interface

Local area network

User memory:

Hard disk for more than 2.000.000 programs,

Software specifications:

Windows® 10 operating system

Manual, teach-in and automatic working modes,

Conic and parallelism control,

Interactive 2D graphic editor for work-pieces and tools data entry ,

2D graphic display of machine rolls,

2D automatic identification of the best bending sequence ,

Programming of the axes positions in tabular mode with automatic syntactical checks,

Automatic calculation of the X,R,P and Z axes positions for cylindrical, polycentric, oval, oval parallel sides, rectangular, arc bending shapes,

Material database of common steel plates,

X-Z / Y-Z (Side Roll & Rotation) axes interpolation capability

Parts quantity programing, Working hours counter,

Metric and imperial units,

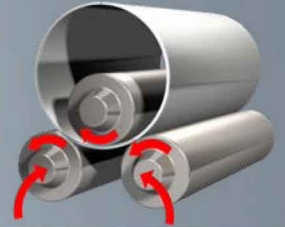
Offline programming

Turkish, English, German, French, Spanish, Italian, Russian, Polish, languages.

Alarm messages

HR-3

HYDRAULIC PLANETARY TYPE THREE ROLL BENDING MACHINE



HR-3 - Planetary gearboxes

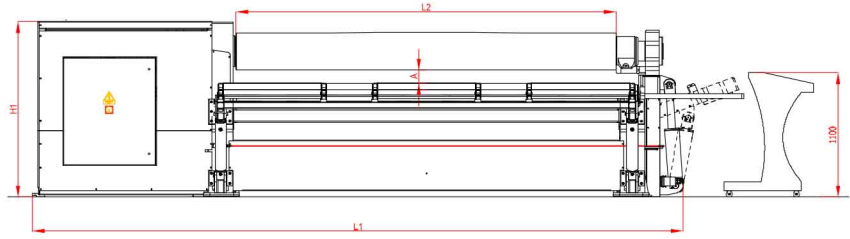
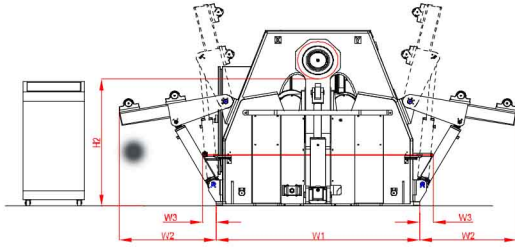


Versatile, Mid Plates, Job Shops

HR-3 series hydraulic 3 roll plate bending machines usually ideal for obtaining large diameters. Large diameter cylindrical bends used in silos, oil and water tanks, feed and grain bins can be made easily on these machines. The symmetrical 3-roll arrangement allows pre-bending to both ends of the plate if required. Although the bending process is slower than that of 4 roll machines, all kinds of profiles can be bend on these machines as well as plates due to the greater pass through.



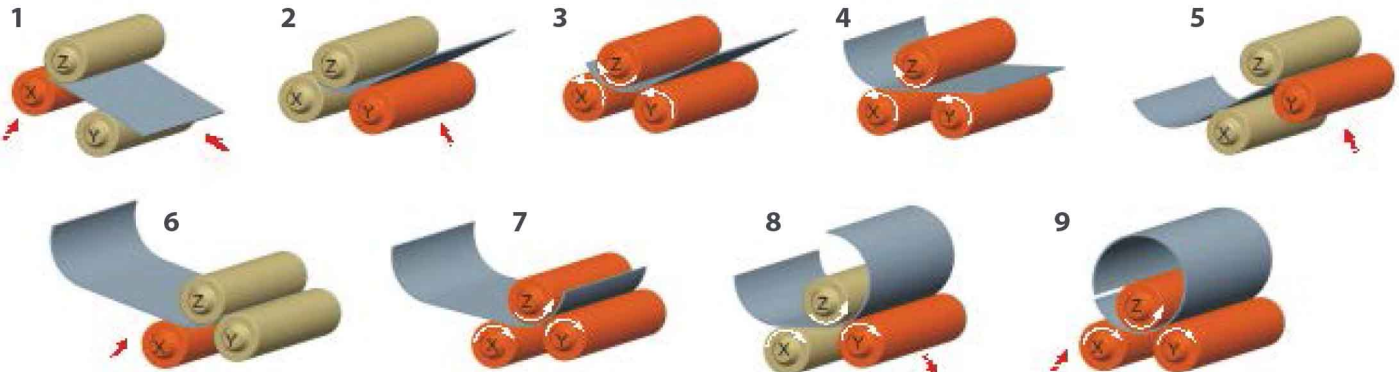
HR-3



TYPE	Bending Length L2 (mm)	Min. Int. Dia Ø Dmin			Top Roll Ød (mm)	Side Rolls Ø (mm)	Max. Pass Through A (mm)	Length L1 (mm)	Width W (mm)	Height H1 (mm)	Working Height H2 (mm)	Width of Side Support W2 (mm)	Weight (kg)	Motor Power (kW)	Min. Additional top roll diameter Ø (mm)	Hydraulic Tank Capacity (lt)
		Pre-Bending Capacities t (mm)	Bending Capacities T (mm)	Bending Capacities T (mm)												
HR-3 2050-200	2050	6	8	10	200	180	90	3830	1160	1180	840	665	3420	7.5	200	160
HR-3 2050-210	2050	8	10	12	210	190	80	3830	1160	1180	835	665	3600	7.5	200	160
HR-3 2050-230	2050	10	13	15	230	200	70	3830	1160	1180	825	665	3800	11	200	160
HR-3 2050-270	2050	13	16	18	270	250	140	4260	1660	1590	1155	800	6850	15	270	400
HR-3 2050-300	2050	16	20	22	300	270	115	4260	1660	1590	1140	800	7300	18.5	270	400
HR-3 2050-330	2050	20	25	28	330	290	90	4260	1660	1590	1125	800	7930	22	270	400
HR-3 2050-360	2050	25	30	33	360	330	195	4510	2060	2050	1510	1060	12640	30	360	600
HR-3 2050-400	2050	30	35	38	400	350	165	4510	2060	2050	1490	1060	13400	37	360	600
HR-3 2050-430	2050	35	40	44	430	380	135	4510	2060	2050	1475	1060	14300	45	360	600
HR-3 2550-200	2550	4	6	7	200	180	90	4330	1160	1180	840	665	3800	7.5	200	160
HR-3 2550-210	2550	6	8	10	210	190	80	4330	1160	1180	835	665	4000	7.5	200	160
HR-3 2550-230	2550	8	10	12	230	200	70	4330	1160	1180	825	665	4350	11	200	160
HR-3 2550-270	2550	10	13	15	270	250	140	4760	1660	1590	1155	800	7550	15	270	400
HR-3 2550-300	2550	13	16	18	300	270	115	4760	1660	1590	1140	800	8200	18.5	270	400
HR-3 2550-330	2550	16	20	22	330	290	90	4760	1660	1590	1125	800	8900	22	270	400
HR-3 2550-360	2550	20	25	28	360	330	195	5010	2060	2050	1510	1060	12380	22	360	600
HR-3 2550-400	2550	25	30	33	400	350	165	5010	2060	2050	1490	1060	13300	30	360	600
HR-3 2550-430	2550	30	35	38	430	380	135	5010	2060	2050	1475	1060	14500	37	360	600
HR-3 3100-210	3100	4	6	7	210	190	80	4880	1160	1180	835	665	4500	7.5	200	160
HR-3 3100-230	3100	6	8	10	230	200	70	4880	1160	1180	825	665	4800	7.5	200	160
HR-3 3100-270	3100	8	10	12	270	250	140	5310	1660	1590	1155	800	8280	11	270	400
HR-3 3100-300	3100	10	13	15	300	270	115	5310	1660	1590	1140	800	9200	15	270	400
HR-3 3100-330	3100	13	16	18	330	290	90	5310	1660	1590	1125	800	9850	18.5	270	400
HR-3 3100-360	3100	16	20	22	360	330	195	5560	2060	2050	1510	1060	14900	22	360	600
HR-3 3100-400	3100	20	25	28	400	350	165	5560	2060	2050	1490	1060	16150	30	360	600
HR-3 3100-430	3100	25	30	33	430	380	135	5560	2060	2050	1475	1060	17700	37	360	600
HR-3 4100-270	4100	4	6	7	270	250	140	6310	1660	1590	1155	800	9710	11	270	400
HR-3 4100-300	4100	6	8	10	300	270	115	6310	1660	1590	1140	800	10600	11	270	400
HR-3 4100-330	4100	8	10	12	330	290	90	6310	1660	1590	1125	800	11780	15	270	400
HR-3 4100-360	4100	10	13	15	360	330	195	6560	2060	2050	1510	1060	17200	18.5	360	600
HR-3 4100-400	4100	13	16	18	400	350	165	6560	2060	2050	1490	1060	18900	22	360	600
HR-3 4100-430	4100	16	20	22	430	380	135	6560	2060	2050	1475	1060	21200	30	360	600

The mentioned values above is only works for 260 N/mm²
 Different material and widths ; can be calculated with AKOMAC Roll Bending Calculator
 Conic bending capacities depends on the angle and half value of mentioned values above
 Weight and motor powers may increase with optional features.
 Due to ongoing product development, specifications may change at any time

Larger or Custom
Machines Available



HR-3

STANDARD

- Planetary type side roll movement.
- PLC Electronic balancing system
- Cone bending
- Induction hardened rolls (HRc 56±4)
- Polished rolls
- Single speed control of all axis
- Machine body constructed of stress-relieved
- Highly durable carbon steel rolls machined by CNC Lathes with optimal crown (special crown upon request)
- Rolls seated in spherical bearings and bronze bushings
- Hydraulic bracket (drop end) with easy pull out system
- Top and side rolls driven with hydraulic motor and planetary gear box
- Automatic rolls peripheral speed compensation (optimum distribution of torque)
- Emergency stop wire around the machine
- Electrical and hydraulic protection against overloads
- World standard electrical and hydraulic components
- Mobile control panel
- Manual lubrication
- Welding possibility on the machine

OPTIONAL

- NC Unit (Teach and Play)
- AISI 4140 High strength alloy steel rolls
- Oil cooler
- Oil heater
- Side support system (both sides)
- Vertical hydraulic overhead support system 4, 6, 8 TON (10' - 14' - 16' - 20' tall)
- Preparation for side or vertical support system
- Plate alignment unit
- Changeable top roll for smaller diameter
- Special roll crowning
- Special plate support systems
- Automatic central lubrication
- Material feeding table (Idle or motorized)



A KOMAC

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