



MACHINING LARGE RINGS WITH IBARMIA

IBARMIA C SERIES PROGRAM

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It is not an easy task to find specific machines for niche market applications, as the low demand makes them unattractive for the manufacturers to develop specific solutions of high technology. IBARMIA has faced this issue and proposes a complete range of solutions for the machining of rings of big dimensions, up to a diameter of 8 metres, becoming one of the manufacturing leaders for this niche market.

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C SERIES MACHINERY PROGRAM



IBARMIAs activity had its origin in the manufacturing of industrial drilling machines following new technical developments and constantly improvements started producing high productivity machining centers since 1986. It is from 1998 when both lines come together in this natural step that combines all the knowledge acquired during more than 40 years building drills and another three decades dedicated to the development and manufacture of high-performance machining centers, a rich baggage that added to the engineering capacity and the flexibility of construction has made IBARMIA a leader in the machining of large flanges and bearings up to 8 meters in diameter.

C SERIES MAIN FEATURES

1_ RING IN HORIZONTAL POSITION

IBARMIA solutions respect the morphology of these parts, which are much better placed in a horizontal position. This way the part is placed on a central rotary table which indexes the exact degrees between centres of adjacent holes. The rotary tables are manufactured in-house using bearings or hydrostatic supports depending on the diameters and weights to be placed on them. In both cases a double pinion gear system triggers the dented crown generating the turning underneath the rotary table. The positioning accuracy is guaranteed thanks to a high accuracy encoder in the turning axis of the table.





2_FIXTURING DEVICES

Customers of these applications need more than just a machine, need a complete solution; therefore it is essential to solve piece fixturing issues. During 25 years of experience, IBARMIA has developed various types of self centering fixturing devices, manual and automatic. The flexibility and simplicity to change jaws and support positions for pieces of different diameters is something that has a clear impact on productivity which is highly valued by our customers.



IBARMIA incorporates the most advanced tool wear monitoring systems. The automatic tool magazines allow the management of twin tools and a more autonomous use of production. Ensuring the process avoiding down times caused by broken tools is crucial in this application.

4_WORKING AREA ENCAPSULATION AND COOLANT THROUGH SPINDLE

Using tools with hard metal inserts to turn or drill/tap deep holes requires coolant through the spindle for two main purposes, reducing the high temperatures generated in the drilling process and using the pressure to push the chips out of the inside of the hole.

High pressure pumps (up to 70bar) are used for this purpose which combined with high feed rates, push chips with great violence so it is recommended to encapsulate the entire machine to prevent chips and coolant coming out of the working area.

5_AUTOMATIC CHIP EVACUATION

Evacuating the high volume of chips generated during the machining process is a great challenge for every manufacturer, especially when it comes to big dimension machines of intense use (usually 3 shifts). With this purpose, our design avoids flat surfaces where chips could settle and favour their fall to the central channel where the paddles that turn with the rotary table push the chips to an external evacuator.





C SERIES MACHINERY PROGRAM



C SERIES SOLUTIONS

A complere range of solutions for machining big flanges and bearings up to Ø8.000 mm. Either in portal type machines or moving column machines, IBARMIA provides integral solutions (machine and clamping systems for large diameter rings).



DRILLING CENTERS





Portal Structure

One or two RAM in portal construction, which allow to cover any range of work from the center of the table to **maximum diameter ø8000 mm.** [



Portal Structure

Drilling centers with one or two heads in portal construction, which allow to cover any range of work from the center of the table to a **maximum diameter ø8000 mm.**



Moving column structure

Drilling center with one or two heads facing each other based on a mobile column structure and a central rotary table for circular pieces of **maximum diameter ø6000 mm.** 06

TURNING CENTERS

Portal Structure



Max. workpiece diameter ø 8.000 mm Max. workpiece height

1.050 mm

Since 2010 the range of solutions has been extended with high performance lathes specific for this application. For work pieces over 3500mm in diameter, the IBARMIA TURNING CENTER is made of a portal structure with cast iron bodies and rotary tables on a hydrostatic support. It is usually equipped with a double RAM although the machine can also be provided with a single RAM.

Prioritising the rigidity of the machine, we have chosen a fixed cross bar with a RAM stroke up to 1500mm for work pieces up to 1050 height.

Selection of manual clamping systems with independent or self-centering jaws as well as self-centering automatic or magnetics clamping devices.

Wide range of options for tool or turning turrets changing, from manual tool holders to automatic tool change using a CAPTO or KM system.

We find the top level of the range in the MULTIPROCESS series, where we add live RAMS to the high performance lathes so we can execute operations that were in the past, impossible to do in one single machine. Apart from turning operations, the machine can also do drilling, tapping, milling, boring and even grinding operations. The machine incorporates tool and head changes to support its versatility. Due to our extended experience in this application, IBARMIA can advise on layouts

of circular piece machining plants, piece handling and transportation, centralised chip evacuation systems....making us the perfect technological partner for the companies of this industry.



RAM Type 1 Size: 320x320 / 400x400 mm Stroke: 600-1500 mm

Turning turrets



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RAM Type 2 Size: 320x320 / 400x400 mm Stroke: 600-1500 mm

Live spindle



Spindle heads Automatic heads change system

Turning / Milling / Drilling / Threading / Boring / Grinding











One head

Max. workpiece diameter ø 8.000 mm Max. workpiece height 600 mm

The IBARMIA DRILLING CENTER was developed to avoid that situation as the portal construction allows covering every range from the centre of the rotary table to the limit of the axis at the end of the cross bar.

Once again we use a central rotary table underneath a fixed cross bar portal type construction where we can install either one or two spindle heads.

Vertical operations executed with V CLASSIC (Belt & Pulley transmission) or V EXTREME (electro spindle transmission). When horizontal operations are required it is possible to install a H EXTREME spindle head, equipped with an electro spindle and a tilting range of +/-105° becoming in an ideal solution for in-out and out-in drilling and tapping operations. It is possible to combine H EXTREME head with a V CLASSIC or V EXTREME heads. It is also possible to use angular heads directly placed on the tool holder.



V CLASSIC Vertical head

Belt & Pulley



V EXTREME Vertical head

Electrospindle



H EXTREME B axis tilting head

Electrospindle







Moving Column Structure



Max. workpiece diameter ø 6.000 mm Max. workpiece height 350 mm

The IBARMIA MOVING COLUMN DRILLING MODEL is designed for high productivity of heavy pieces due to its high load capacity rotary tables, automatic clamping fixtures, tool and head magazines and powerful spindles. One single head or dual confronting heads for vertical and / or horizontal drilling / taping operations. The basic model V CLASSIC (Vertical spindle head with belt & pulley transmission)) or HC EXTREME (Automatic vertical/horizontal tilting spindle head equipped with an electro spindle) make the basic range at IBARMIA.

Components fixed around a rotary table make an efficient drilling centre. The machine is made by a transversal axis generated by the column to adjust to different diameters and a vertical axis generated by the V CLASSIC spindle head. The HC EXTREME version with a vertical /horizontal tilting spindle head is recommended for horizontal drilling works such as the hole for ball introduction and the drilling and tapping of the holes used to grease the bearing tracks. The addition of a second column and spindle head to the previous range gives place to the dual version. This time there are 2 spindle heads working simultaneously on the same part. The machine can be configured with 2 V CLASSIC vertical spindles heads, with a V CLASSIC spindle head and a HC EXTREME as well as 2 HC EXTREME heads. In case of having an odd number of holes or a variable distance between holes, the columns can be equipped with an intermediate saddle that generates an additional axis. On this moving column drilling centers, the range of covered diameters is limited by the jig, distance between the spindle centre and the guides of the vertical axis, making it impossible to reach the centre of the rotary table for rings bigger than 2 metres diameter.



V CLASSIC Vertical head

Belt & Pulley



HC EXTREME Universal head over 45° plane

Electrospindle













Diego Umantsoro Kalea 6, Apdo. 35, 20720 Azkoitia (Gipuzkoa) Spain. T + 34 943 857 000 - 130 F + 34 943 857 005 ibarmia@ibarmia.com www.ibarmia.com

