# DEALER BOOK MILLING TECHNOLOGIES



LAGUN

### LAGUN Forever

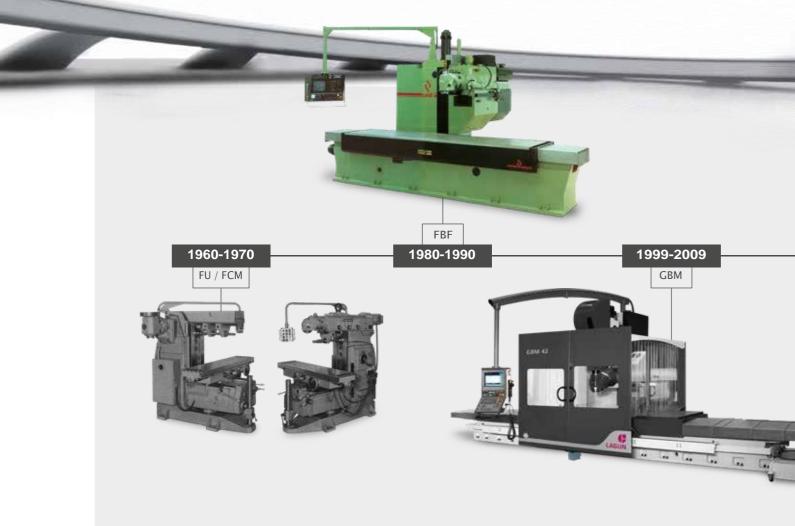
#### More than 60 years developing milling technologies

# **LAGUN Forever**

Since the first LAGUN universal milling machine was manufactured in 1956, more than 60 years have gone by during which we have developed a wide range of possibilities in milling technology.

Our aim is to design and manufacture medium-sized, reliable and competitive milling machines.

Our commitment to trust and reliability is based on close ties with our sales network and customers.



### **MAHER HOLDING**

#### We are part of the Maher Holding Group

**MAHER HOLDING** is a group of companies providing value-added services to the machine tool sector with a broad portfolio of simple solutions for complex market needs. Solutions based on robust technology, tested and designed with ease of use and flexibility in mind.

The collective capabilities of the product brands **GEMINIS**, **LAGUN**, **GMTK** and **ADDILAN** and service brands **ATERA**, **INTERMAHER** and **MEKALERUN** focus on delivering a high degree of specialisation as well as agile design and streamlined implementation of innovative models.

www.maherholding.es



LAGUN

LAGUN

#### Stable machines.

- Better rigidity.
- Customers with the 3rd generation of LAGUN machines.

AGUN

- Highly cost-effective technological solutions.
- Durability.
- High customisation.

- Flexible Configuration.
- Robust and tested milling machines.
- Solid and precise technology, avoiding superfluous details.
- Technological solutions aimed at the precise needs of the application.

СМ

ТΜ

2009-2021

MM

BM

Compact and flexible configuration

#### **Compact Draw**

# **Compact Draw**

**LAGUN's** technological configuration uses the same structural parts (slide, ram and column) complemented with a modular build-up of the milling machines of all our machine range (BM/L - CM/L - MM/L - TM/L).

Basic elements are used according to specific customer requirements, allowing for different machine, bed and table architectures. This working method enables us to build milling machines with a **fixed bed, travelling column with fix bed, moving column and cross moving column.** 

# BENEFITS OF THE COMPACT DRAW CONFIGURATION FOR THE CUSTOMER

### COMPACT AND FLEXIBLE CONFIGURATION

Our milling machines are designed by finite elements that confer rigidity, precision and working comfort to our machines.

**Increased flexibility.** Speed in configuration and manufacture of the milling machine. **Greater reliability.** Repeated use of standard structural parts offers enhanced reliability due to continuous improvements.

**Customisation.** Greater degree of adaptability by configuring different structural elements.

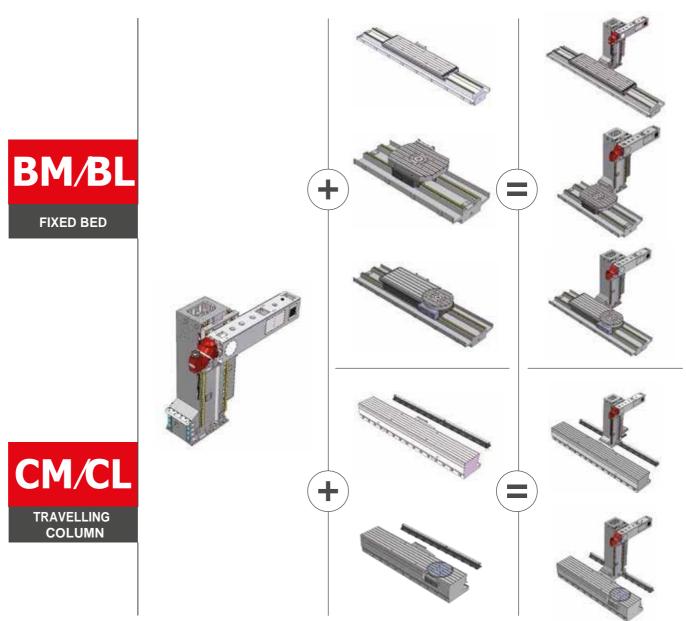
**Greater robustness.** Design optimisation coupled with lean and simplified repetitive manufacturing results in increased robustness of the milling machines.

**Easy maintenance.** No superfluous elements, and thus easier maintenance. **Greater precision.** Optimal configuration of slide-ram and roller-shoes to avoid imprecisions.

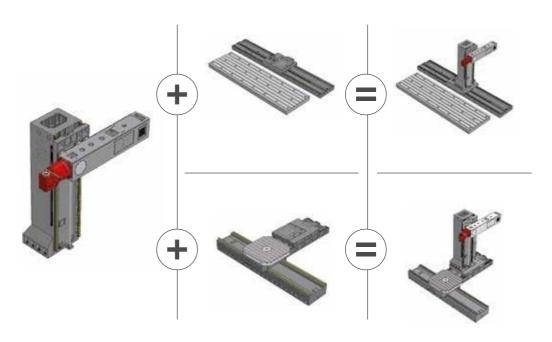
MODEL	X -AXIS TRAVEL	Z-AXIS	TRAVEL	Y-AXIS TRAVEL	
BM	78.74"/ 118.11"/ 157.48"/ 196.85" (2000mm/3000mm/4000mm/5000mm)	59.06"/ 78.74" (1500mm/2000mm)	- Same Y–Z slide - Same column	51.18" (1300mm)	· Same ram
СМ	157.48"/ 236.22"/314.96"/ 393.70"/ 472.44" (4000mm/6000mm/8000mm/10000mm/12000mm)	59.06" / 78.74" (1500mm/2000mm)	- Different assembly	51.18" (1300mm)	
BL	78.74"/ 118.11"/ 157.48"/ 196.85" (2000mm/3000mm/4000mm/5000mm)	78.74"/ 98.43" (2000mm/2500mm)	- Same Y–Z slide - Same column	59.06" (1500mm)	· Same ram
CL	157.48"/ 236.22"/314.96"/ 393.70"/ 472.44" (4000mm/6000mm/8000mm/10000mm/12000mm)	78.74"/ 98.43" (2000mm/2500mm)	- Different assembly	59.06" (1500mm)	

MODEL	X -AXIS TRAVEL	Z-AXIS TRAVEL		Y-AXIS TRAVEL		V-AXIS TRAVEL
ТМ	78.74"/ 118.11"/ 157.48" (2000mm/3000mm/4000mm)	59.06"/ 78.74" (1500mm/2000mm)	- Same Y–Z slide - Same column	51.18" (1300mm)	· Same ram	39.37"/ 59.06" (1000mm/1500mm)
ММ	157.48"/ 236.22"/314.96"/ 393.70"/ 472.44" (4000mm/6000mm/8000mm/10000mm/12000mm)	59.06"/ 78.74" (1500mm/2000mm)		51.18" (1300mm)		
TL	118.11"/ 157.48" (3000mm/4000mm)	98.43"/ 118.11" (2500mm/3000mm)	- Same Y-Z slide	59.06" (1500mm)	· Same ram	39.37"/ 59.06" (1000mm/1500mm)
ML	157.48"/ 236.22"/314.96"/ 393.70"/ 472.44" (4000mm/6000mm/8000mm/10000mm/12000mm)	98.43"/ 118.11" (2500mm/3000mm)	- Same column	59.06" (1500mm)		
MLX	157.48"/ 236.22"/314.96"/ 393.70"/ 472.44" (4000mm/6000mm/8000mm/10000mm/12000mm)	98.43"/ 118.11" (2500mm/3000mm)		59.06" (1500mm)	· CAC ram	

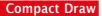








#### **System Configuration**



# Column - Slide - Ram

The slide-ram system is conceived to yield the best possible dynamic feed and acceleration while maintaining excellent stability in the whole travel and along the time.

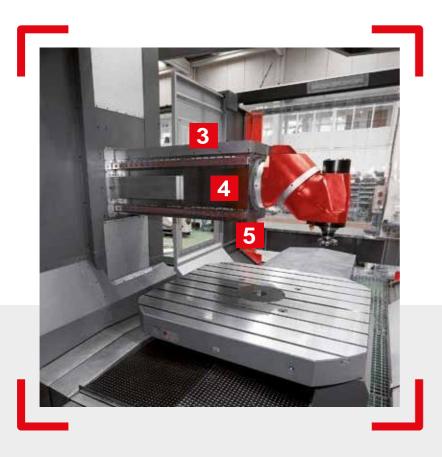


1. Ram guided with two parallel lateral guideways with locked roller-shoes for an optimal behaviour of the whole assembly as only set.

Design studied and calculated by **LAGUN**, in which the roller-shoes exceed the reliability factor required by the manufacturer for correct operation.

**2.** A rigid and light slide for vertical movements. Designed to place the ram as close as possible to the column to secure a sturdy column-slide-ram assembly.





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**3.** Placing the guides on the side enables the use of a system with milledto-measure wedges to correct the ram deflection (the so-called banana effect).

These wedges are placed between the guide and the ram to ensure optimal performance of ram precision in cross movements.

- **4.** The two guides and the roller-shoes are locked in position to increase rigidity and reduce the risk of them moving during heavy-duty machining, collisions, etc.
- **5.** Ram guides on the side. No guides have been placed below the ram to prevent possible collision with the workpiece. A collision can damage the guide and lead to breakage of the roller-shoes, scratches in machining...





### LAGUN'S NEW SERVICE. AS ALWAYS AND FOREVER.

**REMOTE-DIAGNOSTICS SERVICE** 





### Remote Real-time connection.

Our remote-diagnostics service is designed to solve possible incidents remotely, quickly and safely. A back-up specialist technical support team providing expert and personalised advice is at the disposal of the client at all times.

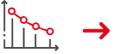




### On-site repairs.

In the event on-site repairs are required, a remote diagnosis also enables optimum preparation of the technical team in advance to deal with the incident in the most effective way. Time saving and efficient repairs translate into major cost savings and a better customer experience.

### **ADVANTAGES**









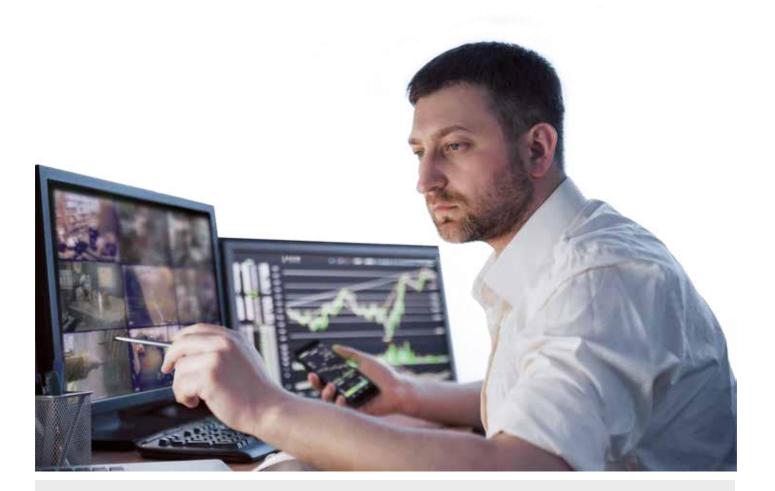


Increased machine availability



### **PREVENTIVE MAINTENANCE**

In LAGUN we are developing an optimal system for remote data capture specifically geared towards preventive maintenance.



At **LAGUN**, we can monitor each machine with verification and inspection protocols resulting in detailed reports on the machine status. With the information of these reports, LAGUN proceeds to implement the necessary corrective measures for each machine.



### Advantages of a preventive maintenance plan:

- Reduced need for corrective maintenance.
- Cost savings.
- Reduced downtimes in case of repairs.
- Enhanced management of spare parts stock.
- Longer lifespan of equipment and spare parts.
- Higher production output.
- Increased operator safety.

#### Bed type milling machines

# **BM-BL**

The **LAGUN BM-BL** is a universal milling machine with a compact and robust design, created to offer application-oriented, technological solutions offering high profitability.

The **BM-BL** series is a machine with fixed bed and movable table with longitudinal travels: X: 78.74", 118.11", 157.48", 196.85", (236.22"). (2000mm, 3000mm, 4000mm, 5000mm, (6000mm)).

The **BM-BL** milling machine has been designed with roller guides for axes movements:

- High **dynamics**: Higher feed and acceleration.
- **High** positioning **accuracy** and repeatability.
- High rigidity in the Compact Draw configuration and its guidance.
- **High** dynamic and static **load capacity** results.
- Processes with high thermal stability securing accuracy over long periods of time.

### $\mathbf{Z}$

# Universal milling machine with compact and robust design:

• Oversized bed width. Sturdy, reinforced ribbing inside with finite-element design.

- Large-sized guideways placed at an optimal distance from each other for high load capacity on the moving table.
- Table width 43.31" (1100mm) on BM and 51.18" (1300mm) on BL. The table is guided by means of longroller-shoes, size 2.17" (55mm).

#### BM-BL



Size of guideways RUE 55 and optimum arrangement of roller-shoes for each X-travel.
The number of roller-shoes depends on the travel: 6 roller-shoes on BM 2, 8 on BM 3, 10 on BM 4 and 12 roller-shoes on BM 5.

As on the Y-axis, the X- and Z-axis guides and roller-shoes are locked. In addition to keep a correct alignment of the guide, this locking secures high absorption of lateral forces and high precision levels. This reduces possible vibrations that are transmitted to the slide, thus achieving high precisions.



### Optimal care in the design of chip and coolant removal.



The milling machine is equipped with channels around the bed perimeter, perimetral enclosure, double built-in chip extractor, with easy access to the machine and a perfect overview of the working area.

#### Bed type milling machine with rotary table

# BM RT

The **BM RT** machine is a bed type milling machine with a rotary table, C-axis; 4th axis.

### It has a compact and robust design:

Robust table 62.99" (1600mm) long and 47.24" (1200mm) wide, guided by long roller-shoes, size 2.17" (55mm).

- With a load capacity of 6 Tn.
- Tangential moment with hydraulically locked table 7375.62 ft-lb (10,000Nm). Locking by means of ahydraulically actuated brake calliper.
- Admissible torque during milling 7375.62 ft-lb (10,000Nm).



 $\mathbf{Z}$ 

### Optimal care in the design of chip and coolant removal.

The BM RT milling machine is equipped with channels around the bed perimeter, full enclosure, double built-in chip extractor, with easy access to the machine and a perfect overview of the working area.

Ideal machine for machining bulky workpieces on all 5 sides.

**BM RT** 



BM C

#### Bed type milling machine with integrated rotary table

# **BM C**

The **BM C** machine is a bed type milling machine with an integrated rotary table with a high load capacity on the rectangular table itself, suited for specific jobs.

### Always keeps compact and robust values:

- $\cdot$  Ø43.31" (Ø1100 mm) rotary table built in the table with a load capacity of 6 Tn.
- Complete table width 43.31" (1100mm).
- Tangential moment with hydraulically locked table 4425.37 ft-lb (6,000 Nm).

Admissible torque during milling 7375.62 ft-lb (10,000 Nm).

In the **LAGUN** range of bed type milling machines, the **BM C** milling machine model is really a combination of the usual **BM** bed type milling machine and a **BM RT** bed type milling machine with rotary table.



and rectangular flat table also with good load capacity at the same height. Workpiece machining is possible on both the complete table or on each one individually. With a longitudinal X-travel of 3, 4 or 5 meters.

**Versatility:** machine offering different milling possibilities, for long workpieces, workpieces requiring 5-sided milling, rotating workpieces, etc.

The milling machine is provided with an optimised working area and internal space for machining of different-shaped and sized workpieces, with excellent swarf and coolant removal.

The BM C design offers an ideal solution for machining a wide variety of workpieces.

Universal travelling column milling machine with fixed table

# CM - CL

The **CM** - **CL** machine is a universal milling machine with a travelling column and fixed table with a high load capacity. This type of machine enables machining of parts of up to 12 meters in length, virtually without any restrictions with regards to the weight of the workpiece as the slide-column set performs the longitudinal movement.

- **X-travel** from 4.37 yd to 13.12 yd (4 m to 12 m).
- **Table bed of 59.06" (1500mm)** more than the travel, so that the X-axis slide supporting thecolumn is always guided on the bed 64.37" (1635 mm in CL).
- Table width 43.31" (1100mm) on CM and 51.18" (1300mm) on CL.

The **CM-CL** milling machine enables pendulum working mode, i.e. two separate and independently protected working areas are available. Thus it is possible for the machine to operate in one area while the operator sets up the next workpiece in the adjacent area.

- **Front and side enclosure** fixed to the machine with two front doors with opening for the machine travel.
- **Control panel in cabin, suspended on an articulated arm** which can be **moved to the front** for work in manual mode or closer inspection. Optionally a double control panel can be provided: one fixed in the cabin and the other at the front sliding along the table bed.
- Machine solution for **machining long and/or bulky and heavy workpieces**. Also suitable for serial machining with Non-Stop system with pendulum work mode.



CM CL



The X-axis slide with the column moves on the bed-table, with two size 55 linear roller guideways at the front and supported by 6 roller-shoes with recirculating rollers (type RUSV) at the rear. Movement is by means of a double rack and pinion.

The bed-table is heavily ribbed on the inside every 19.69" (500mm), designed following the finiteelement method. It has a load capacity of 1228.9lbm/sq.ft. (6000kg/m<sup>2</sup>).



The CM C machine is a universal travelling column milling machine with fixed table with an integrated rotary table, with a high load capacity for specific jobs.

Ø 39.37" (Ø1000 mm) rotary table built in the table with a load capacity of 6 Tn.

The integrated table offers great versatility.

The **CM C** machine offers a wide range of machining possibilities on a wide variety of workpieces. And it is an ideal complement for working in pendulum mode with two different machining areas.

#### **Cross Moving Column Milling Machine**

# ΤM

The **LAGUN TM** machine is a cross moving column milling machine, V-axis, parallel to the ram movement, Y-axis, with rotary table, C-axis; with a compact and robust design.

It is designed for **machining large bulky parts** with high precision requirements. It consists of setting several relatively short travels which when combined secure optimum precision quality, as well as working with bulky workpieces, and also high loads on a robust and precise table.



- $\mathbf{Z}$
- Robust **59.06" x59.06"** (**1500mmx1500mm)** table, optionally 70.87" x70.87", (1800mmx1800mm), sliding on long roller-shoes, size 2.17" (55mm). With a load capacity of 10 Tn.
- Tangential moment with locked table 18439.05ft-lb (25,000 Nm). Braking system with hydraulic locking.
- **Permissible torque** during milling 10325.87ft-lb (14,000 Nm).

Optimal care in the design of chip and coolant removal. Channels around the entire bed perimeter, full enclosure, double built-in chip extractor, with easy access to the machine and a perfect visibility of the working area.

The TM milling machine is **the most intelligent machine solution for 5-sided machining** for workpieces with a wide variety of shapes and surfaces to be machined, where access iscomplicated. Combines Y-axis and V-axis.



ТМТ

### **Cross Moving Column Milling Machine with turning**

The TM T is a multi-process machine variant of the TM machine model. This is a cross moving column milling machine, V-axis, with rotary table, C-axis, with turning capability.

It is intended for performing several processes in a few workpiece set-ups: Milling – turning.

Robust and stable steel rotary table diameters 62.99" and 70.87" (1600mm and 1800mm) at the top.

Rotation speed rpm. of 400 rpm, and a torque of 6195.52ft-lb (8,400 Nm).

- Locking of the table is done by means of a hydraulically operated brake calliper.

The table is rotated by two servomotors 19HP (14Kw each) obtaining 38HP (28Kw) in two working ranges. Thetransmission system is with a double pinion gear allowing for a good positioning precision (withelectronic preload) and high revolutions.



### **[7**]

Optimal care in the design of **chip and coolant removal**. Channels around the entire bed perimeter, full enclosure (including roof), double built-in chip extractor, with easy access to the machine and a perfect visibility of the working area.

Included is a specific tool clamping system for milling and turning, such as HSK 100T or Capto C8. Also included is an Orthogonal head with Hirth System, the LO40 head, for locking the main spindle to allow turning operations. This head allows external turning of different profiles thanks to versatile tool positioning.

The TM T milling machine is LAGUN's multi-process machine proposal.

#### Floor type milling machines

# 

MM - ML

The **MM – ML LAGUN** machine aims to meet the needs of manufacturing bulky and complex shaped pieces during which flexible solutions to secure access of the tool to the machining area.

The universality of the moving column milling machine enables to conceive machines for a variety of applications with the main travel guided on a robust bed and with a large variety of workpiece set-ups elements.

The independence of set-ups or the tables, from the bed-column assembly, makes it possible to arrange these parts in a different way or dimensions, thus creating a distinct machine with each arrangement.



MM moving column milling machine, robust and stable design. With Z travels: 78.74" (2000mm), Y: 51.18" (1300mm).



The flexibility of this system allows very specific work options to be addressed.

#### Aimed at production:

- Pendulum work with preset divisions.
- Possibility of installing more than one column-slide-ram assembly on one single bed or on two beds facing each other.



#### Aimed at machining large parts:

Possibility of machining long lengths thanks to the double rack and pinion transmission on the X-axis.

• Possibility of machining bulky and/or heavy parts because the work movements do not depend on the location of the parts to be machined.

The line of longitudinal moving column milling machines manufactured by **LAGUN** has been conceived to offer optimal solutions to a demanding market.

**LAGUN** milling machines can also be equipped with many options and accessories according to customer needs. The different types of last generation heads are designed to enable the machining of workpieces with complex angles, difficult access and heavy-duty and precise machining in the entire work area

ML moving column milling machine, robust and stable design.With Z travels:

118.11" (3000mm),

Y: 59.06" (1500mm).

The **MM** - **ML** milling machines are fitted with a robust bed with ribbed reinforcement following the finite element method.

• The (X-axis) slide with the column (Y and Z axes) moves on the bed, with two size 2.17" (55mm) linear roller guideways supported by 2 roller-shoes with recirculating rolls (type RUSV) in the middle.Movement is by means of a double rack and pinion.

The X-slide holds the 8-long roller-shoes (MM) or 10 long roller-shoes (ML), size 2.17" (55mm), 2 roller-shoeswith recirculating rolls (type RUSV) and two independent motors for the X-axis movement.

Coolant and swarf are collected in the foundation on the floor. Safety guards and the enclosure are made to CE safety standards and customised to customer specifications.

### Floor type milling machine with automatic head change

# MLX

The LAGUN MLX machine is a moving column milling machine with Automatic Head Change.

Z dimension: 118.11" (3000mm) (and exceptionally Z: 137.80" (3500mm), Y: 59.06" (1500mm).

### Highly configurable machine to adapt to specific machining needs:

For machining bulky and heavy parts in various applications and machining needs with various types of heads.





The **LAGUN MLX** milling machine is the most customised solution to today's machining needs.

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LAGUN

### Floor type milling machine with automatic head change and boring capability

MLX O

# MLX Q

Moving column milling machine with Automatic Head Change and with a boring system.

BORING MACHINE.: Y dimension: 3000mm (118.11in.) (and exceptionally

Y: 3500 mm (137.80in.)), Z: 1500mm (59.06in.).

### N

Milling machine configured as a boring machine designed for milling and boring ofbulky workpieces on which precision is an essential requirement.

- With built-in Ø 5.12" (Ø 130mm) quill system. And W-travel: 31.50" (800mm).
- With a high-performance motor to achieve a power of: 70HP (52 Kw) (S1); Max. torque: 2360.20ft-lb (3,200 Nm) (S6).
- Linear position encoder for the W-axis.
- Precision of positioning: 0.001 mm.
- Positioning accuracy of C-axis: +/-3".
- · With a system integrated in the ram of the machine with high precision elements and temperature control during operation.
- Automatic main motor cooling system.
- Automatic cooling system for the quill housing.
- Automatic cooling system of the 2-speed gearbox.



The MLX Q machine is the LAGUN solution to milling and boring needs.

0

LAGUN MILLING HEADS

#### Heads

# New image, same quality

In its unwavering commitment to bring to the market cutting-edge products, LAGUN has restyled their head range to a more modern product line. While retaining the same functions and the same quality, the new design transmits a renewed image in keeping with the times.

- · More modern design line.
- Same functions as before.
- Same quality as always.
- · Competitive price.
- LAGUN guarantee and assurance, a company with more than 60 years of experience.

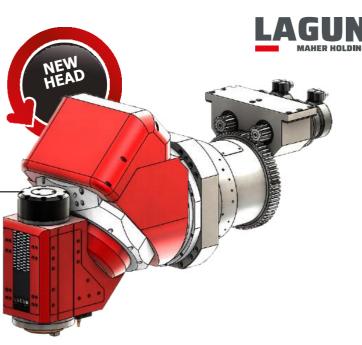
### **TYPES OF HEADS**





# The most cost-effective solution for versatile machining

- · Standard automatic head LU A, the most competitive on the market.
- Extremely cost-optimised thanks to continuous production.
- Hundreds of heads installed during its 20 years of manufacturing.
- · Head under constant improvement.
- Proven reliability and assured spare parts.



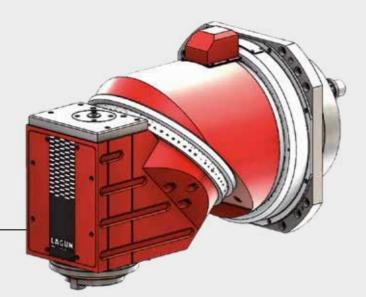
# The most competitive solution to today's machining requirements

LU S-C

**"THE BEST"** 

- Head with motorized rotation of the two
- bodies and positioning by means of high precision braking system and high locking capacity.
- $\cdot$  Simultaneous millesimal positioning and large removal rate in continuous rotation.
- Top quality design and elements for our millesimal motorised head.
- Fast, accurate, reliable, and robust.





The solution for high-speed machining while maintaining a mechanical drive head with a high removal rate. No other comes near!

- Mechanical drive head with high removal rate and 8000 rpm.
- The only one of its kind on the market. With a cooling system and stable temperature control by oil recirculation with flow variation depending on the revolutions at which it is operating. Long life of all rotating elements.
- · Compact headstock with super-tight dimensions to allow access to complex machining areas.

### **TYPES OF HEADS**

#### Heads

### LU 40 "THE BEAST"

### High-tech head for multiple requirements

- $\cdot$  LU 40 head with high performance and high removal rate.
- Hirth double differential coupling option with positioning every 0.0028°.
- Option to improve thermal stability by oil recirculation cooling of the head bodies and speed range box for prolonged machining at 4000 or 5000 rpm.
- Option for Automatic head changing.



### LO 40 "VERSATIL"

### Versatile automatic head

- High-performance orthogonal head.
- The best solution for many angular positions in different parts of the machining area.
- Hirth double differential coupling option with positioning every 0.0028°.
- Option to improve thermal stability by oil recirculation cooling of the head bodies and speed range box for prolonged machining at 4000 rpm.
- Option for automatic head changing.
- Option to prepare the head for turning on a multiprocess machine.



### LV "THE ROCK"

### Robust technology

- · Vertical robust head with high removal rate.
- Four bearing set nearest to the nose.
- Roller bearing nearest to the gearing.
- · High preload of bearings.
- S max.: 1,800 or 2,000 rpm depending on preload.





# LH 240 "DIRECT"

### **Robust technology**

- Highly robust horizontal head. Ø210 L 240, ISO 50.
- For horizontal machining (frontal).
- Option for automatic head changing.

## LH 650 "REACHER"

### **Reach technology**

- Highly robust horizontal head. Ø210 L 650, ISO 50.
- . Lightweight horizontal head. Ø130 L 650, ISO 40.
- · For access to internal machining areas and small diameters.
- Option for automatic head changing.





LH 650

LH 650-ISO 40

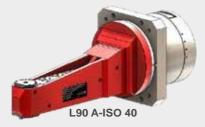
# L 90 A

### **Reach technology**

Angular head, L type, with automatic rotation of the body every 1°.

- · ISO 50 taper. S: 1800 rpm.
- Head dimension, height: 230 mm (9.06in.).
- · ISO 40 taper. S: 2000 rpm.
- Head dimension, height: 210 mm (8.27in.).
- Manual tool clamping.
- · Ready for automatic head change

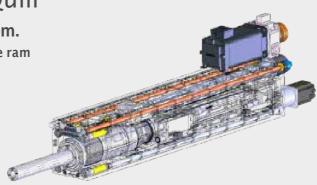




# QUILL - W-axis "Quill"

### Reach technology with boring system.

- High precision automatic quill integrated in the ram with high removal rate.
- · DIA 5.12" x 31.50". (130 mm x W 800 mm)
- · ISO 50. 3000 rpm.



Customisation

# Versatile solutions

At LAGUN, we always offer effective solutions that meet the specific needs of each client.

**LAGUN** milling machines are universal machines that are designed to perform a range of operations. Each machine is customised for each customer in order to offer a versatile solution.

Double control panel, operating panel position, pendulum work.





(Rotary-sliding table on the TM)



(Rotary-sliding table for MM, ML, MLX)

rotary-sliding tables, etc.

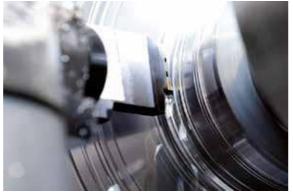


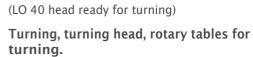


Magnetic tables, angle plates or clamping cubes.

(Angle plates on CM)









(Facing and boring head)





 $\mathbf{Z}$ 

(Inside of the BM with full enclosure) Enclosures, full enclosures, custom enclosures, etc.







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Would you like to find out more about **LAGUN** milling machines?

