



## **REX 1200 MS CNC**

**Crankshaft CNC  
Grinding Machine**



*Importing Reliable Grinding Machines*  
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## TECHNICAL SPECIFICATIONS

Max. distance between chucks	12000 mm
Max. grinding length	12000 mm
Height of centers over table	750 mm
Swing over table	1500 mm
Grinding diameter	50-500 mm
Steady-rest capacity	30-250 mm
Max. weight on steady rests	250-500 mm
	15000 kg

## TABLE LONGITUDINAL MOVEMENT - 'Z' AXIS

Stroke	12500 mm
Speed	0-8 m/min
Max motor torque	70 Nm
Resolution	0.0001 mm

## WHEEL HEAD CARRIAGE TRAVERSAL MOVEMENT - 'X' AXIS

Stroke	1100 mm
Speed	0-6 m/min
Max motor torque	70 Nm
Resolution	0.0001 mm
Handweel division	0.1-0.01-0.001 mm
Minimum grinding wheel speed	300 rpm
maximum grinding wheel speed	600 rpm
wheel motor speed	60 kW
Wheel maximum diameter	1600 mm
minimum wheel thickness	40 mm
maximum wheel thickness	150 mm

## WORKHEAD AND TAILSTOCK

External taper	15" ASA
Internal taper	100 metric
Rotation speed	20-60 rpm
Diameter 4 jaws independent chuck	800 mm
Clamping range	40-800 mm
Workhead motor power	20 kW

## DIMENSIONS

Length	18000 mm
Width	5000 mm
Height	2900 mm
Approx weight	86000 kg



## MACHINE DESCRIPTION

### BASEMENT

The grey cast-iron, torsion-resistant machine base has very good damping properties and the upper side is machined with large ground guides. The traversal movement driving system by rack and pinion and double backlash free gearbox is positioned in the middle of the base. The machine levelling is undertaken using the recessed cast pockets in the machine base. Standard levelling screws and plates are supplied along with the machine. It is suggestable to have a proper foundation.



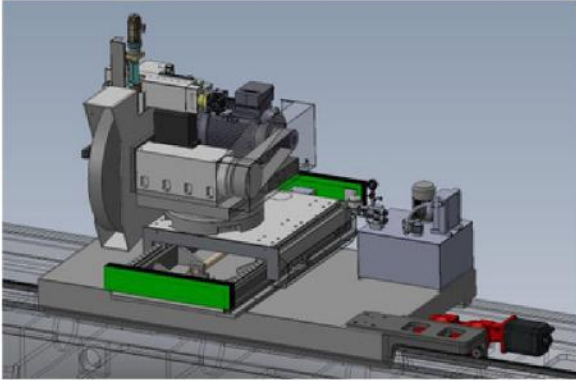
## GRINDING WHEEL CARRIAGE

Manufactured in one piece in normalised and stabilised frame steel. The movement of the carriage is by mean of hydrostatic guides that guarantee high rigidity and smooth movement even at very slow feeds. The longitudinal movement is obtained by rack and pinion wit double gear backlash free.

On the upper side are secured the wheelhead traversal slides.

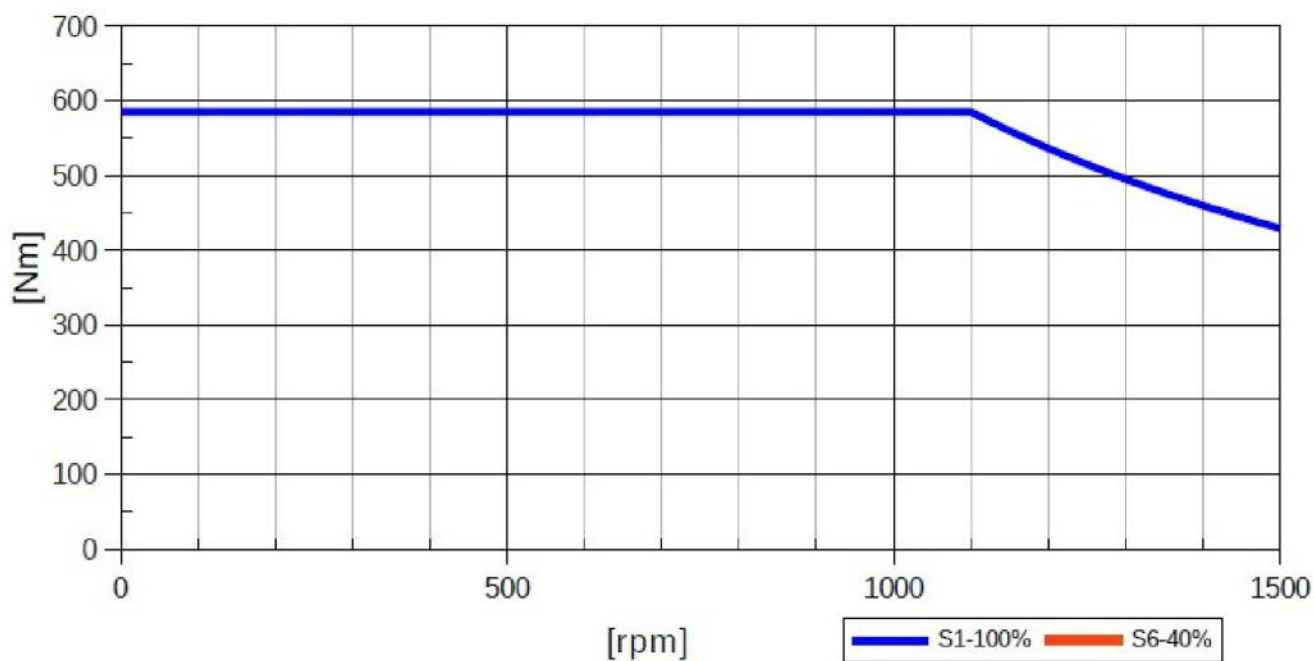
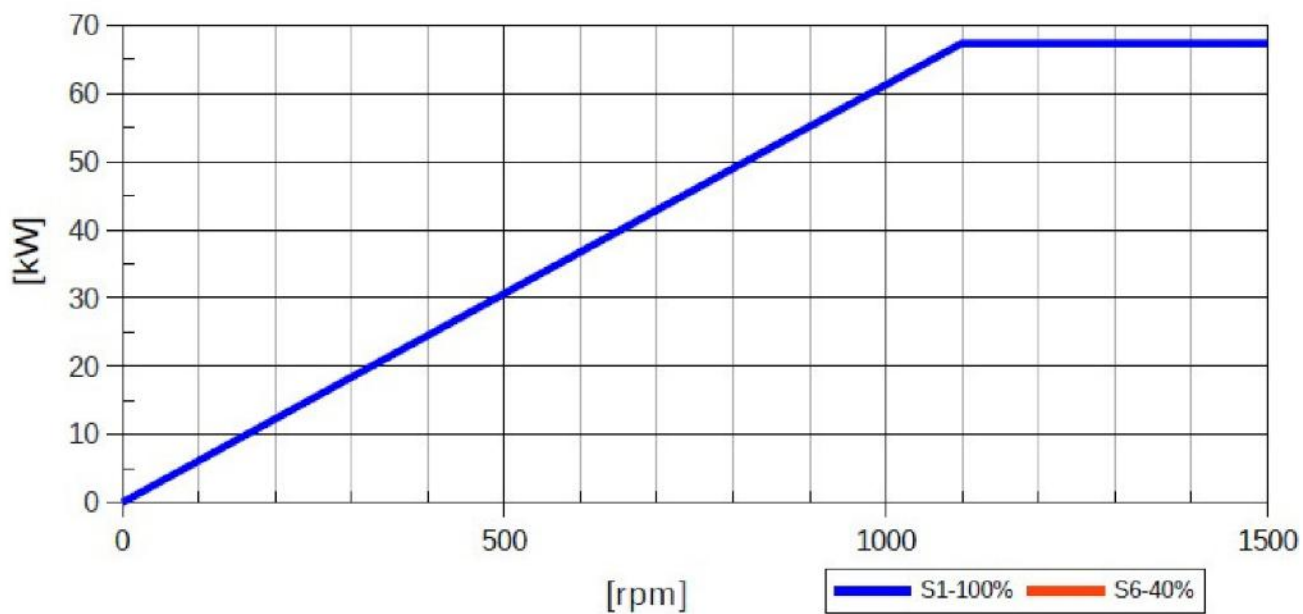
The wheel-head spindle support where the spindle is located, is constructed in cast iron.

The positioning accuracy is guarantee using the motor encoder and digital linear glass scale which controls in closed loop the position of the X axis.







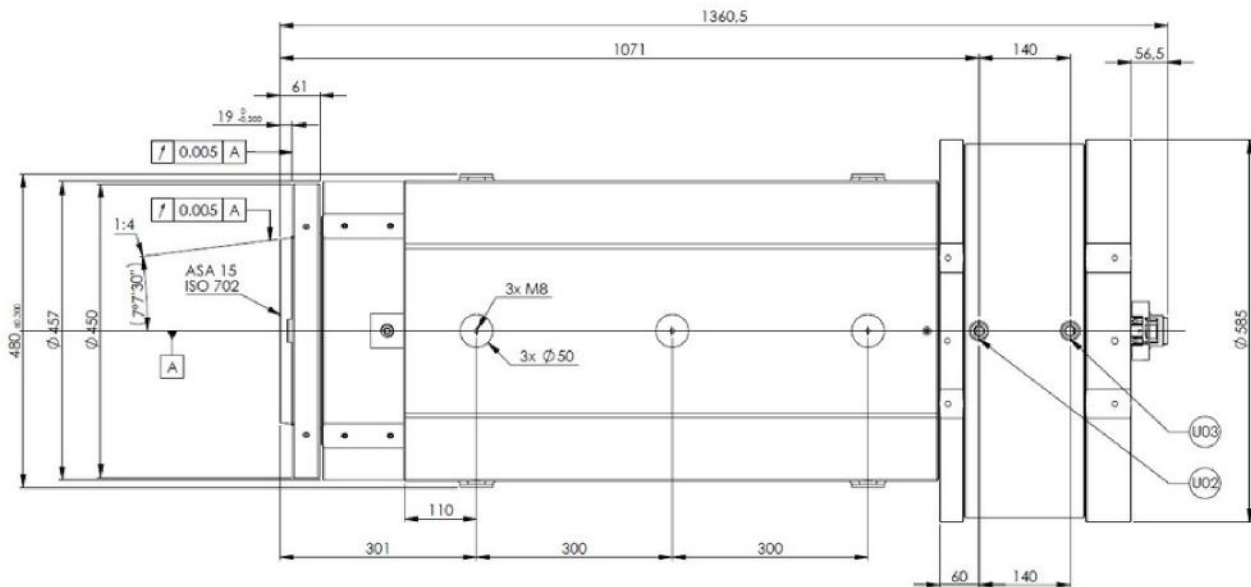


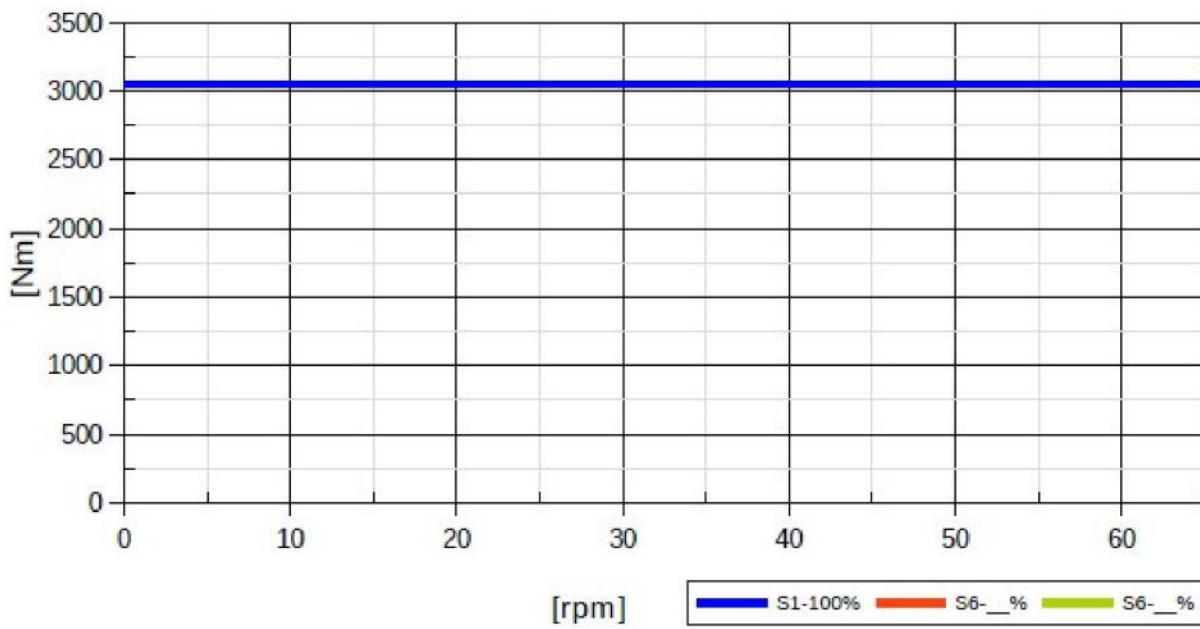
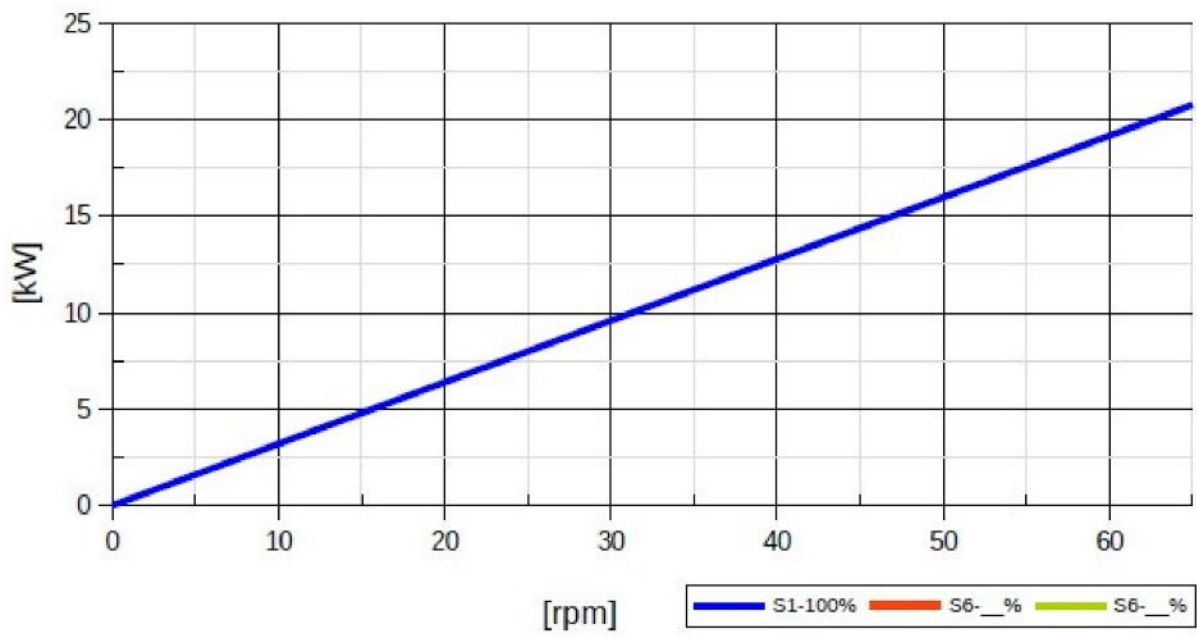
## WORKHEAD AND TAILSTOCK

The structure in normalised, stabilised and well ribbed cast iron, allows to support the workpiece weight and the force generated by the grinding operation.

Both workhead and tailstock spindles are driven by TORQUE motor with programmable speed. The motors on both heads can work simultaneously and the angular position is guaranteed by a high precision encoder. The workhead positioning on the table is facilitated by an air flow.

The tailstock side is equipped with a slide that helps the loading/unloading of the crankshaft between the heads. The housing of the heads is water cooled.







## STEADY REST

With the help of the steady rests it is possible to increase the weight capacity of the machine. The contact shoes are manually adjustable from the front side handwheels. Different range and sizes of steady rest are available. Hydraulic steady-rest are available on request.



## DIAMOND DRESSER

The rigid dressing unit device is positioned on the tailstock. The dressing tool may be positioned in three directions (straight or angled).

The dressing cycle automatically compensates the wear of the grinding wheel.



## CYRCUIT

Hydraulic plant: The hydraulic power pack, is separate from the machine and activates the hydraulic cylinder of the tailstock. It is equipped with an oil-air heat exchanger. Supplied without hydraulic oil.



LUBRICATION PLANT: The oil lubrication power pack, is separate from the machine and supplies continuous oil to the hydrostatic guideways and X axis screw.



PNEUMAT PLANT: This distributes the 'air cushion' to the wheel head and tailstock to assist with moving and positioning of the items.



COOLANT PLANT: The filtration unit is positioned in the rear side of the machine and is complete with:

- large capacity tank for the coolant water
- magnetic separator
- paper band filter
- electric equipment
- pump pipes and nozzles

The coolant flow is automatically controlled by the PLC program or manually from the operator panel.

On request is possible to equip the machine with a separate circuit for the cleaning and thermal stabilisation of the machine base.

Different filtration unit or mist extractor are available on request.



## PRECISION DEGREE

Robbi grinding machines are according to the international precision norms ISO 2433. The traversal wheel head movement is guaranteed by a max. deviation of 0,002 mm/mt.

Surface finish degree 0,2 Ra m.(\*\*)

The obtainable grinding roundness is :

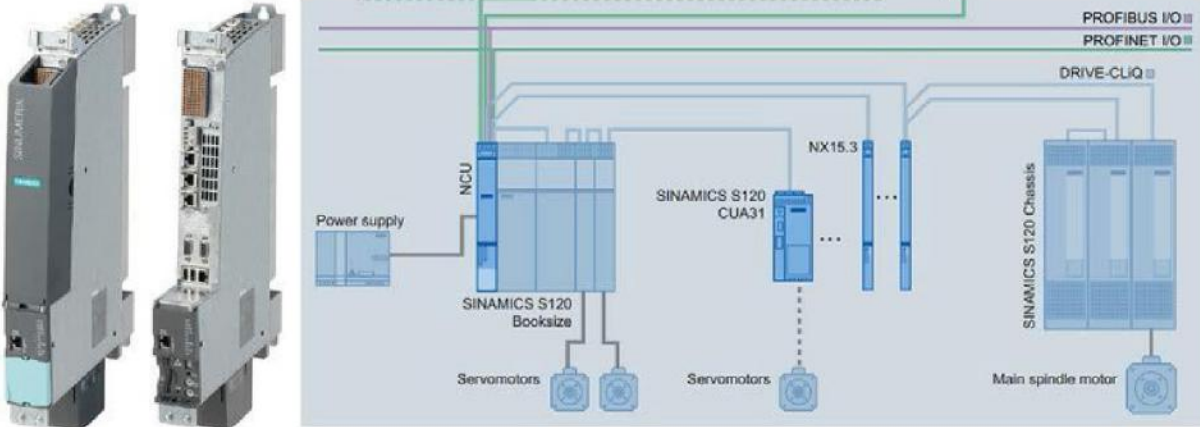
- Grinding between centers 0,8 m (\*\*)
- Grinding with live spindle 1,0 m (\*\*)

(\*\*) for a test workpiece ground in our factory during machine testing



## AUTOMATION

AXIS CONTROLLER : SINUMERIK 840D sl with FAN included and double Battery Module



**DRIVES:** the purpose of this device is to regulate and control the speeds of the electric motors of the axes and spindles to follow the trajectories defined by the Motion Control system.



**MOTORS:** The headstock and tailstock motors: are both direct drive type and water cooled to perform the maximum torque even at slow revolution speeds. They are driven by the CNC unit and controlled in position by an hi-accuracy direct encoder.

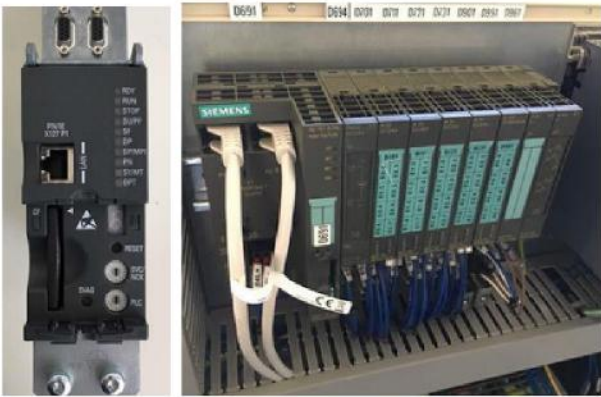
The wheel motor: The wheel head is equipped with an electro-spindle driven by a direct drive motor.

The axes motors: the main machine movements are driven by brushless A.C. servomotors type 1FK7 which are handled as axes by a SIEMENS SINAMICS S 120. The 1FK7 and motors are permanent-magnet synchronous motors with very compact dimensions and an attractive design. Quick and easy installation of the motors is possible because of the proven cross profile. These motors satisfy the highest demands on the dynamic response, speed setting range including field weakening, radial eccentricity and positioning accuracy. They are equipped with the latest encoder technology and optimized for operation on our completely digital drive and control systems. (For detailed powers and rpm, please refer to the motor list).





PLC: It is the unit dedicated to check the machine's operating conditions, managing safety and executing commands through the output signals. The PLC can also detect the operating conditions (state) of the machine through the signals coming from the sensors connected to the analog and digital peripheries. The PLC is connected via the Profinet network to all the CPUs; it is also directly connected to the CNC via an internal BUS



HMI: SINUMERIK OPERATOR PANEL OP 015 BLACK, 15" LED MULTITOUCH UND AND CAPACITIVE KEYS



Figure similar

Realo	Residua	Programata	Ultatino
X -385.888 mm	8.888 X	37.888 mm	X 8.888 mm
Z -58.248 mm	-193.852 Z	8.888 mm	Z 8.888 mm
B	grd		
A	grd		

NUMERO FASE	1
CICLO IN CORSO	PASS
INCREMENTO	0.005 mm
RUMAZ. PROGRAMMADO	888.888 mm/min
GIRI PROGRAMMADO	68 giri/min
PEZZI PER DIMENSIONE TORIA	158 pz.
PROB. DI LAVORO	064188 PMS 11pl
Giri macchina (rpm)	888 RPM
Giri macchina (rpm)	2888 RPM
PROBING RES	8.888 mm
PROBING RES	1.888 mm





**HANDWHEEL:** it is located on the operator panel and has a 3 m spiral cable. It is useful for the setting-up operation such as diamond or workpiece reference. On the MPG it is possible to select the axis and the proper federate.



**TELESERVICE (OPTION):** Robbi offers to all its customers the option to enable internet Remote Service. With Remote Service, Robbi technicians can connect to each grinder PC within minutes to diagnose and resolve problems, recommend improvements, update software, perform training and gather other useful information to help Customers make the best use of the grinding machine. This possibility brings huge advantages both to the Customer and to Robbi. For the Customer, problems can be addressed very quickly and at a fraction of the cost. For Robbi it is a possibility to improve Customer satisfaction on its machines by resolving problems quickly and avoid sending technicians to the other side of the world for problems that can be resolved easily through a remote internet connection



## SOFTWARE

The CNC controls:

- Wheel head traversal movement (AXIS X)
- Wheel head carriage longitudinal movement (AXIS Z)
- Work head spindle rotation speed
- The interpolation between the work head spindle rotation and the X axis (C-X axis interpolation)

The available programs permit the programming of the following grinding cycles:

- Plunge
- Cylindrical pass

The software for the workpiece grinding operation is very simple and intuitive.

While the program is in execution, it is possible to intervene and modify in real time the technologic parameters, such as: increments, dwell inversion times, spark-out passes. It is also possible to override the automatic pass grinding cycle with the handwheel.

## SAFETY

The machine safety is obtained by a master unit able to control all the safety inputs and interlocks  
It is equipped with

8 digital inputs

4 inputs for Start/Restart interlock and external device monitoring (EDM)

4 single OSSD or 2 pairs (PNP 400 mA)

4 status outputs (PNP 100 mA)

4 test outputs

The master unit is also able to control any other expansion unit



## ELECTRICAL EQUIPMENT

The electrical (IP 55) cabinet is separate from the machine. The cabinet houses all the electrical / electronic components CNC control, axis motor controllers etc. The operator panel is assembled on a dedicated cabinet separates from the machine.





## AUTOMATIC BALANCING AND GAP ELIMINATOR (OPTION)

It is possible to equip the machine with an automatic balancing unit that permits the reading of the un-balance of the grinding wheel and automatically correct it. This operation is achieved without dismantling the grinding wheel from the spindle, reducing the time for this process and increasing the health and safety caused by the handling risk.

It is possible to integrate the system with a GAP-CRASH eliminator sensor that permits to sense the contact between the grinding wheel and the diamond tool or the shaft.

This permits the operator to focus on the process during the presenting and the whole dressing or grinding operation.



## CONTROLLO DI MISURA E ROTONDITÀ (OPZIONALE)

The grinding machine may be equipped with an *in-process* measuring gauge made by MARPOSS with FENAR-L gauges and electronic P7.

Fenar L is the ideal solution for all diameter checking applications on modern crankshaft grinders. Designed to satisfy the requirements of gauging systems integrated in the machining process, it combines:

- Excellent metrological performance. Thanks to its auto-reference gauging system, the gauge is very accurate and has a large diameter measuring range.
- Total flexibility. The simplicity of the design and applicability confirmed by results in the field guarantee Fenar L absolute flexibility for use on orbital grinding of crankshafts.
- Reliability. The materials used in the Fenar L gauge are the result of over fifty years Marposs experience as the leader in the sector for gauges on grinders. The materials chosen reduce the effect of pressure, temperature and aggressiveness of the coolants used on this type of machining.

*The gauges have a measuring range of 25 mm*



### Roundness check (optional)

Checking the material to be removed before beginning the grinding cycle allows the grinding cycle to be adjusted to the measurement taken. Excessive out-of-round detected during finishing indicates abnormal bending on the part, steady rest pressure failure or a deterioration in grinding wheel cutting.

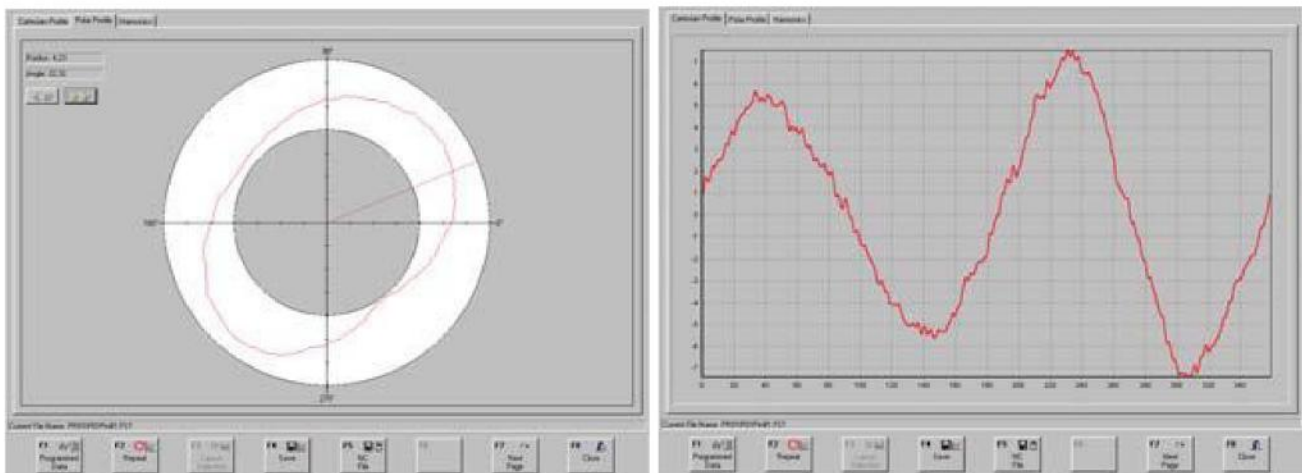
The real time check of measurement value detected during the cycle allows for intermediate spark-outs and/or wheel speed adjustment until the part is completely finished. This provides an economical method for maintaining high quality standards and reducing waste, making the process more efficient and productive.

If we exclude the shape error due to residual wheel imbalance, what remains is the systematic roundness error. The wheel imbalance can be corrected by using an automatic balancing system either integrated into the in-process gauge system or in an independent unit. The systematic errors must be measured and analysed in a metrology room to define their magnitude, origin and how to correct them. This takes time, since the parts must be studied off-line and involves unplanned machine down time if the cause of the error requires adjustment of the grinding machine.

Use of the Fenar L gauge in the machining process and the consequent sampling of measurements in a complete part revolution allows the diameter shape to be processed at the end of machining. This “save and process” part shape option lets you carry out a real time check on the development of the shape of parts being ground and make the necessary correction to the process.

This optional check further reduces the time needed to see a return on investment since, as well as the advantages typical of real type machining cycle checks, it significantly reduces shape error check times. Taking the measurement directly on the grinder, without affecting overall process productivity, immediately provides information about the roundness of the part machined, information that would otherwise have to be obtained by taking the part to a metrological room.

The shape check on the part(s) being ground can be carried out on the grinding machines processor or on a remote quality control work station. The system is easily integrated for automatic adjustment providing compensation data to the axis interpolation system according to the methods used by the machine CNC.



### MIDA AXIAL PROBE

The machine is equipped with a MIDA T25 probe that permits the acquiring of the angular starting position of the crankshaft.

The same probe permits the reading in Z direction and determine of the axial shoulders of the shaft.

