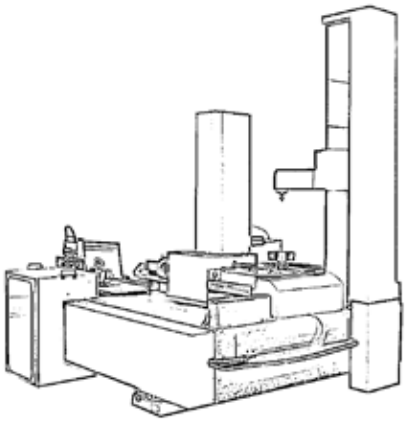
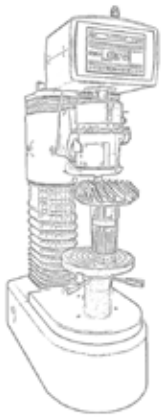
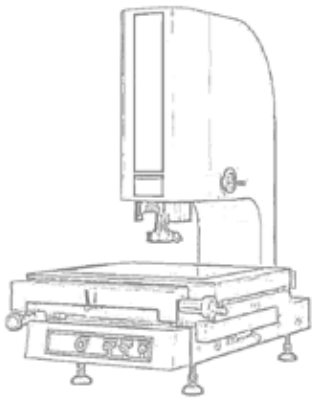
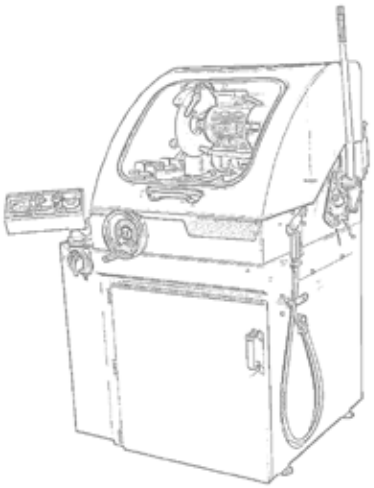
GEAR TESTING MACHINES









kiwa
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GEAR TESTING MACHINES

CRASE has been in gear's market for more than 30 years; today is able to *sell*, *assist* and *retrofit* testing machines for spur and bevel gears' measurement.
We face problems about **gears' control** thanks to our knowledge developed during years of fieldwork and thanks to today's technology, presenting a wide range of offers.

MANUAL GEAR MEASURING MACHINES

MAAG - KLINGELNBERG - MAHR - FRENCO - HOFLER

Manual machines, with or without base plate, are a worthy technical-economic option to measure gears. Once instruments have been retrofitted, they get efficient and updated. Our technicians are able to update your gear measuring machine of any brand and model, both CNC and manual. Beyond updating the measuring system, we can repair or inspect mechanical and electronical parts of your instrument.

The software is able to measure in compliance with DIN 3960 / 3962 AGMA, JIS, BS, ISO in order to meet any customer's requirement; measurement of the outside of spur gears and pinions.

Measurement types in basic packet "Gear Soft":
- Straight profile and helix (0°).
- Sloped profile and helix.
- Profile with release of tip and root.
- Calculation of crowning Cb Ca.
- Measurement of the K-Chart profile for preset ranges of tolerance.

Applicable to completely manual gear measuring machines with production of the involute profile through base plate or mechanical sine-bar. Installation of a measuring probe LVDT and two optical lines interfaced to a PC with dedicated electronics. The instrument can be calibrated and controlled with any standard master gear.

Maag PH-60, Klingelnberg-PFS-60,62,600, Hofler EFR 300, EFR 350, EFR 401, 401 MZ Golder Micron IL600, Karl Mahr 891T, David Brown 18T.

SEMI-AUTOMATIC GEAR MEASURING MACHINES

Measurement types in basic packet "Gear Soft":
- Straight profile and helix (0°).
- Sloped profile and helix.
- Profile with release of tip and root.
- Calculation of crowning Cb Ca.
- Measurement of the K-Chart profile for preset ranges of tolerance.

Applicable to gear measuring machines with motorised movement of the measuring axes for testing helix and involute, the system allows to increase and digitalise manual basic helix and, potentially, of the tailstock.

Maag PH-40,100, SP-60,100, Klingelnberg-PFSU 640,1200,1600, Hofler EFRS 401, EFRS 631, HFR 630.

CNC GEAR MEASURING MACHINES

Applicable to gear measuring machines with all motorised axes, interfaced to a programmable CNC movement controller. They perform a complete test of the gear with a totally automatic cycle for all the specified teeth. Gear Soft CNC offers the measurement of helix, profile and run-out charts and pitch measurement.

Klingelnberg PNC-33, PNC-40, PNC-60, Hofler EMZ 400,401,402,630,631,632, Hofler ZME 400, Hofler ZP 250,260,350,400, M&M.

Among CNC gear measuring machines we can find many instruments that range from 200 mm to 2000 mm diameter and completely automatic, which allows to measure in a fast and easy way. With only one measuring cycle, the machine provides a test report for the measure of helix, involute and division parameters.

Measurement types in basic packet "Gear Soft":
- Straight profile and helix (0°).
- Sloped profile and helix.
- Profile with release of tip and root.
- Calculation of crowning Cb Ca.
- Measurement of the K-Chart profile for preset ranges of tolerance.

Measurement types in CNC packet "Gear Soft":
- Error single pitch.
- Error adjacent pitch.
- Pitch variations.
- Error cumulative pitch.
- Division.
- Concentricity.

GEAR MEASURING MACHINES GMM

The **GMM gear measuring machines** series, thanks to customizable software packets for different applications, is suitable for performing a wide range of measurements in a completely automatic way. It is a metrological multifunctional system which is able to recognise and carry out the most frequent measuring software processes in the industrial sector.
The structure is made of three linear coordinate axes with pneumostatic support on granite tracks, that totally delete any friction and wear.
The placement of two tailstocks is provided, one of that is integral with the rotary axis (W) and the other one is opposite and height adjustable, mounted on a specific granite column. The control of the tailstock is motorised. This four-axes coordinate system is fitted for the placement of an analog measuring head which, with the use of a tracer, physically touches the sample's surface and tests the theoretical trend, made by a suitable interpolation created by the test, on the basis of the mathematic formulation implemented in software.

GMM gear measuring machines are able to measure:

- straight, helical and parallel gears
- splined gears with inner and outer involute profile
- pitch errors and concentricity
- thickness on k teeth
- crown and worm gears with harmonic analysis of the profile
- shaving cutters
- gleason/hypoid pairs with calculation of machine's parameters
- hobs, reverse engineering and other solutions.

SOFTWARE GEARSOFT

GearSoft is the basic software of GMM series and it is implemented by applications which allow to perform complete measuring cycles in compliance with standards ISO, DIN and AGMA.
The measure includes the detection of the distorsion of involute and helix, with the possibility to insert K charts on maximum four teeth, and the test of pitch error and concentricity and the thickness of the tooth.

GearSoft also allows to:

- print reports for the issue of trial certificates
- export and save files as PDF
- send data aimed to statistic analysis
- share acquired data, using the interconnection system compliant with the new regulatory standards.

Main features of GMM gear measuring machines

• SUPPORT BASE:

The structure lies on the floor through self-levelling pneumatic supports.

• GRANITE SURFACE:

It serves as sliding surface for the Y axis, as support base for the tailstock, and as a base for the rotary table.

• Y AXIS CARRIAGE:

It carries X and Z axes. It shifts on granite tracks with pneumostatic supports. The transduction system is made of high-resolution protected optical lines. The movement occurs through linear motor on a neutral axis..

• X AXIS CARRIAGE:

With pneumostatic supports on granite tracks.

• Z AXIS CARRIAGE:

With pneumostatic supports on granite tracks with pneumatic stabilizing system.

• ROTARY TABLE:

Pneumostatic support system, with a treated steel backing pad, with clamping grooves and interchangeable lower tailstock. The transduction system is composed by a high-resolution rotary encoder. The movement is performed by an electronic axis by means of a torque motor, with peripherical traction.

• TAILSTOCK:

Realised with a sliding track on a granite column, movement with automatic tailstock's preloading system. Device for thermal lengthening equalization with suitable anti-expansion joint.

• OPERATOR WORKSPACE:

In the lower part there is all the control electronics and in the upper part is placed the PC complete with all the accessories (monitor, keyboard, mouse and printer) to draw up the final test certificates.

GMM 40 - Small Size

IT MEASURES GEARS WITH OUTER DIAMETER UP TO 400 mm

It is a machine with high-level dynamic features thanks to the use of linear motors with pneumostatic supported tracks, which allow movement without any friction.

The structure includes three linear axes (X, Y, Z), a rotary axis (W) and a tailstock column, everything based on high-accuracy granite tracks. This permits a better long-term stability and a low thermodynamic response, even in case of temperature variation

Technical features

Movement	
CNC on the four interpolated axes - joystick for manual movement	
Measuring effective strokes	
X axis	350 mm
Y axis	240 mm
Z axis	390 mm
Diabase levelling table	
Thickness	130 mm
Width	1160 mm
Length	1070 mm
Total size and weight	
Length *	2800 mm (*desk included)
Width	1350 mm
Height	2000 mm
Weight	2600 kg
Resolution	
Linear axes	0.0001 mm
Rotary axis	0.0001 °
Electricity supply and consumption	
Electric energy	Three-phase + Neutral AC 380 V ± 10% 50 Hz 2 KVA
Energy consumption	1.6 KWh
Compressed air	Working pressure: 0.6 Mpa ± 0.05 Mpa; Dried with impurity filtering of 0.01µ; Available flow rate: 120 Nl/min to 0.6 Mpa
Max measurable size and weight of spur gears	
Maximum diameter	425 mm
Maximum height	350 mm
Maximum height between tips	700 mm (on demand up to 1450 mm)
Maximum weight allowed	200 kg

GMM 70 - Medium Size

IT MEASURES GEARS WITH OUTER DIAMETER UP TO 700 mm

Even though GMM 70 maintained the same construction principles, compared to the Small Size model, it has been created to allow to measure heavier and bigger samples with very high accuracy.

The structure lies on the floor with pneumatic autolevelling supports. This ensures that the whole measuring system is isolated from external stresses and that the kinetic energy of moving masses is absorbed. The rotary table is built in order to sustain a load of about 1500 kg thanks to the pneumostatic support on granite track.

Technical features

Measuring effective strokes	
X axis	650 mm
Y axis	350 mm
Z axis	590 mm
Diabase levelling table	
Thickness	300 mm
Width	1395 mm
Length	1370 mm
Total size and weight	
Length *	3200 mm (*desk included)
Width	1700 mm
Height	2350 mm
Weight	3500 kg
Resolution	
Linear axes	0.0001 mm
Rotary axis	0.0001 °
Electricity supply and consumption	
Electric energy	Three-phase + Neutral AC 380 V ± 10% 50 Hz 2 KVA
Compressed air	Working pressure: 0.6 Mpa ± 0.05 Mpa; Dried with impurity filtering of 0.01µ; Available flow rate: 120 Nl/min to 0.6 Mpa
Max measurable size and weight of spur gears	
Maximum diameter	700 mm
Maximum height	550 mm
Maximum height between tips	1000 mm (on demand up to 2000 mm)
Maximum weight allowed	400 kg

GMM 110 - Big Size

IT MEASURES GEARS WITH OUTER DIAMETER UP TO 1100 mm

GMM 110 is the larger model of the series and it has been sized and designed in order to be able to measure very big and heavy gears and other parts with high accuracy.

The structure is totally made of granite without any welded part. The sturdy rotary table, with a considerable diameter, lies on pneumostatic support tracks, and it is moved by an electronic axis and a next-generation encoder.

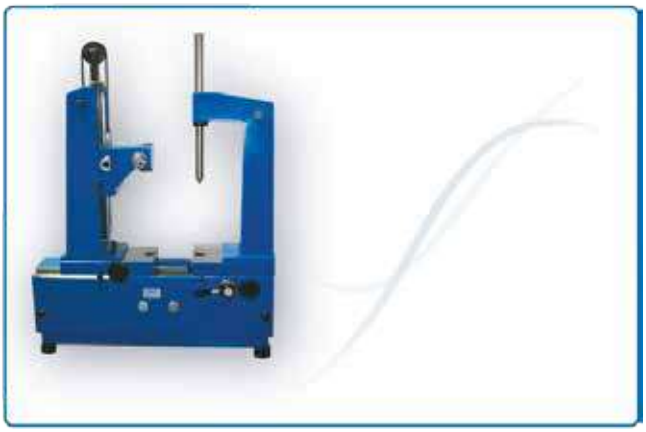
It can bear loads up to 2000 kg, maintaining a resolution of 0.36" of arc (3,600,000 counts per lap), thanks to a special torque motor with a big diameter and without using any type of mechanical reduction (electronic shaft).

Technical features

Movement	
CNC on the four interpolated axes - joystick for manual movement	
Measuring effective strokes	
X axis	900 mm
Y axis	600 mm
Z axis	600 mm
Diabase levelling table	
Thickness	450 mm
Width	1940 mm
Length	1570 mm
Total size and weight	
Length *	3350 mm (*desk included)
Larghezza	2115 mm
Height	2855 mm
Weight	5000 kg
Resolution	
Lineari axes	0.0001 mm
Rotary axis	0.0001 °
Electricity supply and consumption	
Electric energy	Three-phase + Neutral AC 380 V ± 10% 50 Hz 2 KVA
Compressed air	Working pressure: 0.6 Mpa ± 0.05 Mpa; Dried with impurity filtering of 0.01µ; Avilable flow rate: 120 Nl/min to 0.6 Mpa
Max measurable size and weight of spur gears	
Maximum diameter	1100 mm
Maximum height	550 mm
Maximum height between tips	1200 mm (on demand up to 2000 mm)
Maximum weight allowed	2000 kg

OTHER GEAR TESTING MACHINES

GEAR TESTING MACHINES



Gears engagement testing is a functional control; we can offer both single-flank and double-flank gear testing machines. The double-flank ones are recommended for the test of spur gears; the single-flank instruments, instead, are recommended for the control of spur gears, bevel gears and worm gears

The test is performed with either a measuring master or a torque gear.

The evaluation of results depends on the measuring system installed on the instrument.

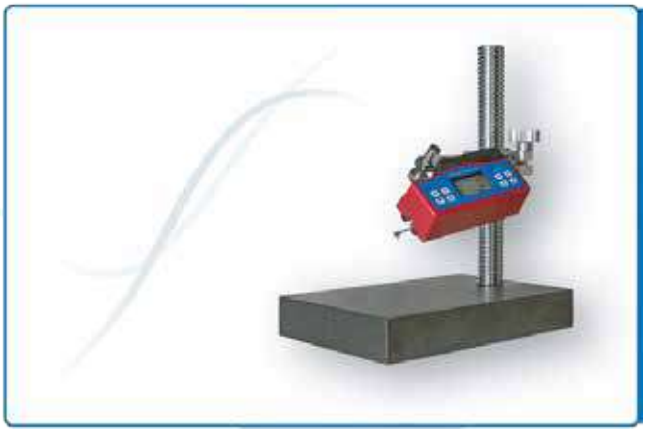
ROUGHNESS TESTERS

Roughness measurement can be very important on some parts; it can make piece's operating features change in a very significant way.

Using the roughness tester models SA6210, SA6230

and SA6260 can make easier to measure these parameters. These instruments are recognised to be effcient in hard-to-reach points' measurement.

They are specially recommended for roughness measurement on gear teeth, along both profile and helix's direction.



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