

Tool dynamometers

2 and 3 component tool dynamometers for measurement of cutting forces in drilling, turning and milling processes



Neu: Multimedia product presentation

<u>Tool dynamometer drilling</u> : "**BKM2000**" <u>Tool dynamometer turning</u> : "**DKM2000**" <u>Tool dynamometer milling</u> : "**FKM2000**" <u>Temperature measurement on tool tip</u> : "**TAD**" <u>Designs for tool dynamometer turning</u> <u>Details for tool dynamometer</u> <u>Software for tool dynamometers</u> <u>Start online inquiry</u>



Tool dynamometer turning



New: <u>Multimedia product presentation</u>

Three component dynamometer for cutting forces and tool tip temperature measurement of the turning process.

Introduction	This lightweight, easy to install three component dynamometer measures the cutting forces in any turning process. The body is based on a quick exchange toolholder available in <u>different</u> <u>designs</u> . The measured values can be read on the <u>internal display</u> or on a <u>large external display</u> using <u>auto-hold</u> . The PC-based data aquisition is performed over the built-in RS232 interface with our included <u>software for tool dynamometers</u> . Over the same interface the device parameter setup for <u>wear detection</u> will be executed. After the setup, the device is able to
	using <u>auto-hold</u> . The PC-based data aquisition is performed over the built-in RS232 interface with our included <u>software for tool dynamometers</u> . Over the same interface the device parameter setup for <u>wear detection</u> will be executed. After the setup, the device is able to
	measurement of the tool tip, which is fully integrated in the device. With this great properties the device suits multiple educational and industrial applications.

Measuring
systemsCutting Force Fc, Feed Force Ff, Passive Force Fp: Measuring range depends on design
Serial data rate: 9600bps; 10 /s

Experiments The following experiments are possible: Examination of the influence of the cutting geometry, material and lubricant coolant Investigation of the optimum parameters for a turning process

Keywords Tool dynamometer, cutting thrust meter, wear detection, break detection, tool monitoring, Turning, Borehole, Power, Force, Feed, Cut, Cutting, Burr, Temperature, Torque, Reduction of wear and tear, wear out



Tool dynamometer milling



New: Multimedia product presentation

Three component dynamometer for cutting force measurement of the milling process.

Introduction	This three component dynamometer measures the cutting forces in any milling process. It is a improved version based on a principle proved since 1982. The measured values can be read on a <u>large external display</u> using <u>auto-hold</u> . The PC-based data aquisition is performed over the built-in RS232 interface with our included <u>software for tool dynamometers</u> . With this great properties the device suits for multiple educational and industrial applications.
Measuring range	3-axes measurement: Fx, Fy, Fz = +/- 3000 N Serial data rate: 9600bps; 10 /s
Experiments	The milling processes' cutting thrust is measured on the workpiece. The workpiece is clamped to the dynamometer equivalent to a vice. The device itself is bolted onto the machine's table. The workpiece can be processed with all kinds of milling and grinding (!) tools. The device is protected against liquids. The following experiments are possible: Examination of the influence of the cutting geometry, material and lubricant cooling Investigation of the optimum parameters of a milling process
Dimensions	Size (w x d x h): 500mm x 160mm x 100mm (19.7" x 16.3" x 3.9") Weight: 18 kg (39.6 pounds)
Keywords	Tool Dynamometer, Cutting tool dynamometer, Cutting dynamometer, cutting thrust meter, wear detection, break detection, tool monitoring, Milling, Millerr, Power, Force, Feed, Cut, Cutting, Burr, Temperature, Torque, Reduction of wear and tear, wear out



Tool dynamometer drilling



New: <u>Multimedia product presentation</u> Two component dynamometer for measurement of cutting forces in drilling processes

- **Introduction** This lightweight, two component dynamometer measures the cutting forces in any drilling process. The measured values can be read on the <u>internal display</u> or on a <u>large external display</u> using <u>auto-hold</u>. The PC-based data aquisition is performed over the built-in RS232 interface with the included <u>software for tool dynamometers</u>. Over the same interface the device parameter setup for <u>wear detection</u> will be executed. After the setup, the device is able to supervise a drilling process without a connected PC. With this great properties the device suits multiple educational and industrial applications.
- Measuring
rangeAxial force Ff: compression & tensile +/- 5000 N
Axial torque M: right & left hand +/- 30 Nm
Serial data rate: 9600bps; 10/s
- Experiments The cutting forces of the drilling process is measured on the workpiece which is clamped to the head of the device. Usually, this is a bar with a 40x20 mm (1.63" x 0.82") cross-section. The device itself is bolted onto the machine's table. The measurement's range is suitable for drilling with drills up to 15mm (0.6") diameter and feeds up to appr. 0,3mm/rev. The device is protected against liquids. The following experiments are possible: Examination of the influence of cutting geometry, material and lubricant coolant Determination of the optimum parameters of a drilling process Investigation of any thread-cutting process (especially negative torque) Investigation of the pulling - effect occuring with some materials or drill geometries
- Dimensions Size (w x d x h): 170mm x 100mm x 100mm (6.94" x 3.94" x 3.94") Weight: 4,4 kg (9.7 pounds)
- **Keywords** Torque meter, Cutting Dynamometer, Tool Dynamometer, Cutting thrust meter, wear detection, break detection, Tool monitoring, Drilling, Drill, Borehole, Power, Force, Feed, Cut, Cutting, Burr, Temperature, Torque, Reduction of wear and tear, wear out



Temperature measurement on tool tip



New: <u>Multimedia product presentation</u>

Introduction	With this device it is possible to measure any lathe tool's temperature touch-free and with very fast reaction. It is based on an InGaAs-radiation sensor capable of measuring temperatures of any metal.
Technical data	Distance to tool tip: 100mm (4"); exact adjusting achieved by pilot lamp Measuring range: 300-800°C (570 °F - 1472 °F) Reaction time: negligible
Designs	 Single device with tool holder, box, display and serial data output Add-on device with fully mechanical and datatechnical integration in the tooldynamometer turning by a plug terminal
Keywords	Temperature, Temperature on tool tip, Tool tip temperature, Temerature measurement, Turning, Component Dynamometer, Tool Dynamometer, cutting thrust meter, wear detection

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Tool dynamometer details

Wear detection

Our tool dynamometers for drilling and turning implements a function for supervising and documentation of wear progress in any cutting process. This is achieved by comparing the Fc/Fp relation. Using our comprised cutting software, the maximum value is teached in by PC. When exceeding the maximum value, an alarm occurs. The current distance to the maximum will be shown on the internal display in 10%-steps. After teaching in the wear detection, the tool dynamometer is able to work independently of a pc.

Internal display



The illuminated, built-in internal display resists burrs and lubricant coolant. It shows the cutting forces, the tool tip temperature and the current wear progress on a 2x16 character dotmatrix display.

External large display



The large illuminated external display is connected to the serial data interface of the tool dynamometer and shows the same values as the internal display on a 2x20 character dotmatrix display with the dimensions 50mm x 180mm. The external display recognizes the connected tool dynamometer automatically and displays the affiliated quantities.

Auto-hold

This function provides fast manual data aquisition by reading data from the internal or external display. It implements an automatic detection of the stagnation of a cutting process, determines the average value and gives the operator a signal to collect a measuring data record. The operator stops the process. Now the value can be comfortably read on the display. Disturbance created by a scraping chisel is automatically filtered.



Tool dynamometer designs

The following matrix shows the different fixture types available on stock covering a variety of standard applications. Custom designs are available at request.

Design	Conventional small	Conventional medium	
Picture	New:	-	
Measuring range / max. load [N]	1200/1500	2000/2500	
Resolution [N]	1	1	
Immunity against overload	5 times	2 times	
Display	Yes	Yes	
Wear output	No	No	
Miscellaneous	Your prefered toolholder		

Design	CNC A	CNC B	CNC E
Picture			
Measuring range / max. load [N]	1200/1500	2000/2500	10000/12000
Resolution [N]	1	1	1
Immunity against overload	5 times	2 times	2 times
Display	No	No	No
Wear output	Yes	Yes	Yes
Miscellaneous	Cooling liquid is guided through the body. Available for left and right hand spindle rotation. Adaptor for square tools 25x25mm. DIN ISO 69880 or VDI 3425 turret holder.		

[Home] [Up] [Tool dynamometer drilling] [Tool dynamometer turning] [Tool dynamometer milling] [Temperature measurement on tool tip] [Tool dynamometer details] [Tool dynamometer designs] [Software for tool dynamometers] [Inquiry]



Software for tool dynamometers

- This software is made for the data acquisition with TeLC cutting tool dynamometers with serial data output
- m The HTML-instruction manual is readable with the Internet Explorer
- me The simulation mode allows training on the program without connected dynamometers
- The software contains a variety of features, such as data acquisition, calculation of derivated data and edit fields for technological data input
- me The quantities can be displayed with bars, tables and plotter with automatic scaling
- Different preconfigured evaluation templates
- Powerfull data editing functions for post editing



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