Most application requires measuring one or more forces in perpendicular/angular directions. IEICOS electronic dynamometer is designed to measure these forces. A number of design factors have been considered in manufacturing these dynamometers, such as; the exact location of force, stiffness required and the minimization of cross effects of force in one direction from the other. Ability to withstand extraneous force is the main feature of the dynamometer; generally the dynamometer is a structure capable of the measuring the desired forces while supporting extraneous force simultaneously present. IEICOS’ exclusive structure design employs latest art of technology in force measurement using highly stable strain gauge technique. The strain gauges are employed in such a way that the independent bridge senses the mutually perpendicular/angular force.

1(a) IEICOS DRILL TOOL DYNAMOMETER MODEL 600 Series

Drill tool dynamometer for measurement of both the thrust force of the control and the torque produced on the work piece. Used to establish drilling force, study tool configuration and lubricant characteristics. This can be bolted directly, as slots are provided to attach vise or fixture on both top and bottom flanges. The instrument is complete in sealed construction.

**Specifications:**

- **Force**: Torque and Thrust.
- **Range of force**:
  - For smaller drilling machines with ½ inch bolt mounting slot
    - Model 600A - 100kg. Thrust 10 kgm. Torque
    - Model 600B - 200kg. Thrust 10 kgm. Torque.
    - Model 600C - 500kg. Thrust 20 kgm. Torque.
  - For larger drilling machines with ½ inch bolt mounting slot
    - Model 601A - 100kg. Thrust 10 kgm. Torque
    - Model 601B - 200kg. Thrust 10 kgm. Torque.
    - Model 601C - 500kg. Thrust 20 kgm. Torque.
- **Sensor**: 4 arm bonded strain gauge component bridge for each force.
- **Bridge resistance**: 350 ohms typical.
- **Bridge Voltage**: 12 Volts Max.
- **Linearity**: ± 1% of full scale.
- **Accuracy**: ± 1% of full scale
- **Additional Facility**: Self centering vise 3” size to hold the Specimen

1(b) IEICOS DIGITAL MULTICOMPONENT FORCE INDICATOR (TWO CHANNEL)

MODEL 651

Instrument comprises of two independent digital display units calibrated to display force directly using two-component drill tool dynamometer.

This instrument comprises of independent DC excitation supply for feeding strain gauge bridges, signal processing system to process and compute respective force value for direct independent display in kgf units. Instrument operates on 230v, 50 c/s AC mains.

Size – 150×350×270 mm nominal.
2(a) IEICOS LATHE TOOL DYNAMOMETER MODEL 620 Series

The Lathe Tool Dynamometer has been designed so that it can be directly fixed on to the tool post using the hole provided on the dynamometer. The dynamometer can measure 3 forces in mutually perpendicular directions, i.e. horizontal, vertical and thrust, and is provided with 3 connector sockets.

Specification:

- **Force**: XYZ direction.
- **Range of force**:
  - For 12.5mm tool bits
    - Model 620A - 100kg. force in XYZ direction
    - Model 620B - 200kg. force in XYZ direction
    - Model 620C - 500kg. force in XYZ direction
  - For 25mm tool bits
    - Model 621A - 100kg. force in XYZ direction
    - Model 621B - 200kg. force in XYZ direction
    - Model 621C - 500kg. force in XYZ direction

- **Sensor**: 4 arm bounded strain gauge component bridge for each force.
- **Bridge resistance**: 350 Ohms typical
- **Bridge voltage**: 12 volts Maximum.
- **Linearity**: ±1% of full scale
- **Accuracy**: ±1% of full scale
- **Tool post dia**: 20mm (any other size required to be indicated)
- **Center height**: To be indicated.

2(b) IEICOS DIGITAL MULTICOMPONENT FORCE INDICATOR (THREE CHANNEL) MODEL 652

Instrument comprises of three independent digital display calibrated to display force directly using three component tool dynamometer.

This instrument comprises independent DC excitation supply for feeding strain gauge bridges, signal processing system to process and compute respective force value for direct independent display in kgf units. Instrument operates on 230v, 50 c/s AC mains.

Size – 150×475×270 mm nominal.

2(c) IEICOS DIGITAL TOOL TIP TEMPERATURE INDICATOR MODEL 671

Instrument is provided with a miniature thermocouple sensor Model TTS with a 3mm diameter stainless steel sheathing probe to place it in the drilled hole near the tool tip. The digital display calibrated to read tool tip temperature with the sensor.

Range: 1000 °C
Resolution: 1°C
Accuracy: +/- 1% of full scale
2(d) IEICOS INFRARED THERMOMETER FOR TOOL TIP TEMPERATURE MEASUREMENT

Non Contact measurement of tool tip temperature using infrared thermometer. Temperature Ranges upto max of 2200 deg C, User selectable deg C or F. Laser Sighting for accurate pointing for measurement.

3(a) IEICOS MILLING TOOL DYNAMOMETER
MODEL 630 Series

The milling tool dynamometer can be mounted on the table of the milling machine and any component to be milled can be fixed over the dynamometer. Slots are provided to mount the dynamometer to the milling machine. Holes have been provided on the milling dynamometer to enable any type of component to be fixed on it. The output terminals are provided for the force in XYZ direction acting on the working piece.

**Specification:**

<table>
<thead>
<tr>
<th>Force</th>
<th>X Y Z direction.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range of force:</td>
<td></td>
</tr>
<tr>
<td>Model 630A</td>
<td>100kg in XYZ direction</td>
</tr>
<tr>
<td>Model 630B</td>
<td>200kg in XYZ direction</td>
</tr>
<tr>
<td>Model 630C</td>
<td>500kg in XYZ direction</td>
</tr>
<tr>
<td>Model 630D</td>
<td>200 Kg. Force (X) &amp; Thrust (Y); 20 Kg. Torque for Vertical Milling.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sensor</th>
<th>4 arm bounded strain gauge component bridge for each force.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridge resistance</td>
<td>350 Ohms typical.</td>
</tr>
<tr>
<td>Bridge voltage</td>
<td>12 volts Maximum.</td>
</tr>
<tr>
<td>Linearity</td>
<td>±1% of full scale.</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±1% of full scale</td>
</tr>
<tr>
<td>Mounting</td>
<td>using slots provided</td>
</tr>
<tr>
<td>Additional Facility</td>
<td>Self centering vice 3” size to hold the specimen.</td>
</tr>
</tbody>
</table>

3(b) IEICOS DIGITAL MULTICOMPONENT FORCE INDICATOR (THREE CHANNEL)
MODEL 652

(Same as above in page no. 2 – 2(b))

IEICOS, Industrial Engineering Instruments, #203, 12th Main, 3rd Phase, Peenya Indl. Area, Bangalore – 560058
Ph: 91-80-28934520/28371386 Fax: 91-80-28371386 Email: marketing@ieicos.com
The grinding tool dynamometer can be mounted on a table of the grinding machine and any component being ground can be fixed over the dynamometer. Slots are provided to fix the dynamometer to the grinding machine. Holes have been provided on the grinding dynamometer to enable any type of component be fixed on it. Output terminals are provided for the force in X Y Z direction acting on the work piece.

**Specification:**

<table>
<thead>
<tr>
<th><strong>Force</strong></th>
<th>X Y Z direction.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Range of force</strong></td>
<td></td>
</tr>
<tr>
<td>Model 610A</td>
<td>100kg force in XYZ direction.</td>
</tr>
<tr>
<td>Model 610B</td>
<td>200kg force in XYZ direction.</td>
</tr>
<tr>
<td>Model 610C</td>
<td>500kg force in XYZ direction.</td>
</tr>
</tbody>
</table>

**Sensor:** 4 arm bounded strain gauge component bridge for each force.

**Bridge resistance:** 350 Ohms typical.

**Bridge voltage:** 12 volts Max.

**Linearity:** ±1% of full scale.

**Accuracy:** ±1% of full scale.

**Mounting:** using slots provided

**Additional Facility:** Self centering vice 3” size to hold the specimen.

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**4(b) IEICOS DIGITAL MULTICOMPONENT FORCE INDICATOR (THREE CHANNEL) MODEL 652**

(Same as above in page no. 2 – 2(b))

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**5) COMPUTER INTERFACE SOFTWARE IMDFIS AND HARDWARE DEVICE FOR COLLECTING DATA FROM IEICOS MULTI COMPONENT DIGITAL FORCE INDICATOR MODELS 651 / 652**
5) IEICOS ONLINE REAL-TIME TOOL WEAR MONITORING SYSTEM Model OTWMS

With real time video imaging system which is provided with a support to mount on the lathe and to point the camera to the tool, high end graphical software analysis tool for identification of initial datum line and to record flank wear progress. The software consists of display of real time video showing progressive wear against an overlaid datum line. The software includes date logging, archival, retrieval and plotting facility to graph of wear v/s time. Provided with a computer with installed software and all necessary tools, this system is a complete system ready to be used without any additional components. All you need is a lathe, a tool and a specimen.

5) IEICOS PRODUCTION ENGINEERING RESEARCH EXPERTISE

We have necessary expertise and facility to undertake any high end research work in the field of production engineering instrumentation and measurement as required by you or by your organization. If you or your staff are working towards research as part of their interest or towards their post graduate/Ph.D degree, we can provide necessary instrumentation, consultancy, guidance in development of equipment etc.

Please feel free to contact us with your requirements.

Mechanical Dimensions, location of Components, Controls and Panel Meters may be changed without notice to incorporate latest state of the Art of Technology.

INDUSTRIAL ENGINEERING INSTRUMENTS

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