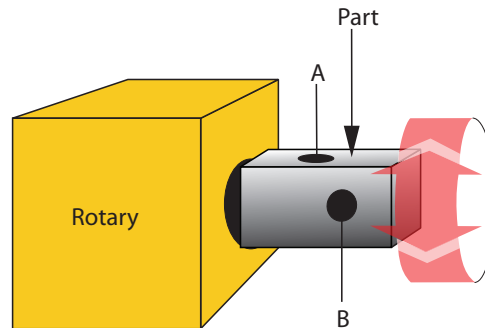


# Rotary Indexers

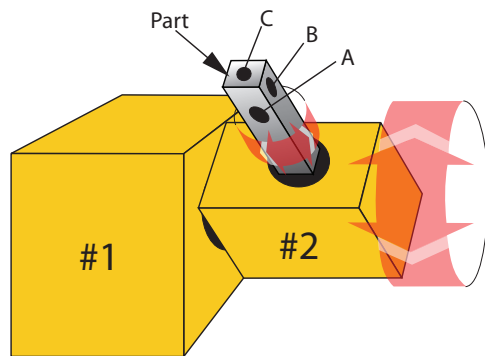
**Rotary Indexers** allow automatic part rotation to present features to available sensors at set angles for subsequent measurement.

- ZONE3® metrology software provides complete control of single and dual-axis rotary indexers, and on select models can rotate the part coordinate reference system in 3D space as the part is indexed for 4th and 5th axis measurements.
- Measure-X® and VMS™ metrology software support single-axis rotaries for 3-axis indexing of parts.
- Moment load capacity up to 30 kg-cm.
- A variety of standard chucks and collets are available, as well as compensation kits for 4th and 5th axis applications.
- A wide range of rotary indexer configurations to fit a variety of applications, from simple turned parts to complex-shaped parts such as turbine blades and vanes.

## Single and Dual-Axis Rotary Indexers

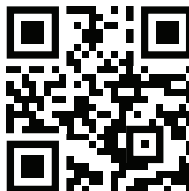


**Single Rotary** – Measure holes A and B with optical-axis sensors by rotating the part 90°



**Dual Rotaries** – Part with holes A, B, C on separate surfaces

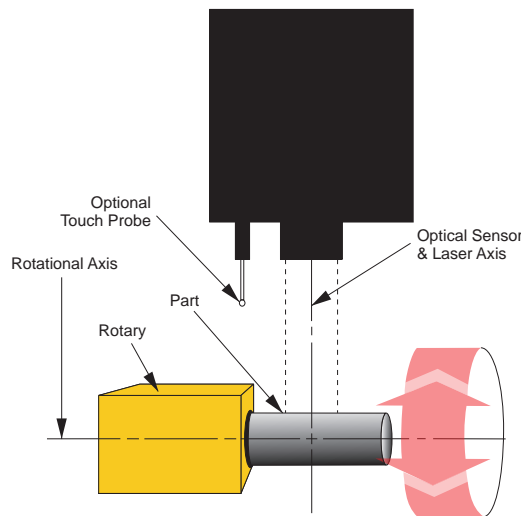
- Rotate rotary #1 until the part is horizontal
- Rotate #2 to measure A
- Rotate #2 90° to measure B
- Rotate rotary #1 until the part is horizontal



# Single-Axis Rotaries

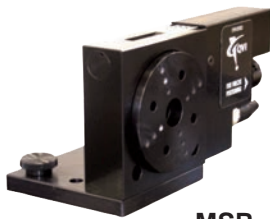
Single-axis rotary indexers are programmable angular positioning devices that allow automatic indexing of parts. A range of models are available, offering a variety of moment load capacities and levels of rotational resolution.

ZONE3 metrology software provides the ability to maintain the part coordinate system during rotation on MTR™, HDR, and HPR™ models for true 4th axis measurements.



## Single-Axis Rotary

Typical mounting configuration of a single rotary with its rotational axis perpendicular to the measurement system's optical axis, and parallel to the X- or Y-axis.



MSR

### Miniature Servo Rotary (MSR™)

The Miniature Servo Rotary is a compact, light duty indexer ideal for measuring parts in multiple views under automatic program control.

The MSR uses a worm-gear drive that relies on the accuracy of the gearing system to achieve rotary positioning. With a rotational resolution of 16 seconds of arc, the MSR is ideal for measuring screw machine parts, precision hydraulics and other turned or cylindrical parts. It is also ideal for measuring multiple views of prismatic parts in a single setup.



MTR

### MicroTheta™ Rotary (MTR)

The MicroTheta Rotary is a high-accuracy rotary indexer with twin reader heads for ultimate positional resolution with double the load capacity of the MSR.

The MTR produces 720,000 counts per revolution of the spindle per reading head, for angular position resolution greater than 2 seconds of arc.

With its closed loop feedback system, the MTR makes angular measurements to within  $\pm 5$  arc seconds. The MTR's resolution and feedback allow for relational measurements between rotations for 4th axis measurements.



HDR

### Heavy Duty Rotary (HDR)

The Heavy Duty Rotary is designed for holding heavy parts on floor model OGP measurement systems.

With a resolution of 3.6 seconds of arc and an accuracy rating of  $\pm 5$  arc seconds, the HDR is an excellent choice for larger parts or to support a dual rotary combination, allowing a fifth measurement axis. It can carry loads up to 30 kg-cm.

The HDR combines high load capacity with high precision angular positioning in a rotary indexing system designed for demanding industrial applications.



HPR

### High Precision Rotary (HPR)

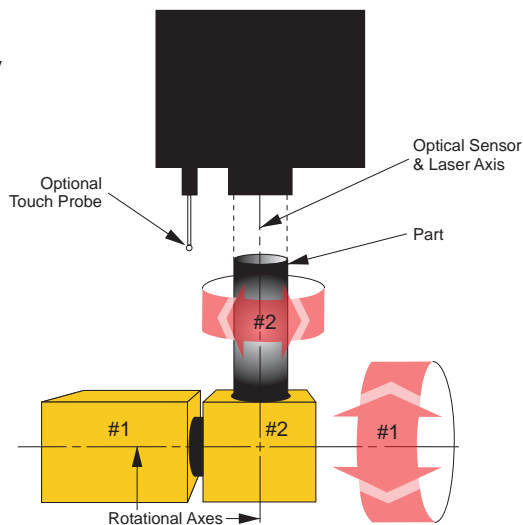
The High Precision Rotary provides high accuracy air-bearing fourth axis measuring. Its air bearing spindle, DC servo motor, and precision-ruled rotary encoder provide the accuracy required to measure angular displacement between features.

Its high speed and rigid body behavior allow 360 degrees of rotation in less than 8 seconds. It is ideal for the most demanding measurements that require the highest precision with an accuracy of  $\pm 1$  arc second.

# Dual-Axis Rotaries

## Dual Rotary

Rotary #1 rotates Rotary #2, which holds the part under test. Adjusting the positions of both #1 and #2 allows the surfaces of complex parts like turbine blades to be presented perpendicular to the optical axis along their entire path. Note: The size of the part limits the usable range of Rotary #1 during a measurement.



Mount two rotary indexers together with their axes perpendicular to one another to add two axes of part positioning. The part under inspection is attached to the secondary rotary, which is mounted to the primary rotary. The part can be rotated in two different axes to bring features with compound angles into the line of sight of the optical sensor axis and within reach of measuring laser sensors or touch probes.

ZONE3 metrology software fully supports the simultaneous rotation of two rotaries for 5th axis measurements with HDR/MTR and HDR/HDR combinations.

## MicroTheta Rotary/Miniature Servo Rotary (MTR/MSR)

Combine MicroTheta Rotary and Miniature Servo Rotary indexers on a benchtop measuring machine to provide rotary motions in two perpendicular axes.

The MTR is used as the primary rotary in this configuration, making this setup ideal for positioning complex, lightweight parts into separate views.



MTR/MSR

## Heavy Duty Rotary/MicroTheta Rotary (HDR/MTR)

Using Heavy Duty Rotary and MicroTheta Rotary indexers during a measurement routine allows for the rotation of parts into view with higher accuracy.

The HDR is used as the primary rotary in a configuration that allows for complex measurements on small parts. This popular combination offers rotational positioning accuracy to  $\pm 5$  arc seconds for part loading of up to 8 kg-cm.

Use the combination of Heavy Duty Rotary and MicroTheta Rotary for more challenging, high precision measurement requirements that require a 3D datum structure and relationships between rotations to achieve 5th axis measurements.



HDR/MTR

## Heavy Duty Rotary/Heavy Duty Rotary (HDR/HDR)

The dual Heavy Duty Rotary configuration has a 30 kg-cm load capacity, allowing for rotation of larger parts.

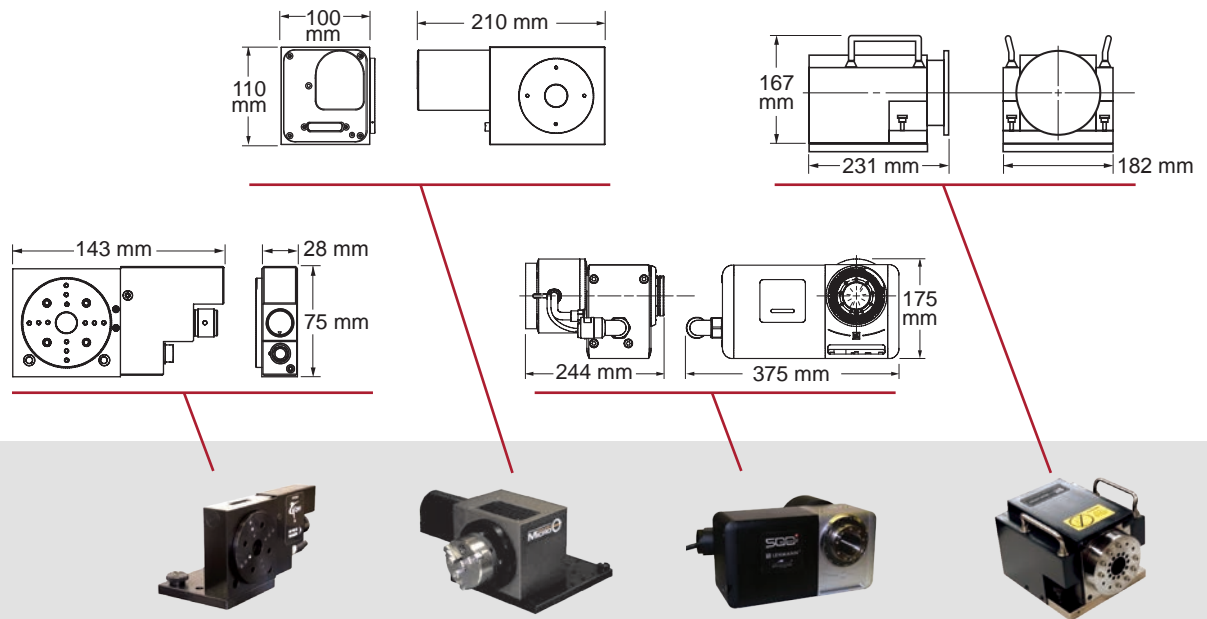
With a high rotational positioning accuracy of  $\pm 5$  arc seconds, dual HDRs can rotate heavy parts while maintaining optimum positional accuracy.

The dual HDR is a premium dual rotary, ready to handle the most challenging industrial applications.



HDR/HDR

# Rotary Indexers



## Technical Specifications

	Miniature Servo Rotary (MSR™)	MicroTheta Rotary (MTR™)	Heavy Duty Rotary (HDR)	High Precision Rotary (HPR™) <sup>1</sup>
<b>Dimensions<sup>2</sup></b>	143 x 28 x 75 mm	210 x 100 x 110 mm	375 x 244 x 175 mm	231 x 182 x 167 mm
<b>Spindle Centerline to Worktable<sup>3</sup></b>	46 mm	66 mm	110 mm	95 mm
<b>Faceplate Diameter</b>	61 mm	85 mm	70 mm	106 mm
<b>Resolution<sup>4</sup></b>	16 seconds of arc	2 seconds of arc	3.6 seconds of arc	0.9 seconds of arc
<b>Accuracy<sup>4</sup></b>	± 2 arc min	± 5 arc sec	± 5 arc sec	± 1 arc sec
<b>On-axis Max Load Capacity<sup>5</sup></b>	4.0 kg-cm	8.0 kg-cm	30 kg-cm	12.0 kg-cm
<b>Off-axis Max Load Capacity</b>	2.0 kg-cm	4.0 kg-cm	15 kg-cm	5.0 kg-cm

<sup>1</sup>Requires compressed air. Air supply pressure: 0.62 MPa; Minimum flow capacity: 28 l/min; Air quality ISO 8573-1:2010 Class 4.3.4 or better.

<sup>2</sup>Dimensions do not include rotary base plate.

<sup>3</sup>When axis is in XY plane.

<sup>4</sup>Resolution and accuracy specifications with off-axis faceplate loading may be greater than standard specifications.

<sup>5</sup>With symmetrically distributed load.

See machine datasheets for which rotaries are supported on each measurement system.



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