PART POSITIONING SOLUTIONS
Motoman offers the widest selection of positioners, designed to meet a broad range of industrial positioning needs. Determining which positioner is best for a particular application requires more than just sizing a motor to a gearbox. Other factors include:

- Ensuring that inertia characteristics match between the motor, input drive and output drive
- Motor torque curve and acceleration/deceleration rates
- Reducer backlash
- Bearing loading

Motoman has developed MotoSize software that factors in more than 30 variables relating to performance requirements. MotoSize is used to determine the best positioner for a specific application.

Approach

Engineering started by creating modules for Motoman Headstock (MH) drives. These compact housings have multiple mounting points so they can be used as headstocks, tables or at angles in between. Features like weld grounds and safety-rated position switches are integrated into the housings.

Motoman has extended this product line every year with new drive modules and positioner configurations that use these modules.

Result

Motoman has the most extensive line of positioner products of any robotics company, with positioners for a wide range of markets, including:

- Automotive – high-speed positioners that index medium payloads in 2-3 seconds
- Construction machinery – heavy-duty positioners that handle heavy parts or require the robot to be positioned
- Job shops – economical positioner solutions that index in 4-6 seconds

Motoman easily adapts to unique requirements by combining modules into custom-tailored solutions or using standard products from our parent company, Yaskawa Electric Corporation, and our European partners.
ROBUST, FIELD-PROVEN, LIFE TESTED

Every Motoman positioner product is developed following ISO 9001 procedures, so products adhere to a strict international standard of quality. Released products are dedicated to a unique Life Test area, where continuous life cycle testing of half a million dollars worth of equipment is performed 24/7/365. This ongoing effort represents more than 80 years of testing time, and is designed to identify potential problems before they occur in the field. Even details like weld grounds were engineered and life-tested for reliability, especially for the demands of multiple robots. Many Motoman positioners sold more than 20 years ago are still in production and some have even been redeployed with new robots.

SPIN-OFF TECHNOLOGY

As a spin-off to our positioner technology, Motoman developed MotoMount™ – a patent-pending system used to mount fixturing between headstocks and tailstocks. This innovative design reduces the stresses in the bearings from moment loading; reduces cost by eliminating the need for machined bases, spanners and precision tailstocks; improves tooling repeatability; and facilitates easy and quick fixture changeover.

Motoman also has patents pending on unique light-tight enclosures for laser processing.

CUSTOMER SUPPORT

Competitors often reference only a payload capacity for their positioners. Motoman’s experience has proven that other considerations are also critical; therefore, all Motoman positioners have published specifications for payload, turning torque and repeatability. Motoman offers free MotoSize software to help integrators or end-users select a positioner by entering specific application requirements. The software outputs a graphical report that indicates exactly where the application falls in the performance range.

Motoman recognizes that system uptime is dependent upon the positioner as well as the robot. Motoman uses the same motors to drive the robots and positioners, so spares are always available. Additionally, Motoman tries to use reducers common to the robots; otherwise, long lead-time items are kept in stock.

NOT SURE WHICH POSITIONER IS RIGHT FOR YOUR PROJECT?

Motosize™

While many companies only provide payload information about their positioners, Motoman provides additional critical parameters, including cycle dwell time, load inertia, load CG overhang, torque, acceleration and moment.

Motoman’s published payload ratings are conservative and it is often possible to exceed these ratings. Depending on the application, either the bearings, gear reducer or motor might be limiting factors. More than 30 variables are factored in when calculating whether a particular positioner is appropriate for a specific application.

MotoSize software allows users to enter their unique application and tooling parameters and then automatically generates a report that graphically displays a list of available Motoman positioners that conform to all application criteria. Application data can be graphed by holding torque (load CG off-center), by rated bearing moment (load CG overhang) and by allowable load inertia.
## TURNTABLES

- For small- to medium-size parts
- Operator safely loads/unloads part(s) on one side of the positioner (outside the robot’s work envelope), while the robot welds part(s) on the other side
- Metal arc screen divider creates barrier; safeguards operator from arc flash
- Run same part(s) on both sides of positioner or run one part on Side A and different part on Side B
- H-frame table top, low-inertia and quick-change tooling
- Options: tooling plates, 72" table top and slip rings for utilities

### Payload capacity (per side)

<table>
<thead>
<tr>
<th>Type</th>
<th>MR-300</th>
<th>MSR-200</th>
<th>MSR-500</th>
<th>MSR-1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design</td>
<td>2-position</td>
<td>2-position servo-driven</td>
<td>2-position servo-driven</td>
<td>2-position servo-driven</td>
</tr>
<tr>
<td>Thru-hole</td>
<td>120 mm</td>
<td>none</td>
<td>100 mm</td>
<td>100 mm</td>
</tr>
<tr>
<td>Drive</td>
<td>AC motor driven</td>
<td>indexing motor control</td>
<td>indexing motor control</td>
<td>indexing motor control</td>
</tr>
<tr>
<td>Index</td>
<td>4-sec</td>
<td>4-sec</td>
<td>2-sec</td>
<td>5-sec</td>
</tr>
<tr>
<td>Table Diameter</td>
<td>1,524 mm</td>
<td>1,524 mm</td>
<td>1,524 mm</td>
<td>1,524 mm</td>
</tr>
<tr>
<td>ArcWorld Use</td>
<td>AWI-1000</td>
<td>AWI-1000</td>
<td>AWI-1000</td>
<td>AWI-1000</td>
</tr>
</tbody>
</table>

* Servo-driven models have option of multiple index positions or continuous rotation

## ROTATING TURNTABLES

- Medium- to high-volume production
- Provides large turning diameter for shorter parts
- Three servo-motor control
  - All axes can turn simultaneously while indexing
  - Operator can jog station axis while robot welds
- Rotary axis motion can be coordinated with one or two robots
- Load position can be programmed in 30-degree increments
- Ergonomic loading and programming heights
- MotoMount fixture mounting system

### Payload

<table>
<thead>
<tr>
<th>Type</th>
<th>MSR2S-500</th>
<th>MSR2S-750</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payload</td>
<td>500 kg per side</td>
<td>750 kg per side</td>
</tr>
<tr>
<td>180° Sweep Time</td>
<td>3.7 sec.</td>
<td>5 sec.</td>
</tr>
<tr>
<td>Turn Speed</td>
<td>0-19.6 rpm</td>
<td>0-20.7 rpm</td>
</tr>
<tr>
<td>Max Part Size</td>
<td>2,000 mm L x 1,300 mm dia</td>
<td>3,000 mm L x 1,300 mm dia</td>
</tr>
<tr>
<td>Sweep Dia.</td>
<td>3.711 mm</td>
<td>4.711 mm</td>
</tr>
<tr>
<td>Repeatability</td>
<td>±0.1 mm</td>
<td>±0.1 mm</td>
</tr>
<tr>
<td>Welding Ground</td>
<td>800 Amps</td>
<td>800 Amps</td>
</tr>
<tr>
<td>Tailstock Thru-hole</td>
<td>41 mm</td>
<td>41 mm</td>
</tr>
<tr>
<td>ArcWorld Use</td>
<td>AWI-1000</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>MSR2S-750</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweep Dia.</td>
<td>Ø 3711 Sweep Dia</td>
</tr>
<tr>
<td>Tailstock Thru-hole</td>
<td>41 mm</td>
</tr>
<tr>
<td>ArcWorld Use</td>
<td>AWI-1000</td>
</tr>
</tbody>
</table>
Dual Headstock/Tailstock Trunnion Positioners

- Medium- to high-volume, medium- to high-product mix production
- Operator safely loads/unloads parts from outside robot's work envelope
- Space-saving design for parts three meters or longer (five-meter spans on most models)
- Servo control with absolute encoder feedback provides infinite part positioning location and coordinated motion during welding; part joints are kept in gravity-neutral welding plane
- Coordinated motion software is standard with positioner
- Metal arc screen divider creates barrier; safeguards operator from arc flash
- Two different design configurations:
  - Patented single-motor drive
    - Economical design requires fewer parts and uses single motor to operate all three axes; operator load station locks into position
  - Three-motor drive with patented "X-beam"
    - Each axis is driven independently; cycle time can be reduced by positioning part while sweeping; and operator station can be repositioned while robot is welding
- Tailstock options: slip rings for fixture signals and high-volume (3/4 in.) air lines

### Rated Payload (per side)

<table>
<thead>
<tr>
<th></th>
<th>MRM2-250M3X</th>
<th>MRM2-300/600/900M3X</th>
<th>MRM2-500STN</th>
<th>MRM2-600M3X</th>
</tr>
</thead>
<tbody>
<tr>
<td>250 kg</td>
<td>500 kg</td>
<td>600 kg</td>
<td>900 kg</td>
<td>250 kg</td>
</tr>
<tr>
<td>600 kg @ 232 mm</td>
<td>900 kg</td>
<td>300 mm</td>
<td>1,012 mm</td>
<td>900 mm</td>
</tr>
<tr>
<td>2,600 mm</td>
<td>3,000 mm</td>
<td>2,650 mm</td>
<td>5,400 mm</td>
<td>2,650 mm</td>
</tr>
<tr>
<td>975 mm</td>
<td>1,050 mm</td>
<td>900 mm</td>
<td>910 mm</td>
<td>910 mm</td>
</tr>
<tr>
<td>2,920 mm ±7.5 pin to pin</td>
<td>2,920 mm ±7.5 pin to pin</td>
<td>2,920 mm ±7.5 pin to pin</td>
<td>2,920 mm ±7.5 pin to pin</td>
<td>2,920 mm ±7.5 pin to pin</td>
</tr>
</tbody>
</table>

### Index Time**

<table>
<thead>
<tr>
<th></th>
<th>MRM2-250M3X</th>
<th>MRM2-300/600/900M3X</th>
<th>MRM2-500STN</th>
<th>MRM2-600M3X</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 sec</td>
<td>7 sec</td>
<td>6.7 sec</td>
<td>10.2 sec</td>
<td>1.5 sec</td>
</tr>
<tr>
<td>4.8 sec</td>
<td>6.7 sec</td>
<td>10.2 sec</td>
<td>1.5 sec</td>
<td>2.0 sec</td>
</tr>
<tr>
<td>4.2 sec</td>
<td>6.7 sec</td>
<td>10.2 sec</td>
<td>1.5 sec</td>
<td>2.6 sec</td>
</tr>
</tbody>
</table>

### Tooling Envelope

<table>
<thead>
<tr>
<th></th>
<th>MRM2-250/500STN</th>
<th>MRM2-300/600/900M3X</th>
<th>MRM2-500STN</th>
<th>MRM2-600M3X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 1,170 max.</td>
<td>1,350</td>
<td>1,300 max.</td>
<td>1,688</td>
<td>1,820</td>
</tr>
<tr>
<td>Ø 2,672 max.</td>
<td>3,000 mm</td>
<td>3,000 mm</td>
<td>4,745</td>
<td>4,630</td>
</tr>
</tbody>
</table>

### Tailstock Options

- Slip rings for fixture signals and high-volume (3/4 in.) air lines

### Design Configurations

- **Single-Motor Models**
  - Patented single-motor drive
  - Economical design requires fewer parts and uses single motor to operate all three axes; operator load station locks into position

- **Three-Motor Models**
  - Three-motor drive with patented "X-beam"
  - Each axis is driven independently; cycle time can be reduced by positioning part while sweeping; and operator station can be repositioned while robot is welding

### Software Features

- Coordinated motion software is standard with positioner

### Other Features

- Operator safely loads/unloads parts from outside robot's work envelope
- Space-saving design for parts three meters or longer (five-meter spans on most models)
- Servo control with absolute encoder feedback provides infinite part positioning location and coordinated motion during welding; part joints are kept in gravity-neutral welding plane
- Tailstock options: slip rings for fixture signals and high-volume (3/4 in.) air lines

---

* Index time for single-motor units includes 180° of tooling rotation
** Tooling envelope limited in depth during sweep motion
† Larger turning diameters available
HEADSTOCK/TAILSTOCK POSITIONERS

- Available as individual headstocks or combined with MotoMount
- Compact design allows MH units to be easily integrated into other machines or multi-axis positioners
- MH units can be mounted at an angle or as a rotary table
- Units have conservative torque rating and payload increases with tailstock (Contact Motoman for specification details)
- Multiple stations can be combined with a single robot controller or with a multiple robot controller
- Motion can be coordinated with the robot for welding contoured parts

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Load (kgf)</td>
<td>90</td>
<td>180</td>
<td>500</td>
<td>1,600</td>
<td>2,000</td>
<td>3,000</td>
<td>300</td>
<td>600</td>
<td>900</td>
<td></td>
</tr>
<tr>
<td>Rated MHT Load @ CG Off Center (kgf @ mm)</td>
<td>550 @ 30</td>
<td>550 @ 50</td>
<td>1,075 @ 80</td>
<td>3,000 @ 95</td>
<td>6,300 @ 30</td>
<td>6,300 @ 90</td>
<td>1,717 @ 50</td>
<td>2,601 @ 50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>180° Sweep Time (sec)</td>
<td>1.72</td>
<td>2.92</td>
<td>3.55</td>
<td>2.98</td>
<td>3.56</td>
<td>5.98</td>
<td>1.40</td>
<td>2.10</td>
<td>2.92</td>
<td></td>
</tr>
<tr>
<td>Rated CG Off Center (mm)</td>
<td>152</td>
<td>152</td>
<td>152</td>
<td>152</td>
<td>152</td>
<td>152</td>
<td>152</td>
<td>152</td>
<td>152</td>
<td></td>
</tr>
<tr>
<td>Rated CG Overhang (mm)</td>
<td>500</td>
<td>300</td>
<td>100</td>
<td>600</td>
<td>70</td>
<td>1,578</td>
<td>1,578</td>
<td>1,578</td>
<td>1,578</td>
<td></td>
</tr>
<tr>
<td>Load @ 99 mm CG Overhang (kgf)</td>
<td>75</td>
<td>75</td>
<td>175</td>
<td>500</td>
<td>1,400</td>
<td>1,400</td>
<td>1,400</td>
<td>1,400</td>
<td>1,400</td>
<td></td>
</tr>
<tr>
<td>Rated Inertia (kg*m²)</td>
<td>15</td>
<td>58</td>
<td>119</td>
<td>678</td>
<td>300</td>
<td>3,058</td>
<td>300</td>
<td>208</td>
<td>477</td>
<td></td>
</tr>
<tr>
<td>Rated Torque (Nm)</td>
<td>157</td>
<td>275</td>
<td>829</td>
<td>2,626</td>
<td>1,789</td>
<td>4,622</td>
<td>475</td>
<td>842</td>
<td>1,276</td>
<td></td>
</tr>
<tr>
<td>Rated Weld Current (std/opt)</td>
<td>400/800</td>
<td>400/800</td>
<td>800/1,200</td>
<td>800/1,600</td>
<td>1,200</td>
<td>1,200</td>
<td>1,200</td>
<td>1,200</td>
<td>1,200</td>
<td></td>
</tr>
<tr>
<td>Allowable Thrust (kgf)</td>
<td>400</td>
<td>400</td>
<td>800</td>
<td>2,000</td>
<td>3,000</td>
<td>3,000</td>
<td>300</td>
<td>800</td>
<td>800</td>
<td></td>
</tr>
<tr>
<td>Motor Power (kW)</td>
<td>0.6</td>
<td>0.6</td>
<td>1.3</td>
<td>3.7</td>
<td>4.4</td>
<td>4.4</td>
<td>1.3</td>
<td>1.3</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>Faceplate Thru-hole (mm)</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td></td>
</tr>
<tr>
<td>Tailstock Thru-hole (mm)</td>
<td>38</td>
<td>38</td>
<td>41</td>
<td>45</td>
<td>46</td>
<td>46</td>
<td>46</td>
<td>46</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>Drive Assembly Weight (kg/lbs)</td>
<td>54/118</td>
<td>54/118</td>
<td>100/220</td>
<td>390/860</td>
<td>918/2,022</td>
<td>918/2,022</td>
<td>293/645</td>
<td>293/645</td>
<td>293/645</td>
<td></td>
</tr>
</tbody>
</table>

MotoSize software provides detailed analyses
NEED TO INTEGRATE YOUR FIXTURE?

OPTIONS

External Axis Kits
- Three axes can be mounted in NX100 cabinet
- Side-mount cabinet can house up to five axes
  - 5-Amp unit can drive up to 3.4 kW
  - 25-Amp unit can drive up to 15.9 kW
- Kits are available with and without motors
- Motor sizes: 600 W, 1.3 kW, 3.0 kW, 3.7 kW, 4.4 kW and 5.5 kW
- External axis kits for Sigma II and Sigma III motors (90 volt vs. 24 volt brakes)

Slip Ring Kits
- Extends cable life
- Fixture wires routed through continuously rotating slip ring
  - 10 wire (4@6A, 6@2A)
  - 12 wire @10A + 10 mm air line
  - 3/4-in. high-volume air line
  - Hydraulic unions
- Kits for MRM2 and MHT positioners

Servo Disconnect
- Heavy-duty contactor is used to remove drive power from operator load stations, if required by risk assessment

Door-Guard Table
- Safeguarded loading station barrier door separates operator from robot envelope.
  - Light curtains can be located inside cell and interlocked with door to safeguard operator.
  - 1.2-m or 1.6-m width
  - Electric operation
  - 2-sec up/down 3x per minute
  - Welding or non-welding applications

MULTI-AXIS POSITIONERS

MDC – Drop-Center Positioner
- Suited to very heavy frame components
- Framework supports counterweights for parts with off-center CG
- Thru-hole in faceplate for utilities

MH1600-500 TR – Tilt-Rotate Positioner
- Suited to construction equipment subassemblies
- Offset design allows open access for part load/unload
- Standard MH modules can be reconfigured with different mounting structure

MotoPos – Tilt-Rotate Positioner
- Suited to automotive assemblies such as seats or manifolds
- Very low-profile design provides ergonomic load heights
- Optional slip rings to deliver fixture utilities through the faceplate

DROP-CENTER AND TILT-ROTATE POSITIONERS

Multi-axis positioners provide added application flexibility. Many provide two axes, allowing most welding to be done in the optimum position, thereby increasing travel speeds. Motoman software supports the coordination of both axes with robot motion.

NEED TO INTEGRATE YOUR FIXTURE?

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MOTOMOUNT™ – FIxt ure Mounting SyStem

- Reduces cost by eliminating machined bases, spanners and precision tailstocks (units bolt to framework or floor)
- Eliminates need for precision HS/TS alignment (allows up to two degrees of misalignment)
- Reduces tooling costs due to lower-precision mounting holes (can weld tailstock shaft to the fixture)
- Easy and quick fixture changeover
- Scalable to different sizes: 500 kg and 3,100 kg
- Improves tooling repeatability

Traditional Mounting System vs. MotoMount

Fixed mount increases stress on headstock/tailstock
- Alignment is critical with fixed mount
- Expensive machined base is necessary for HS/TS alignment

MotoMount Solution

- Reduces stress close to 7x or more as span goes beyond three meters
- Increase positioner life due to less stress and wear on bearings
- Improved repeatability; stress from restrained load does not cause warpage
- Pinned fixture blocks provide quick, repeatable changeover

Positioner Configurations
**TRANSPORTERS**

Moving the robot greatly increases the working range and application flexibility. Motoman provides rotary transporters for robots in overhead- or floor-mounted configurations (MotoSweep-O, -F). Linear transporters are also available (MotoRail) in wall- or floor-mounted configurations. Both are available in heavy-duty configurations for large-payload robots. Multi-axis gantries are also available.

**MotoRail**

- Suited for machine load/unload or welding applications
- Track motion is coordinated with robot
- 6-axis robot on rail provides additional range of motion and lower cycle time

---

**MotoSweep O and MotoSweep F**

- Suited for machine loading, press tending or arc welding
- Provides expanded working range for robot with minimal floorspace
- Full 360° working range
- Variety of payload capacities and boom lengths

---

**MOTOSWEEP O-20**

- Robot(s): HP20, HP20-6, EA12000NT
- Mount: Ceiling, Wall
- Height: 2,640 mm
- Boom L: 2,000 mm
- Offset: 1,026 mm

---

**MOTOSWEEP F**

- Robot(s): HP20, HP20-6, EA12000NT
- Mount: Ceiling, Wall
- Height: 2,640 mm
- Boom L: 2,000 mm

---

**MOTOSWEEP O-50**

- Robot(s): HP50, HP50-20
- Mount: Ceiling
- Height: 2,640 mm
- Boom L: 2,000 mm

---

**MOTOSWEEP O-50**

- Robot(s): HP50, HP50-20
- Mount: Ceiling
- Height: 2,640 mm
- Boom L: 2,000 mm

---

Options: hard stops, zone rings, and weld wire assist feeder

---

Options: limit switch kits and wire feeder assist kits
Gantry

- Expands range of robot
- Coordinated motion between all axes

Heavy-Duty Drive Module

- Heavy-duty turning unit can be integrated with heavy fixtures
- Low-profile design
- Turning unit is common with MotoSweep HD

Floor Tracks

- Wide variety of payload capacities and travel speeds available.
- Robot motion coordinated with linear travel and part positioners
- Options include multiple carriages on single track or larger carriages to carry robot controller or process equipment.

MotoSweep O HD

- Heavy capacity supports large-payload robots (HP200T)
- Provides extended support (2.5-m) for long-arm HP50-20

<table>
<thead>
<tr>
<th></th>
<th>HP200T</th>
<th>HP50</th>
<th>HP50-20</th>
<th>HP50-35</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweep Radius (A)</td>
<td>2,000</td>
<td>2,750/3,500</td>
<td>2,750/3,500</td>
<td>2,750/3,500</td>
</tr>
<tr>
<td>Working Range (X)</td>
<td>3,415</td>
<td>2,846</td>
<td>3,184</td>
<td>2,625</td>
</tr>
<tr>
<td>Boom Velocity</td>
<td>3.9 rpm</td>
<td>3.9 rpm</td>
<td>3.9 rpm</td>
<td>3.9 rpm</td>
</tr>
<tr>
<td>Boom Range</td>
<td>±180°</td>
<td>±180°</td>
<td>±180°</td>
<td>±180°</td>
</tr>
<tr>
<td>Repeatability</td>
<td>±0.15 mm</td>
<td>±0.15 mm</td>
<td>±0.15 mm</td>
<td>±0.15 mm</td>
</tr>
</tbody>
</table>

Leads the industry with multiple robot control

Jigless

- Combine robots of varying payloads and applications for flexibility
- Utilize part positioning robots for optimum process speeds and flexibility
- Robotic unload of bulky/heavy assemblies can reduce worker injuries and lower insurance rates
- Automatic part inspection can be incorporated into unload operation for separation of conforming and non-conforming parts

Robots provide six degrees of freedom with up to 600 kg payload capacity at an economical price. Multiple robots can be combined to lift heavier parts. Motoman’s industry-leading multiple robot control has been used to create unique solutions to incorporate handling robots for pre- or post-processing as well as “jigless” applications.
**EUROPEAN POSITIONERS**

**VMF – Five-Axis Indexing Tilt-Rotate Positioner**
- Suited to longer parts such as final exhaust assemblies
- Tilting axis allows complex geometries to be welded in 1F position
- Positioner base is angled to provide ergonomic load height

<table>
<thead>
<tr>
<th>VMF-500</th>
<th>VMF-750</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payload</td>
<td>500 kg per side at 173 mm offset</td>
</tr>
<tr>
<td>Sweep Time</td>
<td>6 sec</td>
</tr>
<tr>
<td>Turn Speed</td>
<td>0-5.2 rpm tilt, 0-16.8 rpm rotate</td>
</tr>
<tr>
<td>Max Part Size</td>
<td>3,200 mm L x 1,500 mm dia.</td>
</tr>
<tr>
<td>Torque (Static)</td>
<td>2,400 Nm, 848 Nm</td>
</tr>
</tbody>
</table>

**MDK – Heavy-Duty Tilt-Rotate Positioner**
- Ideal for contoured parts such as catalytic converters
- Stout design supports heavy fixtures with hydraulic clamping
- Optional slip rings for utilities through the center faceplate

<table>
<thead>
<tr>
<th>MDK-3000-4.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payload</td>
</tr>
<tr>
<td>Torque</td>
</tr>
<tr>
<td>180° Indexing Time</td>
</tr>
<tr>
<td>Distance to CL</td>
</tr>
</tbody>
</table>

**RWV4 – 4-Station Rotary Table**
- Suited to automotive exhaust or seating assemblies
- Multiple stations allow two process stations plus load/unload stations
- Large capacity slip ring allows continuous rotation

<table>
<thead>
<tr>
<th>RWV4-500</th>
<th>RWV4-1500</th>
<th>RWV4-2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payload per Station</td>
<td>500 kg</td>
<td>1,500 kg</td>
</tr>
<tr>
<td>Distance Between Fixture Plates (A)</td>
<td>1,200-2,000 mm</td>
<td>1,400-3,000 mm</td>
</tr>
<tr>
<td>Rated Offset, from Center of Gravity</td>
<td>188 mm</td>
<td>188 mm</td>
</tr>
<tr>
<td>Maximum Fixture Width, Dia. (D)</td>
<td>1,200, 1,600 mm</td>
<td>1,200, 1,600 mm</td>
</tr>
<tr>
<td>Maximum Speed (X-axis)</td>
<td>28.3 rpm</td>
<td>28.3 rpm</td>
</tr>
<tr>
<td>Maximum Speed (Y-axis)</td>
<td>1.5 sec</td>
<td>1.6 sec</td>
</tr>
<tr>
<td>Maximum Speed (X-axis)</td>
<td>40°/sec</td>
<td>34°/sec</td>
</tr>
<tr>
<td>Maximum Speed (Y-axis)</td>
<td>4.0 sec</td>
<td>4.9 sec</td>
</tr>
</tbody>
</table>

**MTI – Skyhook Positioner**
- Suited to heavier parts such as construction equipment frames
- Offset “Skyhook” design keeps part on center while tilting
- Thru-hole in faceplate for utilities

<table>
<thead>
<tr>
<th>MTI-1500</th>
<th>MTI-3000</th>
<th>MTI-5000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payload</td>
<td>1,500 kg</td>
<td>3,000 kg</td>
</tr>
<tr>
<td>Offset X, Y</td>
<td>272 mm, 180 mm</td>
<td>462 mm, 321 mm</td>
</tr>
<tr>
<td>Tilt</td>
<td>0-4.5 rpm</td>
<td>0-1.9 rpm</td>
</tr>
<tr>
<td>Rotate</td>
<td>0-6.5 rpm</td>
<td>0-2.7 rpm</td>
</tr>
<tr>
<td>Max L</td>
<td>1,500 mm</td>
<td>2,335 mm</td>
</tr>
<tr>
<td>Max Dia.</td>
<td>2,390 mm</td>
<td>3,600 mm</td>
</tr>
<tr>
<td>Torque (Static)</td>
<td>4,080 Nm</td>
<td>13,800 Nm</td>
</tr>
<tr>
<td>X, Y, Tilt</td>
<td>2,680 Nm</td>
<td>9,600 Nm</td>
</tr>
</tbody>
</table>