

Product Data Sheet

Robax-1000 Series Heavy-Duty Tilting, Indexing Turntables

The Robax™-1000 series are heavy-duty tilting and indexing turntables designed to withstand the rigors of thermal spray processing. Robax-1000 series are designed to precisely, accurately and repeatedly position parts. These turntables can be configured for integration with a robot, such that the Robax-1000 axes are external robotic axes and the programmed as part of the robotic motion program. The rotational speed is controllable for either clockwise or counterclockwise rotation.

The Oerlikon Metco Robax-1000 Tilting Turntable is designed to hold rotationally symmetrical workpieces such as shafts, turbine parts or other workpieces that must be rotated or positioned during the coating process.

Customers can choose from 4 models or Robax-1000 turntables:

Model	Tilt	No. of Axes
Robax-1000 ^a	no tilt	1
	0° to +90°	2
	-45° to +45°	2
Robax-1000-12S	0° to +90°	3

^a Standalone version can only tilt from 0° to 90°

The Robax-1000 is modular in its design. Customers can specify the type of tilting axis (automated, manual or none), the face plate diameter, the face plate configuration and face plate material of construction. In addition, options are available to expand the functionality of the Robax-1000.

Robax-1000 turntables have rotary and tilting axes are completely integrated and recognized as robotic axes (no tilt version has only a rotational axis). This makes the Robax-1000 suitable for a wide variety of applications. Thus, the rotational and tilt movements of the Robax-1000 are coordinated with the robot movements, allowing even geometrically complex surfaces to be coated.

The Robax-1000-12S has 12 satellite stations. When used in satellite mode, the turntable can index to each station, which in turn can be rotated clockwise or counterclockwise at a rotational speed set and controlled as a robot axis. Therefore, the Robax-1000-12S requires 3 robotic axes for full control. The Robax-1000-12S can also be used as a standard Robax-1000 when not in satellite mode.



Robax-1000
0° to +90°
Shown at 0° Tilt



Robax-1000
-45° to +45°
Shown at +25° Tilt



Robax-1000-12S
0° to +90°
Shown at 45° Tilt

1 General Description

1.1 Construction

The Robax-1000 series turntables consist of the following main components:

1. Chassis
2. Rotation unit
3. Tilt unit
4. Satellite rotation unit with serial measurement box (Robax-1000-12S only)
5. Face plate

Rotational and tilt movements allow for accurate and fast rotation and positioning of the workpiece. Various rotational drives are available, depending on the application. The tilt drive, available in 0° to $+90^\circ$ or -45° to $+45^\circ$ configurations, is designed for servo drive actuation and controlled as a robot axis. The Robax-1000 is also available without a tilt axis.

The Robax-1000-12S incorporates 12 satellite stations, each of which are addressed individually by indexing to the station. The rotation and speed of the satellite station is controlled as a robot axis.

The standard face plate is made of aluminum and precision manufactured with DIN T-slots for holding the workpiece. Face plates are also available in steel. Other face plate configurations are available on request.

1.2 Integrated Operating Modes

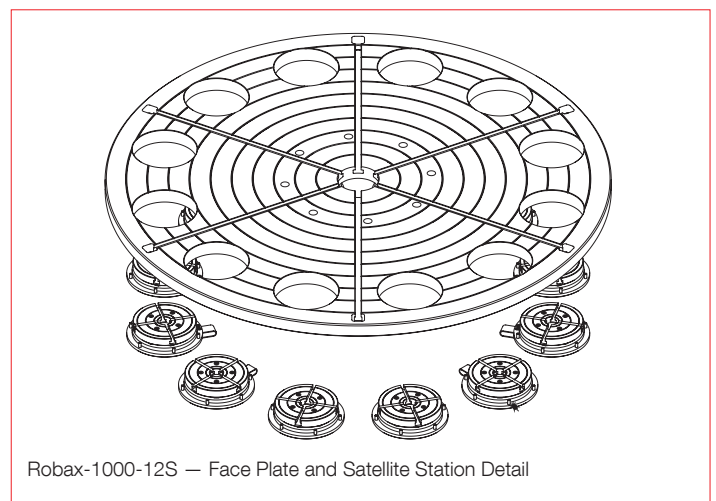
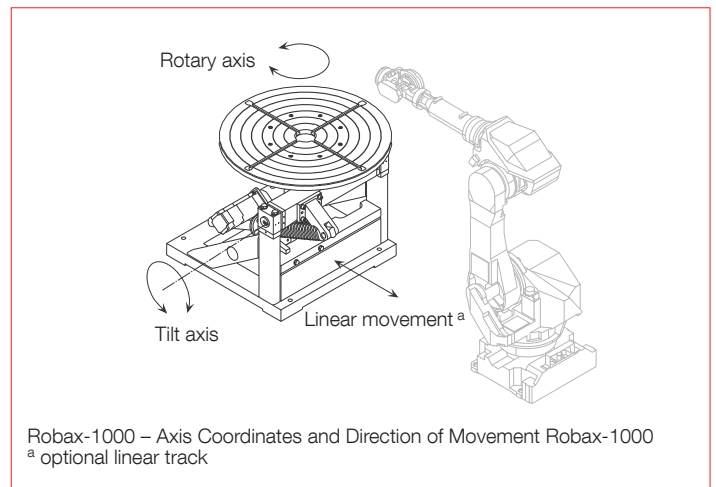
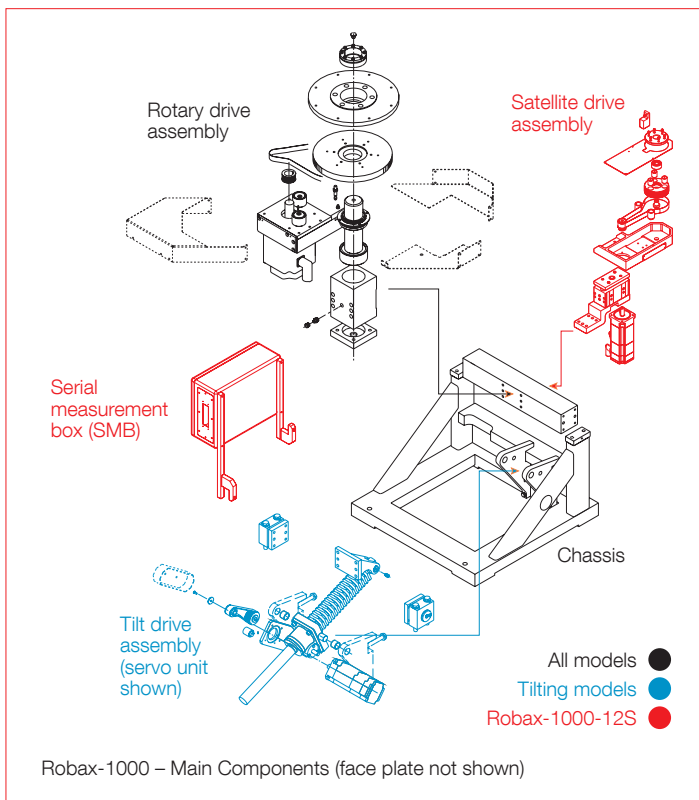
The rotary and tilting axes can be coordinated with the robot. Tilting can also be performed manually. Rotational axes can be rotated clockwise or counterclockwise. The movement of the rotary and tilting axes can be programmed in either “teach” or off-line mode, depending on the control mode.

The specific modes are:

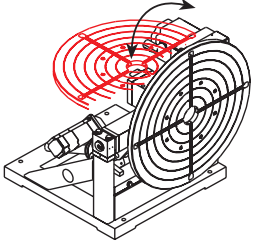
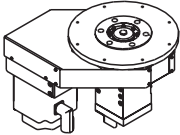
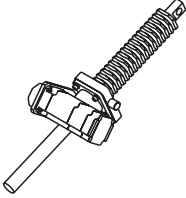

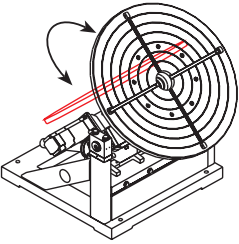
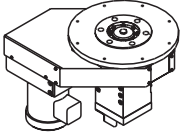
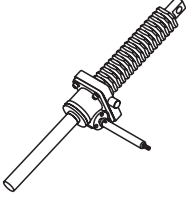
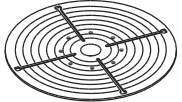
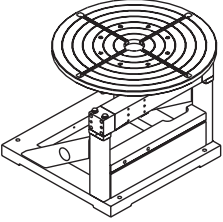
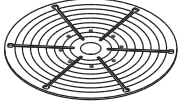
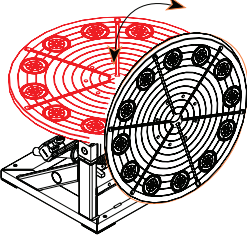
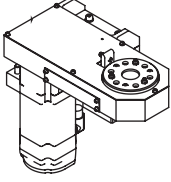
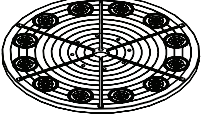
- Positioning at a predefined angle. The angle of the face-plate is coordinated with the movement of the robot axes.
- Face plate rotated at a predefined speed. The robot controller starts the motion program at a predefined speed. The robot software allows a free choice of speeds.
- Satellite mode (Robax-1000-12S only). The turntable indexes to each satellite station and the station can be rotated clockwise or counterclockwise at a predefined speed. Indexing is also supported for each station.

1.3 Standalone Version

A standalone, manually-operated version of the Robax-1000 is available, which requires an optional control box (See Section 3). Tilt on this version is from 0° to 90° and rotational speed is limited from 30 to 300 rpm.



1.4 Overview of Configuration Options

Tilt Range	Rotational Drive	Tilt Drive Type	Face plates
 <p>0° to +90°</p>	 <p>Various Main Rotational Drive Types</p>	 <p>Automated Tilt Drive, Using Various Drive Types</p>	 <p>4 DIN T-Slots Ø 800 mm (31.5 in) Aluminum: 40 kg (88 lb) or Steel: 95 kg (209 lb)</p>
 <p>-45° to +45°</p>		 <p>Manual Tilt</p>	 <p>4 DIN T-Slots Ø 1000 mm (39.5 in) Aluminum: 60 kg (132 lb)</p>
 <p>Without Tilt</p>			 <p>6 DIN T-Slots Ø 1000 mm (39.5 in) Aluminum: 60 kg (132 lb)</p>
 <p>0° to +90° Robax-1000-12S</p>	 <p>Satellite Rotational Drive Robax-1000-12S only</p>		 <p>6 DIN T-Slots with 12 Satellite Stations Ø 1200 mm (47.25 in) Aluminum: 105 kg (231 lb) Robax-1000-12S only</p>

Note: Weight of the face plate must be subtracted from the total load bearing capacity of the turntable to get the maximum allowable part weight.

2 Features and Benefits

Effective

- Stable rotational part handling for thermal spray systems
- Allows clockwise or counterclockwise rotation, indexing and tilt
- Rotational speed control
- Manual or automated tilt modes with servo drive rotation
- Variety of face plates available to suite specific part handling requirements

Environmental

- Zero-speed monitoring warns operator is the motor is turning but the face plate is not turning
- Over-tilt monitor prevents the turntable from tilting beyond its specified range
- Heavy-duty anchor system prevents tipping and ensures perfect stability
- Full integration into the E-stop circuit of the thermal spray system ensures operator safety

Efficient

- Accepts parts as heavy as 1000 kg
- Positioning accuracy within $\pm 0.1^\circ$
- Maximum moment of inertia of $90 \text{ kg}\cdot\text{m}^2$
- Models available with tilt angles of -45° to $+45^\circ$ and 0° to $+90^\circ$ with accuracy of $\pm 0.5^\circ$ (no tilt model also available)
- Satellite version (Robax-1000-12S) for efficient batch processing of smaller parts (speed control for clockwise and counterclockwise satellite station rotation, satellite station indexing)
- Robot teaching tool allows quick set up of motion program and aids in calibration

Economical

- Long life parts require little to no maintenance with bearings designed to last for 16,000 hours
- Modular construction allows for simple and cost-effective upgrades and changes

3 Options and Accessories

Manual chuck attachment

The manual chuck attaches to the faceplate for easy mounting and coating of small, rotationally symmetrical workpieces.

Manual chuck

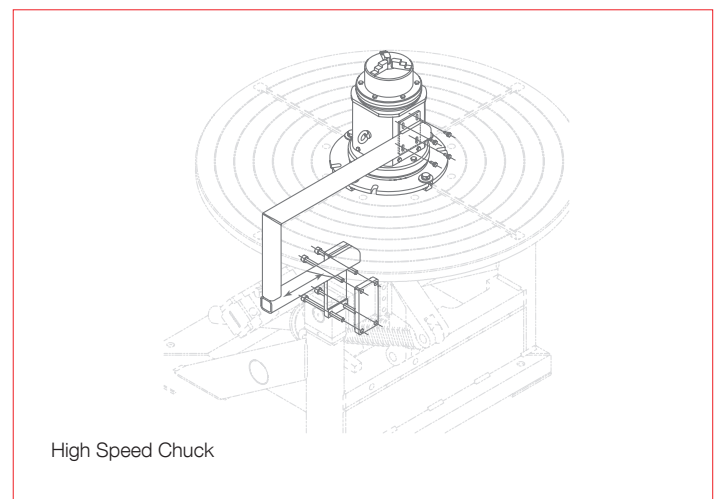
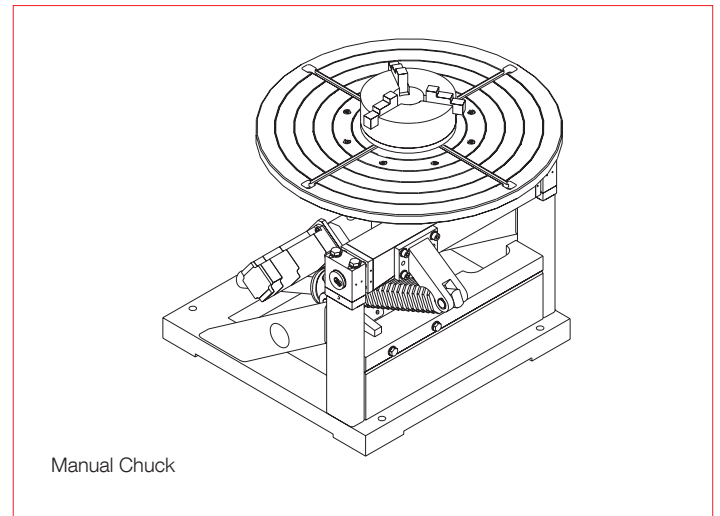
Chuck capacity	5 to 250 mm	0.19 to 9.84 in
max. workpiece mass	50 kg	110.23 lb
max. mass moment of inertia	$0.75 \text{ kg}\cdot\text{m}^2$	$17.8 \text{ lb}\cdot\text{ft}^2$

High-speed chuck attachment

The high-speed chuck attachment allows workpieces to be coated at higher rotational speeds.

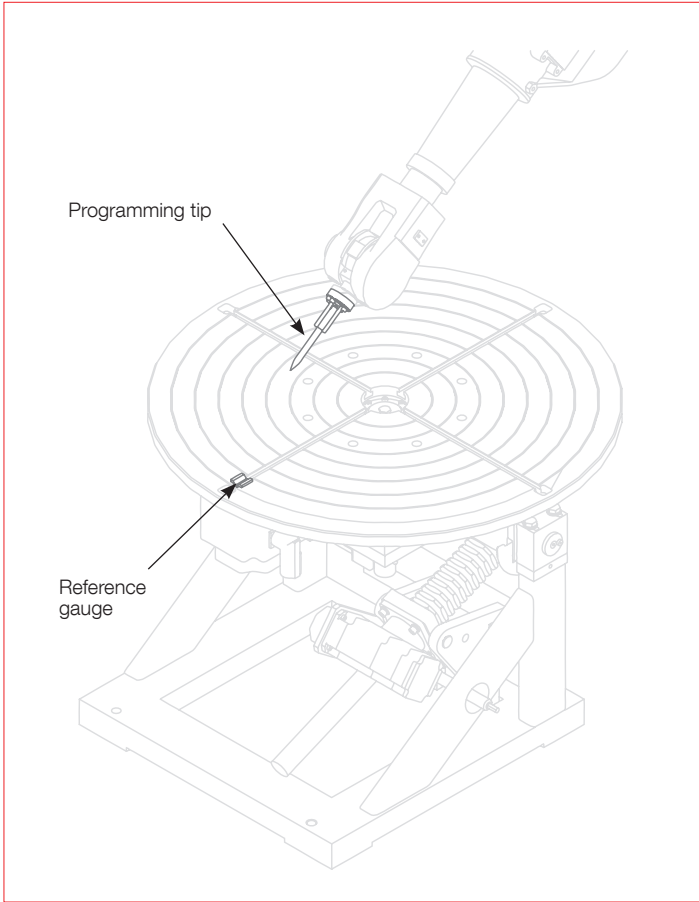
High speed chuck attachment

Rotational speed	35 to 2100 rpm	
Chuck capacity	3 to 125 mm	0.12 to 4.92 in
max. load (depending on rpm)	25 kg	55.12 lb
max. mass moment of inertia	$0.075 \text{ kg}\cdot\text{m}^2$	$1.78 \text{ lb}\cdot\text{ft}^2$



Programming Tip and Reference Gauge

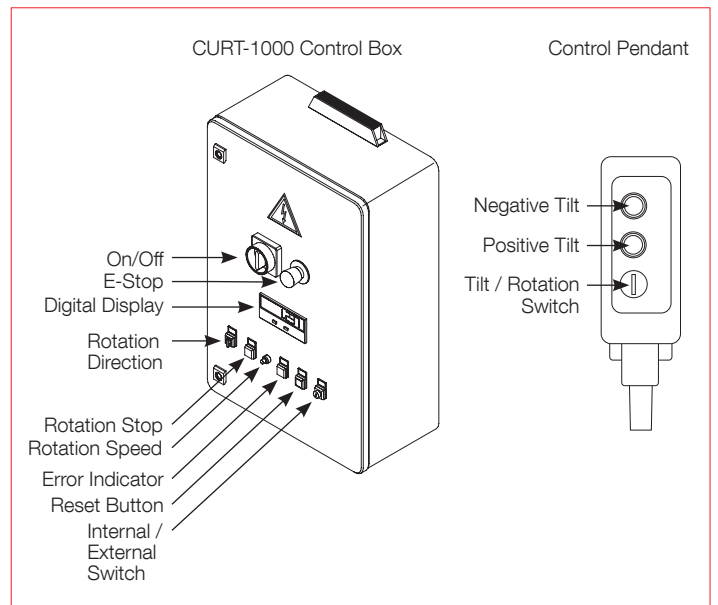
The programming tip and reference gauge locate the position of the turntable face plate within the coordinate system of the robot.



CURT-1000 Control Unit

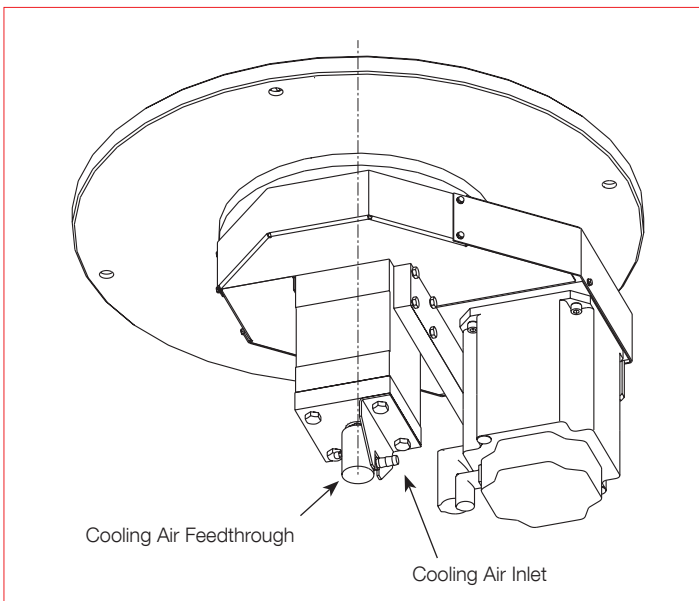
The CURT-1000 is required for the manually-operated, standalone version of the Robax-1000. The CURT-1000 controls the turntable on/off, rotational speed, rotational direction (clockwise / counterclockwise) and the tilt angle. A digital display shows the rotational speed of the turntable and displays error codes. An internal / external switch allows the customer to integrated the CURT-1000 with the customers own equipment. An additional control pendant with a 10 m (33 ft) cable controls the tilt angle.

The CURT-1000 is equipped with an E-stop button and circuitry designed or integration with the E-stop circuit of the spray system.



Cooling Air Duct

The optionally available cooling air duct provides inner workpiece cooling.

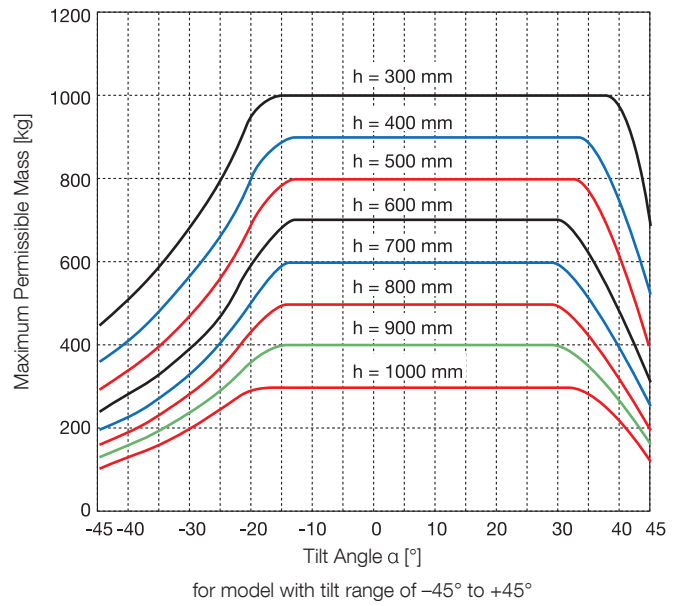
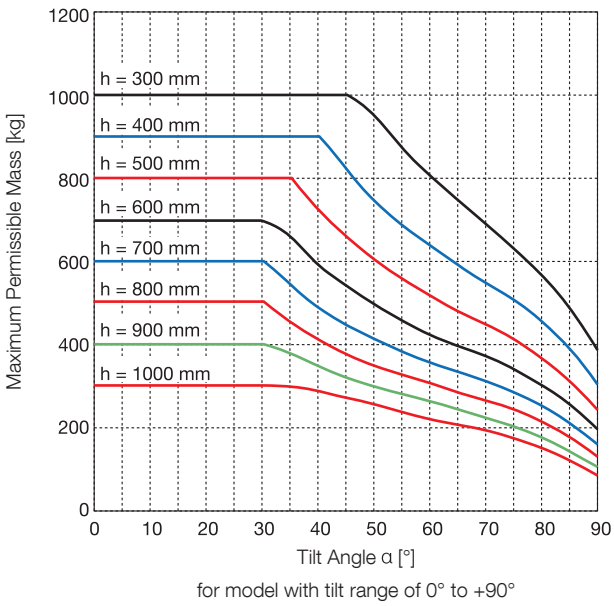
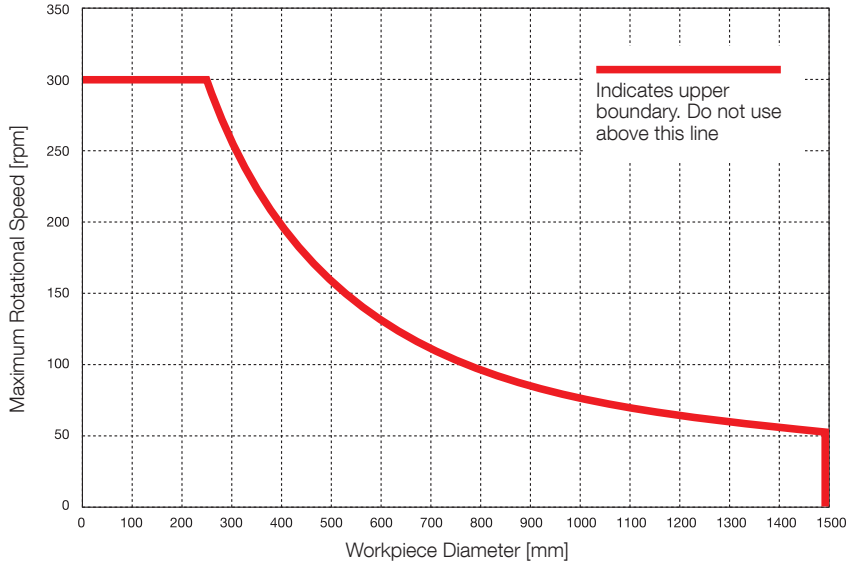


Oerlikon Metco also offers a wide range of additional options and accessories, as well as customized features on request.

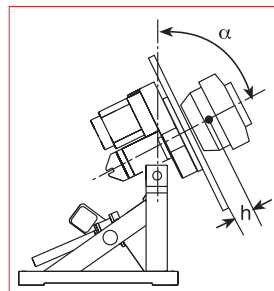
4 Technical Data

4.1 Operating Regions

This diagram indicates the maximum permissible rotational speed in relationship to the workpiece diameter.

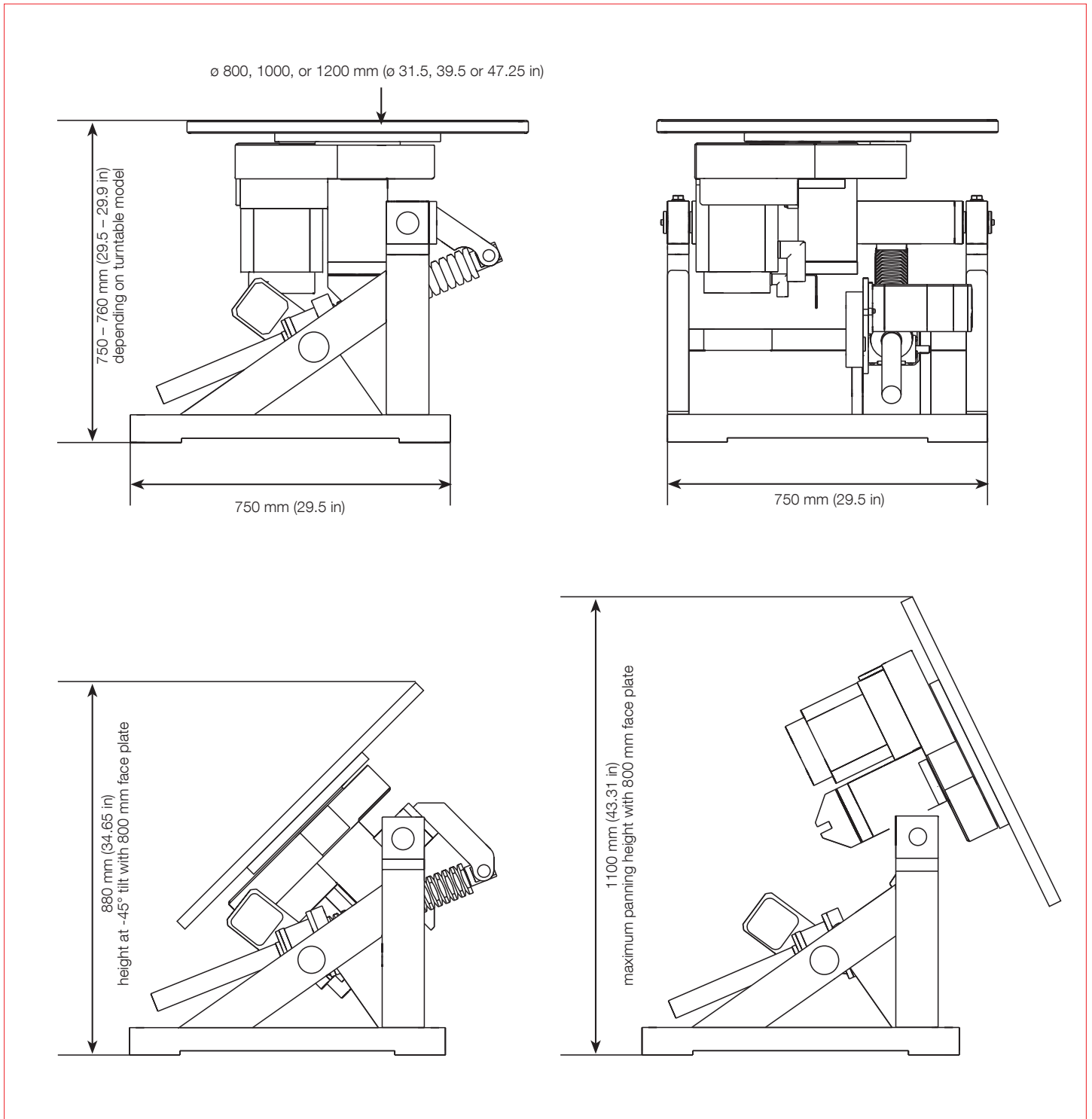


The load and tilt charts show the maximum load as a function of tilt angle “α” and the height “h” of the center of gravity of the workpiece to the center of the face plate.



α = Tilt angle
h = Height of the workpiece center of gravity to the center of the face plate

4.2 Dimensions



4.3 Specifications

Weight and Payload

Total Weight	460 kg	1014 lb
Max. Payload ^a	1000 kg	2204 lb
Max. Payload with Satellites (Robax-1000-12S only)	300 kg	661 lb
Max. Moment of Inertia — Rotational Axis	90 kg·m ²	2136 lb·ft ²
Installation Type	heavy duty ground anchors	

Axes

Rotational		
Rotational Direction	clockwise or counterclockwise	
Min. Rotational Speed ^b	5 rpm	
Rotational Speed ^b	5 to 300 rpm	
Rotational Speed Precision ^{b, c}	± 1°	
Max. Acceleration ^{b, c}	19 rpm/s ²	
Acceleration Time to Max Rotational Speed ^b	16 s	
Positioning Accuracy ^b	± 0.1°	

Tilt Motion		
Tilt Range	-45° to +45° or 0° to +90° or no tilt	
Tilt Time – Full Range	55 s	
Tilt Positioning Accuracy ^b	± 0.5° (± 2° manually)	
Tilt Positioning Repeatability ^b	± 0.1° (± 2° manually)	

Satellite Rotational (Robax-1000-12S only)		
Rotational Direction	clockwise or counterclockwise	
Min. Rotational Speed ^b	5 rpm	
Max. Rotational Speed ^b	1000 rpm	
Rotational Speed Precision ^{b, c}	± 1°	
Positioning Accuracy ^b	± 0.2°	

Drive Data

Rated Torque – Rotational Drive ^b (Pre-Transmission)	36 Nm	26.5 lbf-ft
Rated Torque – Tilt Drive ^b (Pre-Transmission)	4 Nm	2.95 lbf-ft
Power Consumption – Rotational Drive ^b	5.37 kW	
Power Consumption – Tilt Drive ^b	1.41 kW	

Environmental Conditions

Temperature	+10 to +40 °C	+50 to +104 °F
Humidity	< 75%; non-condensing	

^a Limited by the weight of the workpiece, the distance between the center of gravity of the turntable with the workpiece, the allowable tilt angle and rotational speed (see section 4.1 Operating Regions).

^b Applies to the standard configuration with Siemens drive motors. Data for other configurations provided on request. Standalone Robax-1000 model rotational speed limited to 30 to 300 rpm.

^c For faster acceleration and/or more precise positioning, please contact Oerlikon Metco.