



# PreciseFlex™ 400 Sample Handler

PreciseFlex™ Collaborative Robotics

## Benefits

- Helps provide consistent and accurate results
- Automates complex workflows and assays
- Allows scientists and technicians to focus on data analysis
- Improves productivity and quality
- Increases throughput reliably
- Unique design reaches in tight spaces
- Removes human handling errors
- Can operate inside a fume hood
- Low force operation keeps expensive instruments safe
- Runs experiments safely in close proximity to technicians
- Environmentally friendly low power consumption
- Can operate unguarded 24/7

## World's First Collaborative Sample Handler

The PreciseFlex™ 400 is the world's first inherently safe laboratory automation sample handler. Unlike many other collaborative sample handlers, that are inherently dangerous robots operating in a collaborative mode, the PreciseFlex™ 400 was specifically designed to limit all collision forces. It will not injure users or equipment even if it collides with them at full speed. This eliminates the need for expensive safety shields and permits the sample handler to operate safely side-by-side with personnel. Due to its revolutionary combination of safety, capabilities and performance, the PreciseFlex™ 400 is currently being employed in environments where automation could never go before: working on desktops of analytical labs, in mixed manufacturing assembly applications side by side with operators and in clinical diagnostic environments.

This low-cost, quiet OEM sample handler has its controller, harnesses and power supplies embedded within its structure to eliminate extra enclosures and simplify installation. This space saving design, together with a novel geometry, allows the PreciseFlex™ 400 to service many stations in an extremely small workcell. Combined with absolute encoder servo motors, which do not require any motion to home during start-up, and the collaborative aspects of the sample handler, which eliminate the need for barriers, the PreciseFlex™ 400 significantly reduces the size and cost of an automated cell. The lightweight PreciseFlex™ 400 can be carried by one person, mounted on a table and, by plugging in just an AC power cord and an Ethernet cable, is ready to operate.



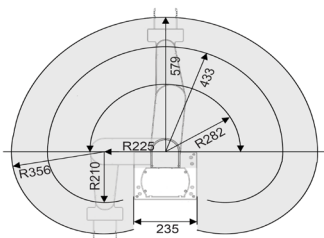
PreciseFlex™ 400

*TUV  
Certified  
Collaborative  
Robot  
Forces*

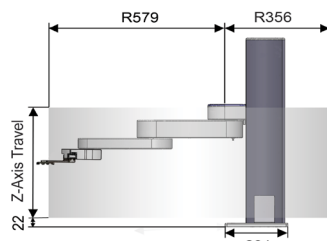
The PreciseFlex™ 400 comes standard with a servo gripper that can grip Life Science microplates in both portrait and landscape orientations. Additional the squeeze force of the gripper can be controlled and set to close on a plate between 0.5N to 23N and open with 0.5 to 10N. The gripper also includes a spring return to protect against dropping parts when the robot is powered down or e-stopped. Additionally advanced features include part detection using the gripper's force control and encoder feedback as well as horizontal compliance mode to compensate for changes to positions via bumping or human error. Finally, options include gripper fingers and special servo grippers for handling vials and test tubes.

**Product Specifications**

<b>Range of Motion &amp; Resolution</b>	J1 (Z) Axis	400 mm standard, 750 mm or 1160 mm options available
	J2 Axis	+/- 93 degrees
	J3 Axis	+/- 168 degrees
	J4/Theta Axis	+/- 960 degrees
	Gripper	Standard servo gripper can grip Life Science plates in both portrait and landscape orientations. Software can control squeeze force (between approximately 0-23N for close force, 0-10N for open force) and open/close speed. Safety features include: (1) protection against dropping parts when the robot is powered down or e-stop pressed (gripper provides 7-10N of close force when motor power is off) and (2) detection of when a part is being held by the gripper. Options include gripper fingers and special servo grippers for handling vials and test tubes.
	Maximum Reach	Standard Reach Version: 433 mm (579 mm with gripper) Extended Reach Version: 588 mm (734 mm with gripper) Servo gripper with standard fingers: 146 mm
Repeatability	+/- 90 µm overall in x, y & z directions at 18-22 degrees C	
<b>Performance and Payload</b>	Maximum Acceleration	0.2G with 500 gm payload (standard reach)
	Maximum Speed	500 mm/sec with 500 gm payload (standard reach)
	Maximum Payload	1 kg (500g with gripper)
	Motors	Brushless DC servo motors with absolute encoders on axes J1-J4, no motion during homing.
	TUV Certified Collaborative Forces	All PreciseFlex™ collaborative robots have been measured by TUV and certified to exert forces that fall within the force guidelines for collaborative robots as defined by the recent ISO/TS 15066 Standard on Collaborative Robots. Even maximum speed collisions in free space are well under the ISO force limits for operator safety. However, in order to use a robot in an application without safety shields, the application as a whole (including end effectors, operation methods, objects being handled and obstacles in the workcell) must be evaluated for safety. For more information on the evaluation of applications and workcells without safety shields, please contact Brooks Automation.
<b>Interfaces</b>	General Communications	RS-232 channel, 10/100 Mbps Ethernet port, E-stop input, all available on J1-Axis housing Facilities Panel at the robot base
	Digital I/O Channels	One optically isolated input available on J1-Axis housing Facilities Panel. Option available for an additional 12 optically isolated digital inputs and 8 optically isolated digital outputs on J1-Axis housing Facilities Panel.
	Operator Interface	Web based operator interface supports local or remote control via browser connected to embedded web server
	Programming Interface	Three methods available: GPL, TCP/IP Command Server, GuidanceMotion (a web-based drag-and-drop interface for simple applications).
<b>Linear Rail Option</b>	Configurations	Any model of the PreciseFlex™ 400 can be mounted on the Linear Rail with all of the robot's interfacing cables routed internally in the Rail.
	Repeatability	+/- 50 µm
	Maximum Speed	700 mm/sec
	Dimensions	1 M travel version – 1.37 m long x 0.23 m deep x 0.12 m high 1.5 M travel version – 1.87 m long x 0.23 m deep x 0.12 m high 2 M travel version – 2.37 m long x 0.23 m deep x 0.12 m high
	Weight	30 kg for 1000 mm 45 kg for 1500 mm 60 kg for 2000 mm
<b>Required Power</b>		Input range: 90 to 264 VAC, single phase, 50-60 Hz, 365 watts maximum
<b>Weight</b>	Weight	20 kg for 400 mm travel version 25 kg for 750 mm travel version 30 kg for 1160 mm travel version



Standard Reach Version



Standard Reach Version



PreciseFlex™ Sample Handler on Linear Rail

For more information, please contact your local Brooks Automation sales representative or visit [www.brooks.com](http://www.brooks.com).

