



# PreciseFlex™ 3400 Industrial Collaborative Scara Robot

PreciseFlex™ Collaborative Robotics

## Benefits

- Increases Workforce Productivity and Capacity
- Provides consistent and reliable quality
- Helps Address Labor Shortages
- Works Unguarded 24/7
- Operates safely next to your workforce
- Ease of use enables fast solution implementation
- Saves space and reduces wiring with controls inside the robot
- Quickly programmed via web interface
- Flexible solutions can be created using the very powerful programming language
- Saves floor space with unique cylindrical working volume
- Easily reaches into shelves and tight spaces
- Can be moved easily because of light weight

## The World's Safest/Fastest Collaborative Robot

The growth of collaborative robots that can safely work side-by-side with people makes automation accessible to a new generation of applications. However, this accessibility has come at the cost of reduced cycle time, higher prices and the loss of features.

The PreciseFlex™ 3400 is the world's first collaborative four-axis SCARA robot. Its inherently safe design allows the PreciseFlex™ 3400 to achieve speeds and accelerations much faster than any other collaborative robot while still limiting forces, making the PreciseFlex™ 3400 the world's fastest/safest robot. This distinctive SCARA design can perform a 300 mm (1ft) by 25 mm (1inch) pick-and-place cycle time test in 1.4 sec, only slightly slower than many non-collaborative industrial robots and comparable to human operators. Even at the fastest speeds, the PreciseFlex™ 3400 limits free space collision forces to under 100N.

Collaborative robots potentially allow for the creation of a mixed manufacturing environment where people can enter and efficiently work around robots without the loss of throughput. However, most "collaborative" robots must move slowly or use a reduced speed collaborative mode, losing productivity whenever users are near. The PreciseFlex™ 3400's unique combination of speed/safety allows it to operate at full speed and deliver industrial throughput in applications where operators can move freely around the robot without concerns for their safety or impacting production.

In addition to offering a competitive price comparable to non-collaborative robots, the PreciseFlex™ 3400's unique mechanical design is optimized for collaborative table top applications. This lightweight robot 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. The controller, power supplies and harnessing are embedded within the robot's structure, eliminating external controller cabinets and simplifying installations. Due to its novel configuration, the PreciseFlex™ 3400 can work in cells with very compact foot prints while providing the extraordinary vertical reach of up to 1.2M.

To simplify setup for new users, many collaborative robots use a programming environment with limited features. PreciseFlex™ collaborative robots offer the flexibility of both an easy to use web based interface as well as an optional advanced programming environment as capable as any industrial robot. The easy to use Guidance Motion interface is accessible from any web enabled device and allows technicians or operators to quickly and easily setup and teach the PreciseFlex™ 3400 to perform real work.

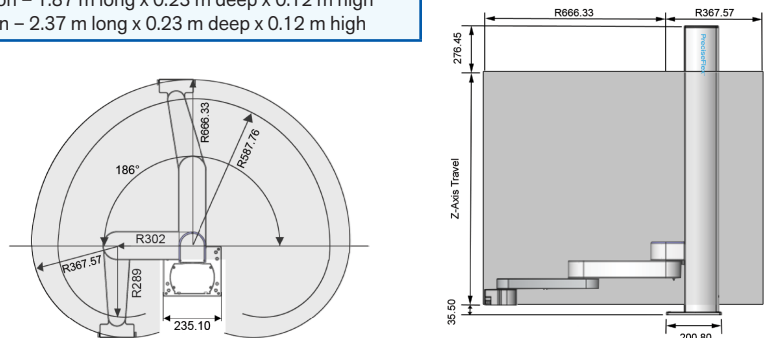


PreciseFlex™ 3400

*Meets  
ISO Force  
Standards for  
Collaborative  
Robots*

**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 with servo; +110/-470 degrees with mounting flange  |   |
|   | Optional servo gripper (J5)  | 43 mm travel (101 to 144 mm at finger mounts)   |   |
|   | Gripper  | Robots purchased without a gripper include a standard ISO mounting flange. Pneumatic facilities for single or dual valve grippers are optionally available. In addition, an optional integrated servo gripper is available. The servo gripper has 40 mm of travel and can be outfitted with user developed fingers for holding a variety of different size parts. Software can control squeeze force (between approximately 0-46N for close force, 0-30N for open force) and open/close speed. Safety features include: (1) protection against dropping parts when 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. |   |
|   | Maximum reach  | Without gripper   | 587.76 mm to center of flange                                 |
|   |  | With gripper  | 666.33 mm to end of finger mounts                             |
| Repeatability                           | +/- 90 µm overall in x, y & z directions at 18-22 degrees C  |   |   |
| <b>Performance and Payload</b>          | Maximum Acceleration   | 2000 mm/s <sup>2</sup> with 1 kg payload  |   |
|   | Maximum Speed  | 500mm/sec in Z, 1,500mm/sec in horizontal plane with 1kg payload  |   |
|   | Maximum Payload  | 3kg including gripper, 2.5kg with typical 0.5kg gripper   |   |
|   | Motors   | Brushless DC servo motors with absolute encoders on axes J1-J4, no motion during homing.  |   |
|   | Collaborative Forces   | All PreciseFlex™ collaborative robots 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.   |   |
|   | General Safety   | Robot has designed in Category 3 safety features including dual independent E-stop channels as a standard feature   |   |
|   | Cycle Time   | 25 x 300 x 25 mm pick and place cycle with 1 kg payload: 1.4 sec  |   |
| <b>Interfaces</b>                       | General Communications   | Facilities panel  | 10/100 Mbps Ethernet port, RS-232, dual channel E-Stop inputs |
|   |  | End of arm (with gripper)   | RS-232  |
|   |  | End of arm (without gripper)  | (None)  |
|   | Digital I/O Channels   | Facilities panel  | 8 in, 8 out   |
|   |  | End of arm (with gripper)   | 1 in, 1 out (or RS-232)                                       |
|   |  | End of arm (without gripper)  | 2 in, 4 out   |
| Air Lines                               | Air lines (3.2 mm OD, 1.7 mm ID) are provided when optional pneumatic facilities for single or dual valve grippers are ordered     |   |   |
| 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™ 3400 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<br>1.5 M travel version – 1.87 m long x 0.23 m deep x 0.12 m high<br>2 M travel version – 2.37 m long x 0.23 m deep x 0.12 m high  |   |
| <b>Required Power</b>                   | Input range: 90 to 264 VAC, single phase, 50-60 Hz, 365 watts maximum  |   |   |
| <b>Weight</b>                           | 20 kg for 400 mm travel version  |   |   |



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

