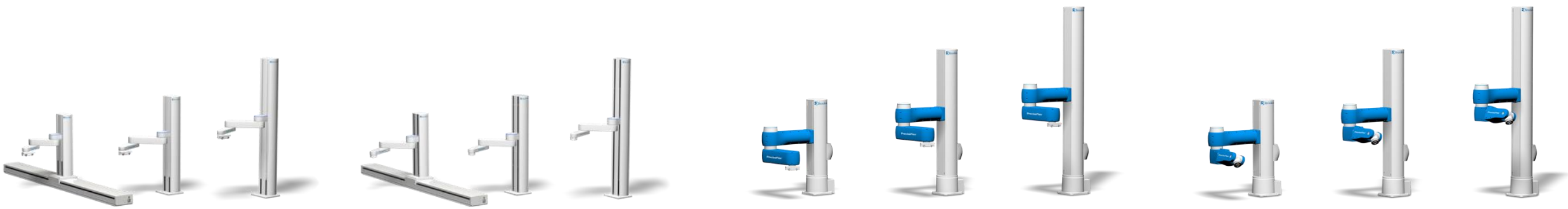
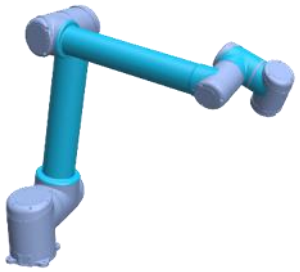
PreciseFlex Collaborative Robots

Differentiation



Highest Throughput of any collaborative robot



Most Collaborative Robots are gravity loaded and require HDs to lift the arm

Traditional Collaborative Robots

- Move most axes **vertically**, against gravity
- Use Harmonic Drives to lift the arm against gravity
- Have gear ratios of 150:1 or higher, resulting in higher reflected inertia (often 1,000 times more than PreciseFlex)
- Must move slower and accelerate at lower rates to be collaborative*
- Harmonic drives are also a wear item and a failure point

PreciseFlex Robots

- Move the primary axes **horizontally**
- Have very low gear ratios, 1:1 or 5:1
- Have very low reflected inertia
- Can move and accelerate at higher rates and still be safe*

The Fastest and Safest

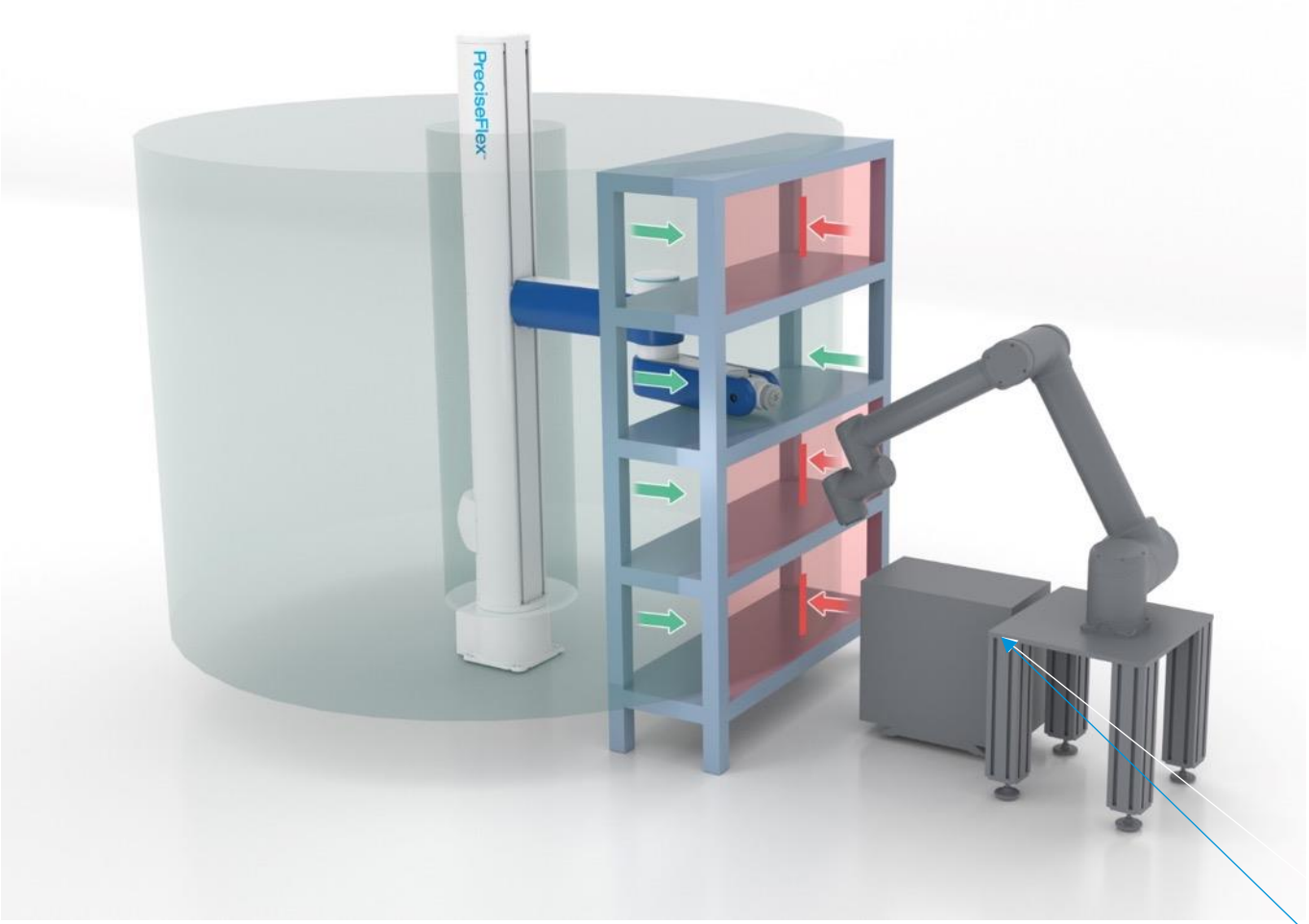
*Always perform a risk assessment based on the end use application

Highest Workspace Density

Our **Vertical Column Envelope** offers the best workspace utilization

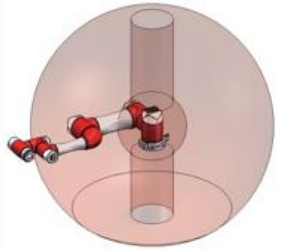
Ideal for going vertical and reaching into shelves and machines

With embedded controls and no bulky robot cables to deal with, PreciseFlex robots offer even more space savings

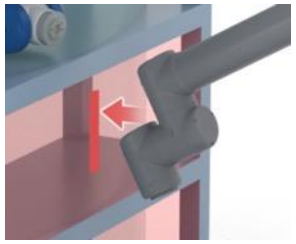


The Highest Machine Density Available

Traditional Collaborative Robots have spherical envelopes with restricted vertical reach and limit workspace utilization



A bulky wrist on other robots prevents them from reaching into narrow shelves or racks



They also have bulky external controllers and robot cables

Highest Workspace Density

Smallest Footprint

ALL PreciseFlex robots have **Embedded Controls**

Embedded Controls

Collaborative Linear Rail extends robot reach by up to 2.0M

Collaborative Linear Rail

Ideal for Mobile Robot Applications

PreciseFlex 100 is a bolt on **Collaborative Cartesian Robot** ideal for attaching to conveyors. Includes embedded controls.

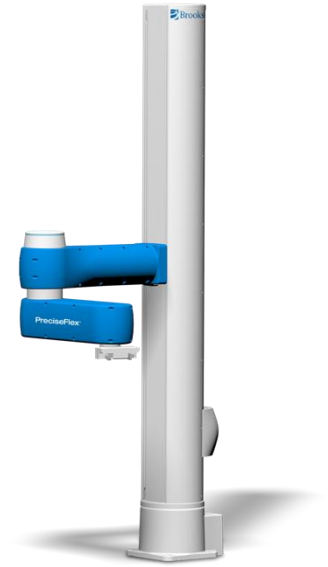
PreciseFlex 100

Most Reliable

Our robots are incredibly reliable

40,000 hours design life

- PreciseFlex Robots have an **MTBF of 125k hours**
  In aggregate of 4,000+ robots deployed over 10 years
- **Design Life of 40,000 hours** for PreciseFlex 400 and 3400 Robots
  The highest of any standard cobot, 2 shifts/day for 10 years
  The next generation robots will use direct drive motors, in place of belt driven axes
- **Design Life up to 100,000 hours** for PreciseFlex DD 4 which uses our patented Direct Drive Motors, 2 shifts/day for 25 years. DD 6-axis robot requires wrist maintenance at 20-40,000 hours due to harmonic drives.
- By contrast, few companies publish MTBF or design life data. Typical life for harmonic drives is 20,000 hours.
- Tired of ongoing retrofits and recall notices to overcome substandard reliability? Try PreciseFlex robots.

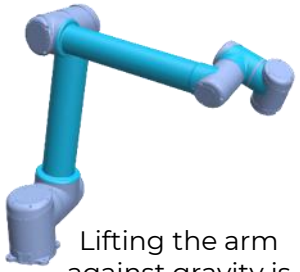


100,000 hours design life

Most Energy Efficient

Logicbus

67% LESS POWER!



Lifting the arm against gravity is very inefficient

Traditional Collaborative Robots

- Lift major axes **vertically**, against gravity, so constant gravity load
- Use Harmonic Drives which waste ~20% of power
- Wasted power dissipated as heat compounds with the need to increase AC for climate-controlled facilities

PreciseFlex Collaborative Robots

- 100 ~ 150W for moving payload at rate
- Are ideal for Mobile Applications
  - No loss of power converting DC-AC-DC*
  - Less expensive solution
  - Less mass
  - Longer AMR runtime
  - = Better ROI
  - Up to 15% additional power savings with DC Power Option

*Contact us about the DC Power Option

Most Energy Efficient

6 PreciseFlex robots running on a single 20A circuit

Up to 12 PreciseFlex 400 and 3400 robots run on a 20A circuit

Primary Differentiation Summary

Logicbus Brooks

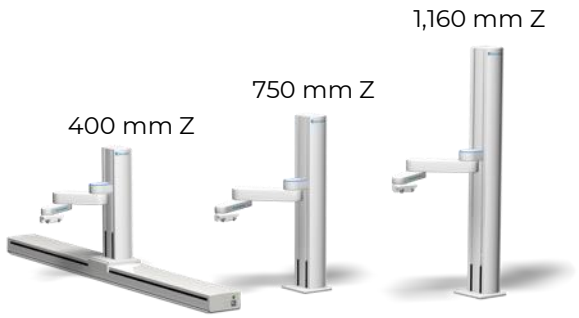
Highest Throughput
Highest Workspace Density
Most Reliable
Most Energy Efficient

The best ROI
of any cobot

Support and backing of Brooks Automation

- Global Presence in 40+ countries
- 43,000 sq ft production facility in Livermore, CA
- Standard deliveries of 6-8 weeks

PreciseFlex Range of Products

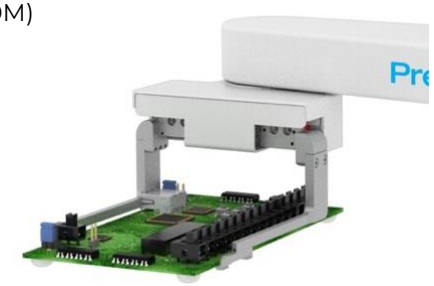


PreciseFlex 400 Sample Handler
For Lab Automation

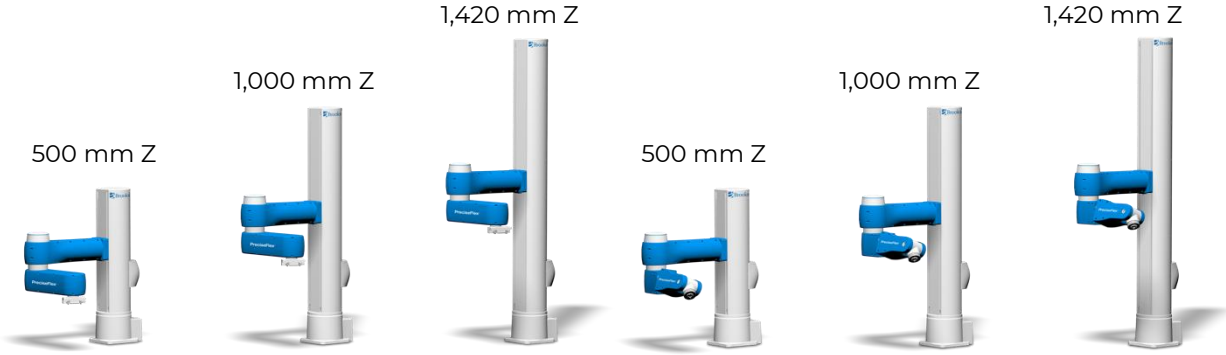
PreciseFlex 3400
(3 kg payload)

Collaborative Linear Rail Optional
(1.0, 1.5 and 2.0M)

23N Servo Gripper Included

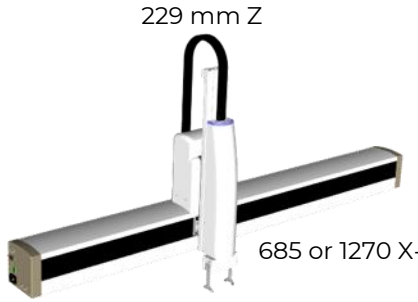


Servo Gripper Optional
23N, Dual 23N, 60N



PreciseFlex c10
4-axis robot
(10 kg payload*)

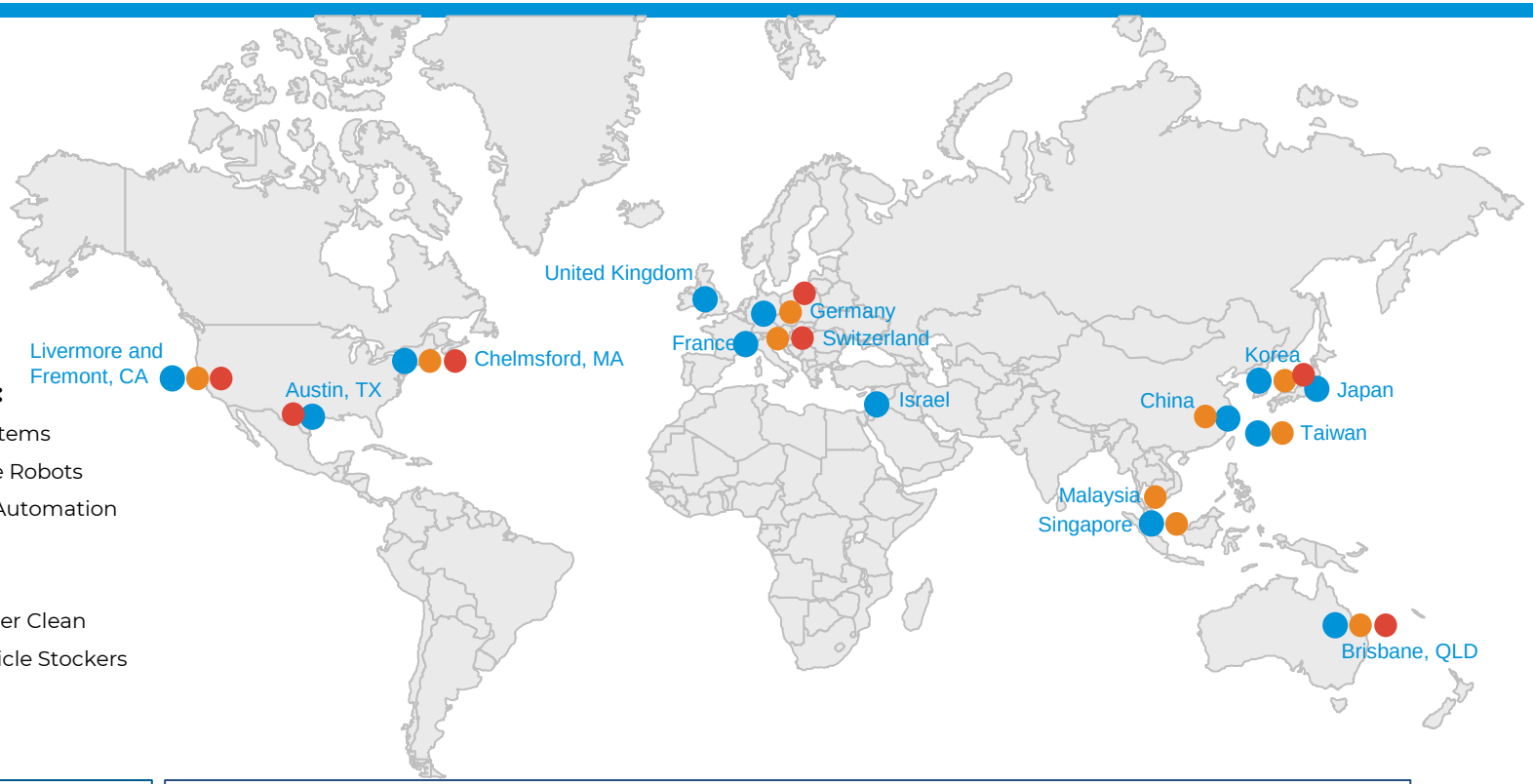
PreciseFlex c8A
6-axis robot
(8 kg payload)



“bolt on” robot

PreciseFlex 100 XZT Cartesian
(3-6 kg payload)

About Brooks Automation



Engineering Locations:

Chelmsford, MA – Robots, Systems

Livermore, CA – Collaborative Robots

Brisbane, QLD – PathFinder Automation

Fremont , CA – Systems

Austin, TX - Systems

Steisslingen, Germany – Carrier Clean

Tagerwilen, Switzerland – Reticle Stockers

Seoul, Korea – Systems

- ***Sales Office***
- ***Manufacturing Locations***
- ***Engineering Locations***

Manufacturing Locations:

Chelmsford, MA – Robots, Systems, Robot Repair

Livermore, CA – Collaborative Robots, Robot Repair

Brisbane, QLD – PathFinder Automation

Steisslingen, Germany – Inspection stations

Tagerwilen, Switzerland – Reticle Stockers

Seoul, Korea – Systems, Robot Repair

Suzhou, China – Systems, Robot Repair

Singapore – Sorter, SMIF (Flex – CM[1])

Senai, Malaysia – RFID (Flex – CM[1])

Hsinchu, Taiwan – CCS (MIC – CM[1])

Germany and China – CCS (Manz – CM[1])

#1	in Vacuum Automation Robots & Systems in Carrier Cleaners & Reticle Stockers in Advanced Packaging Process Automation **in Lab Automation Collaborative Robotics**
100,000+	**Robots deployed** in Semiconductor, Lab Automation and General Industry
1,700+	Employees (300 in R&D, 300 Service Engineers)
Global	Customers in 30 countries