

Absolute Accuracy Industrial robot option



Make a real robot an ideal robot

Maintain the accuracy of your robot cell from installation, through motor exchange, fixture realignment and other activities, during the entire robot lifetime. Absolute Accuracy bridges the gap between real robots on the factory floor and the virtual robots in your CAD environment. Absolute Accuracy comprises compensation of mechanical properties as well as deflection due to load.

Production downtime is minimized because Absolute Accuracy makes your robots exchangeable. Consistency between robots means you can simply replace one robot with another without sacrificing accuracy.

With Absolute Accuracy you can install and run a perfectly accurate robot. To ensure consistent results, the same

toolkit is used from calibration and verification at the ABB production center, through installation and maintenance on site. A "Calibration Guideline" offers help for installation and maintenance activities to ensure an optimal result. The accuracy of your robot is guaranteed in its entire working envelope.

Shorter turnaround times

Absolute Accuracy eliminates the discrepancy between the real robot and the virtual robot, thus ensuring simulation accuracy and reducing commissioning time.

Absolute Accuracy

Product concept

The difference between a virtual robot and a real robot can be typically 8-15 mm, resulting from mechanical tolerances and deflection in the robot structure. The Absolute Accuracy concept bridges this gap with a complete accuracy concept for the entire robot lifetime, ensuring a maintainable accuracy of approx 0,5 mm in the entire working range.

Controller algorithms

Inherent mechanical tolerances and deflection due to load in the robot structure decrease the robot's absolute accuracy. Practical compensation of such errors is a complex and highly non-linear problem. The ABB solution is to compensate positions internally in the controller, resulting in a defined and measurable robot TCP (Tool Center Point) accuracy. A generic robot model is used for each robot family and robot individuals are described by a set of compensation parameters, determined at ABB Robotics. Accuracy of each robot will be ascertained and verified through the "Birth Certificate" which statistically describes the robot accuracy in a large sample of robot positions.

CalibWare

The PC based software tool CalibWare connected to an appropriate 3D measurement system, is used for calculating the correct compensation parameters. CalibWare is used both for the original factory calibration and for field calibration, should this be needed. In this way consistent absolute accuracy can be maintained throughout the total robot life cycle.

Accuracy examples

Robot type	Position accuracy (typical production data)		
	Average (mm)	% within 1 mm	Maximum (mm)
IRB 140	0.35	100	0.75
IEB 1600	0.30	100	0.65
IRB 4600-45/2.05	0.80	100	0.40
IRB 6640 (all variants)	0.50	97	1.2