

# Gaging systems



# EQUATOR™

## the versatile gauge™

The Renishaw Equator™ is a versatile alternative to custom gaging, offering inspection of an unprecedented variety of manufactured parts.

### Fast, repeatable and versatile

The Equator™ system consists of a highly repeatable, “parallel kinematic” structure machine coupled with a high-power, multi-axis universal controller and digital servo power amplifier. The resultant system is capable of high-speed, comparative gaging for inspection of high-volume manufactured parts, directly on the shop floor. Additionally, the optimized ratio of working envelope (300 mm × 300 mm × 300 mm\*) to machine footprint (~ 570 mm × 500 mm), means Equator™ can be set to work in even the most crowded of factory spaces. The lightweight machine, weighing just 55 lbs, requires just single phase power and needs no costly air supply.

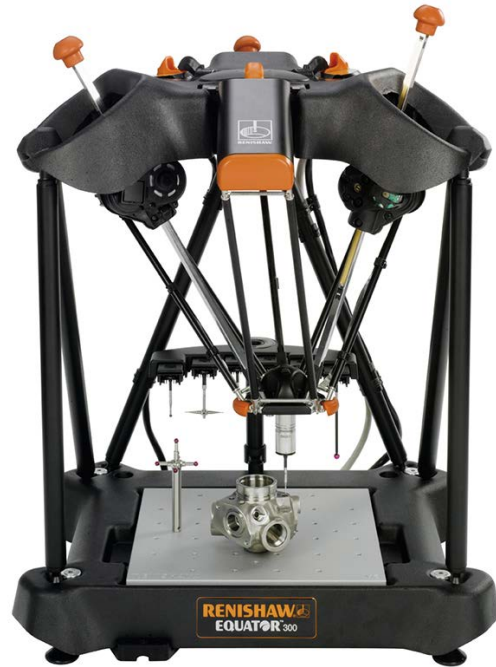
Re-configuration of the gaging system to cater for part design changes, or to measure new parts, is possible in a fraction of the time it would take with conventional custom gaging. An operator can switch between parts in seconds, perfect for flexible manufacturing processes or for accepting parts from multiple machines.

### Easy to use

The included intuitive MODUS™ Organizer operator front-end software requires little or no training, while on the programmable system the comprehensive MODUS™ Equator™ programming software allows engineers to rapidly create gaging routines for any part – simple or complex, prismatic or free-form – using industry-standard DMIS programming.

### Thermally “stable” – for shop floor use

Re-mastering is as swift as measuring a production part and immediately compensates both the machine and the part being measured for temperature variations typical of a shop floor environment.



### Integrated stylus changing

Further versatility is offered by the included Equator™-specific stylus changing rack, allowing automated in-cycle changing of SM25 stylus modules. The SM25 modules couple to the industry-standard SP25 CMM probe, allowing Equator™ users to swap the stylus configurations without re-qualifying each time. Up to six stylus combinations can be loaded into the rack at any time. These can be used on a single complex part or with multiple parts of varying geometries.

### Traceability to calibrated CMMs

Master parts do not need to be expensive custom parts like a traditional gage; take a production part and measure it on a CMM to establish feature variation from CAD or drawing nominals. The results from any CMM can be configured to be used directly within the Equator™ software.

Effectively, the calibrated absolute accuracy of the CMM can be “extended” onto the shop floor to provide calibrated traceability to Equator™ measurements. With the calibration file loaded into the Equator™ software, measurements made in the Equator™ system can be referred back to the CAD or drawing nominals. This allows true process control with SPC packages.

\* 300 mm Z measurement range available with module change to SM25-3, measuring external features only on an extended height Equator only. Z axis stroke is 150 mm.

## Machine kit

Includes: Equator™ 300 machine  
Equator™ 6-port rack  
SP25M scanning probe kit  
Calibration accessory kit  
Joystick (or 'E-stop' button)  
Cables

## Controller kit

Includes: Equator™ controller  
Intuitive "front-end" software package



## Equator™ tiles

Renishaw fixture plates (various options available).

## Regular height Equator™ combination kits

### Operator's version

Description	Part number	Price
Equator™ machine with 6-port rack and joystick, controller with Organizer software and M6 threaded fixture plate	A-EQ33-1J10	\$30,505
Equator™ machine with 6-port rack and joystick, controller with Organizer software and ¼ in R&R threaded fixture plate	A-EQ33-1J40	\$30,882
Equator™ machine with 6-port rack and stop button, controller with Organizer software and M6 threaded fixture plate	A-EQ33-1S10	\$31,581
Equator™ machine with 6-port rack and stop button, controller with Organizer software and ¼ in R&R threaded fixture plate	A-EQ33-1S40	\$30,457

### Programmer's version

Description	Part number	Price
Equator™ machine with 6-port rack and joystick, controller with Organizer and MODUS™ programming software and M6 threaded fixture plate	A-EQ33-2J10	\$34,084
Equator™ machine with 6-port rack and joystick, controller with Organizer and MODUS™ software and ¼ in R&R threaded fixture plate	A-EQ33-2J40	\$34,347

## Extended height Equator™ combination kits

### Operator's version

Description	Part number	Price
Extended height Equator™ machine with 6-port rack and joystick with Organizer software and ¼ in R&R threaded fixture plate	A-EH33-1J40	\$32,268

### Programmer's version

Description	Part number	Price
Extended height Equator™ machine with 6-port rack and joystick with Organizer and MODUS™ software and ¼ in R&R threaded fixture plate	A-EH33-2J40	\$35,733

# New Renishaw Equator™ 500

## Intelligent process control for larger parts with all the benefits of the proven Equator 300 gaging system

The new larger Equator 500 system now enables the gaging of larger parts, with a working volume of 500 mm in diameter and up to 400 mm in height.

Both Equator 300 and 500 gaging systems are accurate between a range of 5 °C and 50 °C at any rate of temperature change, and are capable of scanning speeds in excess of 200 mm/s.

Every system is compatible with simple-to-use Organizer operator software, EZ-IO software for automation, and IPC (intelligent process control) software for updating tool offsets on CNC machine tools.

## Larger measuring volume

The Equator 500 has a gaging volume of 500 mm diameter in the X/Y plane and 250 mm in Z when used with the SM25-2 scanning module. This can be expanded to 400 mm in Z with the SM25-3 scanning module, which allows styli up to 200 mm in length to reach many more features. The base of Equator 500 supports workpiece and fixturing with a total weight limit of 100 kg.

Typical applications include the manufacture of car and truck transmission and engine casings, drive-train parts like conrods and differential housings, suspension castings, pressed parts, valves and pumps.

## Accuracy with rapid temperature changes, now over a 45 °C range

Climatic conditions can result in variable daily and seasonal temperature cycles. For example, early in the morning a cold machine shop can increase in temperature due to both external conditions and machinery heating up. The system has been proven to cope with this by re-mastering, meaning that accurate gaging can start as soon as the first part has been produced and continue regardless of how conditions change.





## Automatic update of tool offsets directly from Equator 300 and 500 systems

The Equator range is compatible with new IPC software which allows constant monitoring and automatic adjustment of a machining operation, keeping part dimensions close to nominal and well within process control limits. This correction of process drift improves part quality and manufacturing capability, and reduces scrap. The proximity of the Equator gage to the CNC process allows adjustment at the point of manufacture, avoiding time delays or reliance on finished part (tailgate) inspection. An Equator gaging system can be connected to one or multiple CNC machine tool controllers.



## Gaging systems

### Replacement equipment

#### Stop button

Part number: A-5504-0255

Price: \$395



#### Joystick kit

Part number: A-5504-0258

Price: \$730



#### Joystick cable only

Part number: A-5358-5016

Price: \$210

#### Button interface

Part number: A-6088-0010

Price: \$875



#### Autochange rack (6 ports)

Part number: A-5504-0250

Price: \$2,435

#### Rack port inserts for 6 off SH25

Part number: A-2237-1414

Price: \$163

#### Rack set-up tool

Part number: A-2237-0682

Price: \$50

#### Rack port clip for autochange rack alignment

6 required.

Part number: M-5358-2589

Price: \$3

#### MODUS™ Equator™ dongle

Part number: A-5639-3000

Price: \$4,200



#### Power cables

Part number: P-EQ33-MAINS

Price: \$16

#### Fixturing plate (M6)

Part number: PCR-13300300-12-6

Price: \$550

#### Fixturing plate (¼-20 in)

Part number: PCR-501212-50-20

Price: \$578

#### Fixturing plate (M4)

Part number: PCR-13300300-10-4

Price: \$620

#### Fixturing plate (M8)

Part number: PCR-13300300-15-8

Price: \$550



**Fixturing plate (single ¼-20 hole)**

**Part number:** R-PEC-13300300-6

**Price:** \$260

**Fixturing plate spacer (50 mm)**

**Part number:** A-5504-0203

**Price:** \$695

**Fixturing plate spacer (150 mm)**

**Part number:** A-5504-0207

**Price:** \$695



## Optional equipment

**Digital I/O box (normally open)**

With Automation software.

**Part number:** A-5923-0050

**Price:** \$5,200

**Additional I/O box only (normally open)**

**Part number:** A-5923-0259

**Price:** \$1,155

**Full 5-sphere calibration artefact only**

**Part number:** A-5504-0252

**Price:** \$440

**Extended calibration artefact stem**

**Part number:** A-5504-0274

**Price:** \$105

**Gage checker**

**Part number:** A-5925-0200

**Price:** \$875

**Cleaning kit**

**Part number:** A-5504-0955

**Price:** \$88

## Equator enclosure

**Equator enclosure kit**

Includes top, base and monitor bracket.

**Part number:** A-5504-0210

**Price:** \$4,340

**Equator enclosure top unit**

**Part number:** A-5504-0211

**Price:** \$2,287

**Equator enclosure base unit**

**Part number:** A-5504-0212

**Price:** \$1,906

**Equator enclosure monitor bracket**

**Part number:** P-PCO1-0045

**Price:** \$154

**MCU docking port for wired joystick**

**Part number:** A-1333-0026

**Price:** \$87



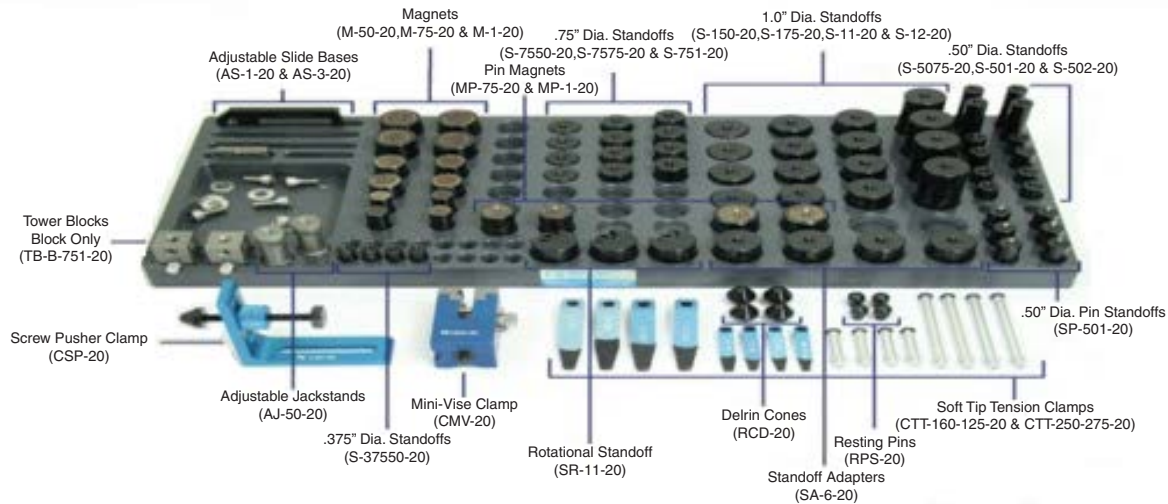
## Gaging systems

### Fixturing components

#### R&R component kit FSC-MCR-20 (1/4-20 in)

Part number: FSC-MCR-20

Price: \$2,615



#### R&R component kit FSC-MCA-20 (1/4-20 in)

Part number: FSC-MCA-20

Price: \$972

#### R&R component kit FSC-CA-20 (1/4-20 in)

Part number: FSC-CA-20

Price: \$744

### Equator probe kit

#### Equator SP25-2 scanning kit with single calibration sphere

Part number: A-5504-0205

Price: \$4,335



### Equator stylus kits

#### Equator basic stylus kit

Part number: A-5504-0281

Price: \$780

#### Equator intermediate stylus kit

Part number: A-5504-0282

Price: \$1,455

#### Equator advanced stylus kit

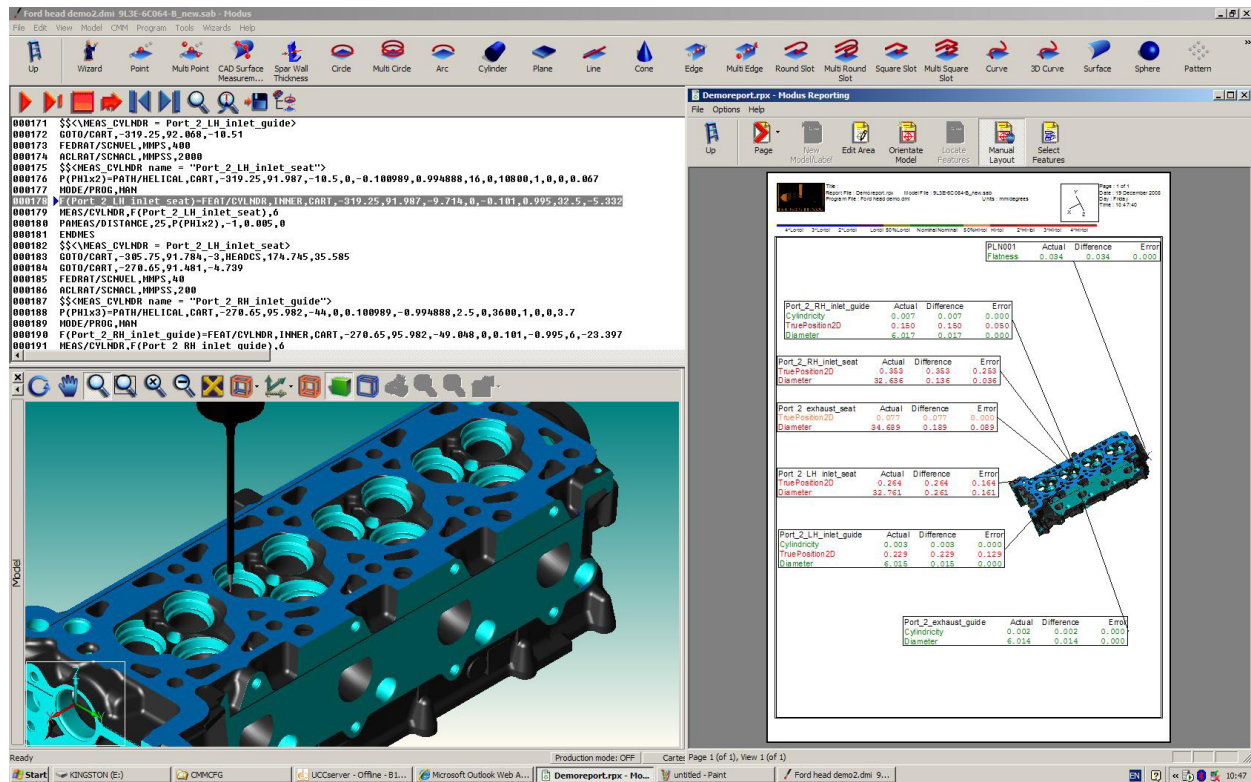
Part number: A-5504-0283

Price: \$2,851





## Equator™ MODUS™ software training



### On site training (maximum 4 students)

#### Description

Equator™ MODUS™ scanning training (US travel) – 4 days

Equator™ MODUS™ advanced training (US travel) – 2 days

#### Part number

CS-TRA-ONSI-11-4DAY

CS-TRA-ONSI-11-2DAY

#### Price

\$9,625

\$5,775

### Training at Renishaw Inc\*

#### Description

Equator™ MODUS™ scanning training (US) – 4 days

Equator™ MODUS™ advanced training (US) – 2 days

#### Part number

CS-TRA-INHO-4DAY

CS-TRA-INHO-2DAY

#### Price

\$3,000

\$1,500

\* per student

### Equator training block

**Part number:** A-5504-0209

**Price:** \$675

### Equator 2nd year extended warranty

Now available.

**Part number:** Please ask your Renishaw representative **Price:** POA

