
DATE: August 23, 2007

ESTIMATE No.

ORDER No.

CUSTOMER

USER



CONTENTS:

XU-RC350D-C03 (M201V) Manipulator Specification
(With Vacuum End-Effector)

| NOTE | COPIES | | ENG. Technology Development Section 2 Semiconductor Robot Plant Semiconductor Robotics Division |
|------|----------|--|---|
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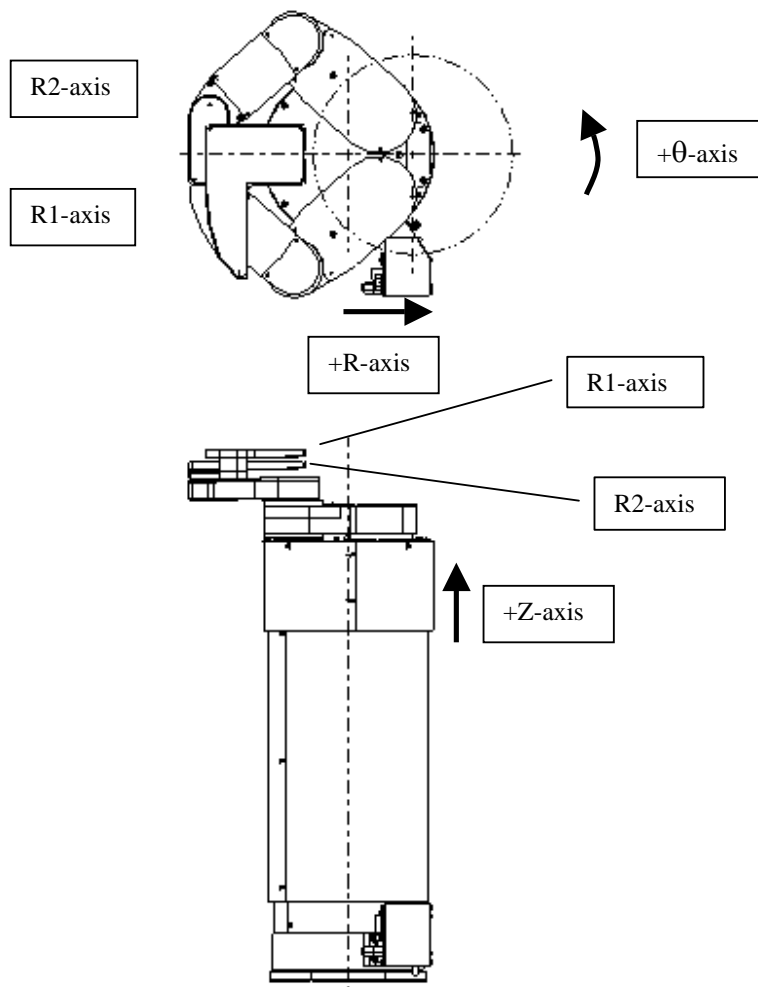
Application

This document describes the specifications of the clean manipulator with Vacuum End-Effector.
Outline drawing: HU0380705.

1. Basic Configuration

The manipulator is capable of: extending arm (R axis), arm rotation (θ axis) and arm elevation (Z axis).

- (1) arm extension
 - extends and retracts the arm
- (2) arm rotation
 - rotates the arm
- (3) arm elevation
 - moves the arm vertically
 - prevents the drop by the Brake in the motor, in power failure.



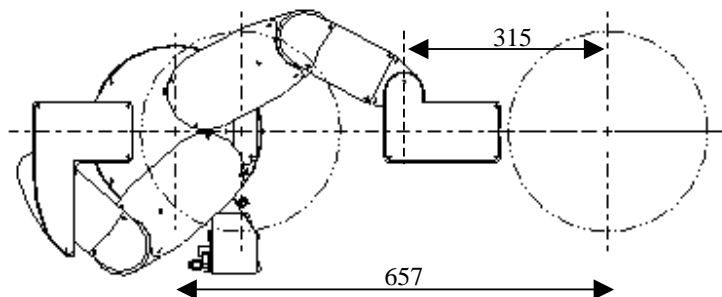
Mechanical Specifications

Basic specifications are shown in the table below.

Basic Specifications

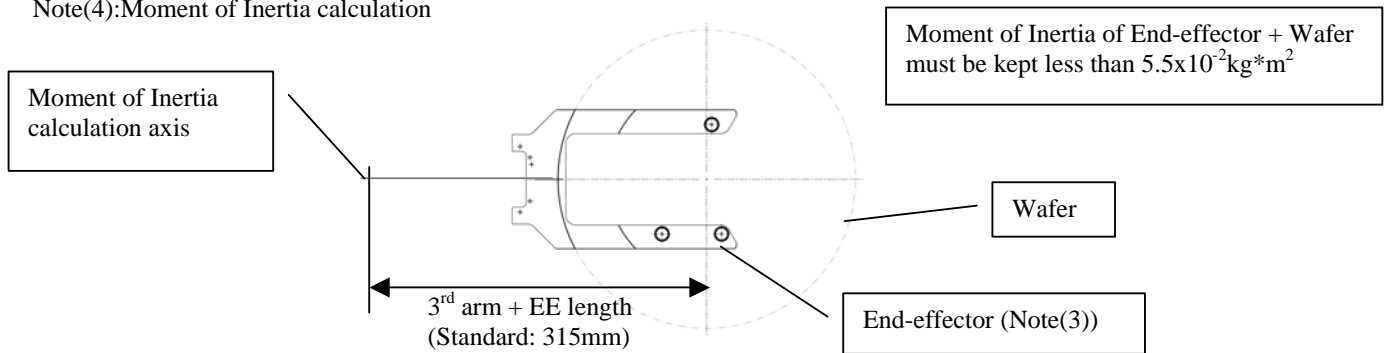
| Item | | Specifications |
|---|--|---|
| Payload (End-effector (Note(3)) + wafer / each wrist) | | 1.0 kg |
| End-effector + Wafer Moment of Inertia (Note(4)) | | $5.5 \times 10^{-2} \text{kg/m}^2$ |
| Range of Motion | R-axis (extension) | 657 mm (reach) ^{Note(1)} |
| | θ -axis (rotation) | 360 deg |
| | Z-axis (elevation) | 380 mm |
| Repeatability (300 times measured) | R-axis (extension) | p-p 0.1mm |
| | θ -axis (rotation) | |
| | Z-axis (elevation) | |
| Maximum Speed (Acceleration /Deceleration time) | R-axis (extension) | 250deg/sec=1467mm/sec (0.18sec) |
| | θ -axis (rotation) | 330deg/sec (0.2sec) |
| | Z-axis (elevation) | 300mm/sec (0.2sec) |
| Minimum rotation diameter | | 510 mm |
| Path Trajectory (side to side) | Individual Axis | $\pm 1.0\text{mm}$ |
| | Relative path between 2 arm | $\pm 0.3\text{mm}$ |
| Wafer Transfer Surface Level (With 300mm Wafer) | Individual Axis | p-p1.0mm |
| | Relative level between 2 arm at full stroke | p-p0.8mm |
| | | |
| Clean Class | | ISO Class 1 ^{Note(2)} with 0.2m/s down-flow |
| Motor Type | | AC200V with 16 bit Absolute Encoder Z-axis: Brake in the motor |
| Vacuum Requirement | | -80 to -70kPa (-11.6 to -10.2PSI), 22L/min |
| Position detection | | Absolute encoder for R, θ and Z axis Backup battery for encoder is built into the manipulator |
| Approximate mass | | Robot: 45 kg |

Note (1): Reach is based on the dimension shown below.



Note (2): Measured in our Clean bench.

Note(4):Moment of Inertia calculation



2. Exterior

Anodized aluminum or Brushed SS.

3. Pneumatically powered Line

The pneumatically powered line is located on the inside of the manipulator.

- ◆ The coupling used to provide air is located at the Manipulator connector panel.
- ◆ For each wafer clamp line a solenoid valve is provided.

4. Operating & Storage Environments

Operating environment

Temperature: 20 ~ 30 °C

Humidity: 35 ~ 55 %RH (non-condensing)

Storage environment

Temperature: 0 ~ 40 °C

Humidity: 20 ~ 80 %RH (non-condensing)

5. Mounting Requirements

See outline drawing.

6. Maintenance

Refer to the Operator Manual and Maintenance Manual

7. Packaging

Collectively packaged and shipped.

8. End-Effector Mapping Sensor

Mapping Sensor is installed on the Manipulator. See Outline drawing.

9. External Cables

Need Encoder Cable and Power Cable.

The pair of Encoder cable and Power cable are registered as a part number shown below.

(Each Encoder and Power cable is also registered separately. See the drawing.)

| | | |
|-----------|-------------|-------------------|
| | Part number | Cable length (mm) |
| Cable set | HU0480512-* | Depends on [*] |

10. Wafer

Be able to transfer 200mm/300mm Wafer. Mapping of Orientation flat wafer is not supported.

11. Warranty

The warranty shall be as follows.

(1) Range of warranty

Manipulator

(2) Terms

One year after delivery of the product to the END USER , or 18 months after the shipment from YASKAWA factory, whichever comes first.

(3) Details

If defects in design, material, or workmanship occur within the term of the warranty, the defective part will be replaced with a similar item or repaired free of charge. In this case, upon request, YASKAWA will send an engineer to your company or the END USER if necessary.

This warranty shall cover YASKAWA products only. It does not apply to secondary damage as a result of the customers or END USER's product failure.

(4) Exceptions

The following cases shall not be covered even if a product is still under warranty.

- If defects occur as a result of not conducting maintenance or inspection as described in the maintenance manual.
- If defects occur as a result of improper repair, modification, transportation or carelessness in handling by your company or the END USER.
- If defects occur as a result of acts of Nature such as a fire, flood, earthquake, lightening, etc.

12. Information

(1) Full stroke operation time

| Axis | Full stroke | Operation time |
|----------|-------------|----------------|
| R | 555mm | 0.94sec |
| θ | 360° | 1.61sec |
| Z | 380mm | 1.78sec |