## List of standard and options

<table>
<thead>
<tr>
<th></th>
<th>NTS10</th>
<th>NTS20</th>
<th>TTS10</th>
<th>TTS20</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Robot arm</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Single arm</td>
<td>✔</td>
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<tr>
<td>Double arm</td>
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<tr>
<td>Z-stroke (470mm)</td>
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<td>✔</td>
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<tr>
<td>Hand specification</td>
<td>✔</td>
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<tr>
<td>Mapping sensor</td>
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<tr>
<td><strong>Arm</strong></td>
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<tr>
<td>Robot arm</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>Edge grip</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>Vacuum</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td><strong>Software</strong></td>
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<tr>
<td>Pattern</td>
<td>✔</td>
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<td>✔</td>
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<td>NREIT</td>
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<td>✔</td>
<td>✔</td>
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<td>NREDS</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td><strong>Manual</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Operation manual</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>Communication command manual</td>
<td>✔</td>
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<td>✔</td>
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<tr>
<td><strong>Training</strong></td>
<td></td>
<td></td>
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<tr>
<td>Programming, maintenance, troubleshooting</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

- **Standard**: ✔
- **Option**: ☑
- **Not Selectable**: ✗

- The standard robot arm does not include a hand.
- Either the edge grip or vacuum hand can be used.
- When selecting a teach pendant, an operation box is also needed.
- Select a robot harness with the length between 1 and 5 meters.

Contact Kawasaki representatives in your region.

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**Kawasaki Robot**

**Clean Robot NTS, TTS series**

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**Kawasaki Heavy Industries, Ltd.**

**Robot Business Division**

Tokyo Head Office/Robot Division
1-14-5, Kaigan, Minato-ku, Tokyo 105-8315, Japan
Phone: +81-3-3435-2501 Fax: +81-3-3437-9880

Akashi Works/Robot Division
1-1, Kawasaki-cho, Akashi, Hyogo 673-8666, Japan
Phone: +81-78-921-2946 Fax: +81-78-923-6548

**Global Network**

Kawasaki Robotics (USA), Inc.
28140 Lakeview Drive, Wixom, MI 48393, U.S.A.
Phone: +1-248-446-4100 Fax: +1-248-446-4200

Kawasaki Robotics (UK) Ltd.
Unit 4, Easter Court, Europa Boulevard, Westbrook Warrington
Chester, WA5 72B, United Kingdom
Phone: +44-1925-71-3000 Fax: +44-1925-71-3001

Kawasaki Robotics GmbH
Im Taubental 32, 41468 Neuss, Germany
Phone: +49-2131-3426-0 Fax: +49-2131-3426-22

Kawasaki Robotics Korea, Ltd.
43, Namdong-daero 215beon-gil, Namdong-gu, Incheon, 21633, Korea
Phone: +82-32-821-6941 Fax: +82-32-821-6947

Kawasaki Robotics (Shanghai) Co., Ltd.
119/10, No19 Xinhu Road, TEDA, China
Phone: +86-22-5983-1888 Fax: +86-22-5983-1889

Kawasaki Robotics (Thailand) Co., Ltd.
Ratchayothin Industrial Estate, Bangkhen, Bangkok 10240
Phone: +66-2-900-098 Telefax: +66-2-900-098

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**Kawasaki Robot Safety**

- **CAUTIONS TO BE TAKEN TO ENSURE SAFETY**
- For those persons involved with the operation / service of your system, including Kawasaki Robot, they must strictly observe all safety regulations at all times. They should carefully read the Manuals and other related safety documents.
- Products described in this catalogue are general industrial robots. Therefore, if a customer wishes to use the Robot for special purposes, which might endanger operators or if the Robot has any problems, please contact us. We will be pleased to help you.
- Be careful as Photographs illustrated in this catalogue are frequently taken after removing safety fences and other safety devices stipulated in the safety regulations from the Robot operation system.

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https://robotics.kawasaki.com/
Horizontal Articulated Arm

NTS series

Features:
- A single robot can access 2 and 3 FOUPs of EFEM without a track.
- Smooth operation. The specially designed drive system enables the robot to move incredibly smoothly and deliver high precision.
- Compliant with SEMI-F47 standard.
- Compliant with SEMI-S2 standard. Sufficient considerations given to the environment and personal safety.

Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>NTS10</th>
<th>NTS20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure</td>
<td>Horizontal articulated type</td>
<td>Horizontal articulated type</td>
</tr>
<tr>
<td>Degree of freedom (axes)</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>θ1 axis (rotation JT2) (°)</td>
<td>340</td>
<td>340</td>
</tr>
<tr>
<td>Z axis (up-down JT3) (mm)</td>
<td>470</td>
<td>470</td>
</tr>
<tr>
<td>θ2 axis (rotation JT4) (°)</td>
<td>340</td>
<td>340</td>
</tr>
<tr>
<td>H1 axis (rotation JT6) (°)</td>
<td>340</td>
<td>340</td>
</tr>
<tr>
<td>H2 axis (rotation JT7) (°)</td>
<td>340</td>
<td>340</td>
</tr>
<tr>
<td>Maximum reach (mm)</td>
<td>1,066</td>
<td>1,066</td>
</tr>
<tr>
<td>Repeatability (mm)</td>
<td>±0.1 (Wafer Center)</td>
<td>±0.1 (Wafer Center)</td>
</tr>
<tr>
<td>Cleanliness*1</td>
<td>ISO Class 1</td>
<td>ISO Class 1</td>
</tr>
</tbody>
</table>

*1: Measured in our clean booth

Layout Example

The NTS and TTS series can be used for 2 to 3 FOUPs of EFEM without a track. (The same arm can be used for 2 FOUPs and 3 FOUPs).

Features:
- A single robot can access 2 and 3 FOUPs of EFEM without a track.
- Smooth operation. The specially designed drive system enables the robot to move incredibly smoothly and deliver high precision.
- Compliant with SEMI-F47 standard.
- Compliant with SEMI-S2 standard. Sufficient considerations given to the environment and personal safety.

TTS series

Features:
- All the features of the NTS series have been carried over to the TTS series, including the ability to access up to 3 FOUPs.
- Kawasaki's unique and highly rigid telescopic mechanism delivers high-speed handling in high and low positions.
- Compliant with SEMI-F47 standard.
- Compliant with SEMI-S2 standard. Sufficient consideration given to the environment and personal safety.

Specifications

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<tr>
<th>Model</th>
<th>TTS10</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Structure</td>
<td>Telescopic horizontal articulated type</td>
<td>Telescopic horizontal articulated type</td>
</tr>
<tr>
<td>Degree of freedom (axes)</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>θ1 axis (rotation JT2) (°)</td>
<td>340</td>
<td>340</td>
</tr>
<tr>
<td>Z axis (up-down JT3) (mm)</td>
<td>740</td>
<td>740</td>
</tr>
<tr>
<td>θ2 axis (rotation JT4) (°)</td>
<td>340</td>
<td>340</td>
</tr>
<tr>
<td>H1 axis (rotation JT6) (°)</td>
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</tr>
<tr>
<td>H2 axis (rotation JT7) (°)</td>
<td>340</td>
<td>340</td>
</tr>
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<td>Maximum reach (mm)</td>
<td>1,066</td>
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</tr>
<tr>
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<td>ISO Class 1</td>
<td>ISO Class 1</td>
</tr>
</tbody>
</table>

*1: Measured in our clean booth

Software

Standard software

The standard software best suits robot operations for wafer handling and allows monitoring of operating conditions.

KMTerm
By connecting with the robot controller, the KMTerm allows parameter setting, information display and data backup.

KSUtility Lite
The KSUtility Lite enables the robot to be operated from the host PC.

Optional Software

Optional software allows the user to perform layout studies and simulation for tact time on their own PC.

KRET
Designing of layout inside the equipment and operational paths can be done with ease.

KSUtility
Enables the robot to be operated from the host PC.

CR3D
Robot operations can be performed off line with ease.

Features:
- High-speed alignment (time for alignment per se is 2.5 seconds only).

Hand (Option)

Features:
- Compact package. Compliant with SEMI-F47 standard.
- Ethernet communication port installed as standard.

Features:
- For details of the software, see relevant manuals.

Aligner (Option)

Features:
- High-speed alignment (time for alignment per se is 2.5 seconds only).

Controller

Features:
- Compact package. Compliant with SEMI-F47 standard.
- Ethernet communication port installed as standard.

Features:
- For details of the software, see relevant manuals.

For detail specifications, contact Kawasaki representatives in your region.