TS2 robot range

Robotics | Experts in Man and Machine
“Today, our robots work both for, and with, people. They have to be fast and precise, collaborative and agile, user-friendly and highly mobile. In all kinds of industries, they redefine performance. Even in the most sensitive environments, they make production smarter. Providing smart data, in an easily connected world, where we share our expertise. A world of solutions.”

People drive change, robots accelerate the pace.

Gerald Vogt, Group Division Manager | Robotics

Stäubli is entering a new performance class with its TS2 SCARA series. The completely redesigned 4-axis machine with proprietary JCS drive technology facilitates ultra-short cycle times and high repeatability. It also has a revolutionary encapsulated design which opens up new possibilities for use in sensitive environments. The new TS2 SCARA series share the same structural segments as the 6-axis TX2 robots, offering an identical footprint for high modularity and optimized development times, as well as the same CS9 controller.

TS2 robots and CS9 controller main benefits

STÄUBLI VISION

Experts in Man and Machine

TS2 SCARA RANGE

Design, performance and connectivity redefined
**CONCEPTION**

**Smart design**

- TS2 Robotic arm
  - Encapsulated 4-axis arm enabled by hollow shaft drives, no external cables
  - IP65 for the entire arm with optional ball screw cover and bellows
  - Versions available even for sensitive environments, from harsh and dirty to sterile
  - Protection and additional installation options available
  - Elegant and innovative design
  - Custom colors possible for your CI requirements
  - Easy service access to components
  - No cable friction with cell walls or other peripherals for increased reliability and lifetime of the cabling
  - No screws from the top in whole working envelope
  - The design allows to mount different peripherals rigidly on the robot, for example cameras

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**INTEGRATION**

**Integration flexibility, modular and scalable**

- TS2 Robotic arm
  - Unique cylindrical envelope and small footprint
  - Axis 1 working range: ± 180°
  - High dexterity in small workspaces due to compact integration of motors
  - Floor and ceiling mounting for flexible and scalable integration, wall mounting possible via mechanical interface (3D drawings supplied upon request)
  - Integrated electrical and pneumatic user circuit including Cat5e available until robot flange
  - Different pneumatics valve types are available
  - Sealed vertical cable option bringing additional and smart integration options

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- CS9 controller
  - Standard 19 inch rack mount
  - Light and compact size
  - All user connections on the front
  - Generic rackable design for simple systems integration
  - Status display available on front panel
  - Easy drawers access due to smart design
  - Integrated web server technology

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- SP2 control pendant
  - Web technology based
  - Light, compact and robust
  - Portrait or landscape mode
  - Fits right or left handed
  - Touch screen color display

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- Tool changer
  - Ultra-compact integrated tool changer available (optional), allows automatic - manual connection / disconnection of various tools
  - Allows instant production changeovers
  - Brings time savings, increased flexibility to ensure a rapid return on investment
  - Includes pneumatic, power and signal (Cat5e) contacts

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- Integrated electrical and pneumatic user circuit including Cat5e available until robot flange
- Different pneumatics valve types are available
- Sealed vertical cable option bringing additional and smart integration options
**High performance kinematics**

- Over 125 years of experience in fast moving technology
- Light and rigid structure
- Modular: same components as TX2 6-axis robots
- Patented JCS smart gearbox on axis 1 and 2 designed for compact robots:
  - high dynamics, agility and path precision also due to higher drive frequency
  - encapsulated in oil bath, perfect lubrication allows extremely high dynamics
- Unique, 19-bit safe digital multi-turn absolute encoders, ready to operate with no initiation
- Outstanding precision for robot guided by camera and path precision
- Dynamic absolute calibration as a standard option for all Stäubli robots

**Even in the sensitive environments**

ESD robots are designed to prevent electrostatic discharges in order to safely handle electronic components. It can operate in sensitive electronic environment for various applications such as PCB assembly, vision inspection, product testing and packaging of electronic consumer goods.

- ESD compliance guaranteed by 3 specific tests: surface resistivity, residual charges, dissipation and transversal conductivity and 10 test points covering every arm’s element
- Minimize part failures and rework costs: ensure that all accessible elements are dissipative to eliminate ESD risks in production. Specific ESD compliant paint
- Safely handle sensitive devices: each arm link connected to ground, transversal conductivity

TS2 HE robots are made for use in humid environments, for example in food or metal industries. They feature unique advantages:

- Hygienic encapsulated design
- Integrated electrical and pneumatic user circuits including Cat5e
- Pressurized arm
- Sealed vertical cable option brings additional and smart integration options
- Smooth rounded surface and sealed screws with hexagonal heads providing minimum retention areas
- Easy cleaning
- Resistant to pH from 4.8 to 8.5 (from 2 to 12 under conditions)
- Ability to run with NSF H1 Food oil with no loss of performance
Fully connected to the production world

Connectivity to the smart production
- Compatibility to all production devices and ERP
- All standardized communication protocols, including real time Ethernet, available and configurable via a unique software suite
- Web server embedded in CS9 controller
- Smart data for digital production and cockpit
- Any system data accessible and linkable to all interfaces, including OPC UA

Connectivity to gripper and parts to be manufactured
- Integrated tool changer available (optional) allows automatic - manual connection / disconnection of various tools
- Encapsulated Ethernet Cat5e for multi-gripper, camera and sensors
- Electrical and pneumatic connections running inside the arm for added protection, available on the forearm close to the gripper
- Different types of valves:
  - 5/2 and 5/3 for air pressure
  - 3/2 for vacuum or pressure
- Direct tubing for additional valves or devices available
**Main characteristics**

<table>
<thead>
<tr>
<th>MODEL</th>
<th>TS2-40</th>
<th>TS2-60</th>
<th>TS2-80</th>
<th>TS2-100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum payload</td>
<td>8.4 kg</td>
<td>4.8 kg</td>
<td>2.4 kg</td>
<td>1.4 kg</td>
</tr>
<tr>
<td>Nominal payload</td>
<td>2.4 kg</td>
<td>1.2 kg</td>
<td>0.6 kg</td>
<td>0.3 kg</td>
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<tr>
<td>Reach (between axis 1 and 4)</td>
<td>460 mm</td>
<td>620 mm</td>
<td>800 mm</td>
<td>1000 mm</td>
</tr>
<tr>
<td>Number of degrees of freedom</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Stroke</td>
<td>200 mm or 400 mm (option)</td>
<td>200 mm or 400 mm (option)</td>
<td>200 mm or 400 mm (option)</td>
<td>200 mm or 400 mm (option)</td>
</tr>
<tr>
<td>Repeatability X - Y</td>
<td>± 0.01 mm</td>
<td>± 0.015 mm</td>
<td>± 0.02 mm</td>
<td>± 0.1 mm</td>
</tr>
<tr>
<td>Repeatability Z</td>
<td>± 0.004 mm</td>
<td>± 0.005 mm</td>
<td>± 0.006 mm</td>
<td>± 0.007 mm</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP34 standard</td>
<td>IP54 with ball screw cover</td>
<td>IP65 with ball screw cover and bellows</td>
<td></td>
</tr>
<tr>
<td>Cycles per minute*</td>
<td>240 (0.25s)</td>
<td>220 (0.27s)</td>
<td>200 (0.30s)</td>
<td>170 (0.35s)</td>
</tr>
<tr>
<td>Weight</td>
<td>38 kg</td>
<td>39 kg</td>
<td>40 kg</td>
<td>41 kg</td>
</tr>
</tbody>
</table>

*Optional for CS9 model:
- PCIe cards: ASI Master, CCLink Master, Profinet DP Master & Slave, Ethernet IP Adapter & Scanner, EtherCAT Master & Slave, PowerLink Controlled Node
- Industrial chassis with air-air heat exchanger
- OPC UA server

**CS9 controller energy efficiency**
- Energy recuperation during each joint deceleration
- Different power saving/sleep modes bring up to 40% consumption savings
- Most energy efficient robot system based on VDMA norm 24608
- High lifetime and low maintenance, all subcomponents easily accessible and exchangeable

**CS9 controller maintenance**
- Minimal maintenance
- Universal power supply for all voltages
- Easy drawer access due to smart design

**CS9 controller - (H x W x D) 270 x 445 x 365 mm - 38 kg**
- IP20
- 1 GB RAM
- USB ports
- 2 GE CFAST
- Serial link RS232, 2 Ethernet ports (Socket, FTP Server/Client)
- EtherCAT Master
- Modbus TCP/IP Slave / Client, Sercos III Slave, Ethernet IP Adapter, Profinet IO Device, EtherCAT Slave, PowerLink Controlled Node, FSOE Slave

**SP2 manual control unit: the power at your fingertips**
This unique terminal combines a lightweight design, ergonomics (for left or right-handed users) and robustness to deliver advantages in all environments:
- built-in programming, maintenance and supervision,
- safety functions (3-position dead-man control, emergency stop),
- ease of use, graphics and intuitive interface,
- integrated Web technology.
Global presence of the Stäubli Group

www.staubli.com