

Torch Service Center 2013

Makes your robot welding more effective and accurate



The worst load in a robot welding cell has the welding torch. It is exposed for heat, welding spatter and in worst case, collisions. Welding torches are made for such environment but need regularly cleaning, measuring and TCP-definition in order to weld with good quality and accuracy. It consists of three main units – a mechanical torch cleaner, a tool center point definer and a wire cutter.

Spatter – a production problem

It is impossible to avoid spatter during welding operations. Hot particles from the arc easily adhere into the gas nozzle. The problem is familiar to all welders – a gradual build up of spatter in the nozzle leading to blocked wire feed and absence of shielding gas or short circuiting make the torch useless.

Even relatively small amounts of spatter in the gas nozzle affects the operation, giving poor starting and low quality weld as a result. But what is a nuisance to welders becomes a potentially serious problem to welding robots.

The Torch Service Center is an integrated system for mechanically removing spatter from welding torches. The robot control system operates and supervises the cleaning operation to make sure that it will not start until the torch is clamped in the correct position.

Robot welding stations are today a common and well known tool in the industry. The continuous development of robots, welding equipment and work piece positioners has dramatically decreased the cycle time and increased the uptime.

This ensures that no vibration or shocks reach the robot and the torch is locked in the same position every time for more precise cleaning and less wear on the parts cleaned. The entire cleaning operation is automatic in one sequence, including mechanically cleaning, pneumatic cleaning and finally release agent injection into the gas nozzle.

Accurate Tool Center Point – absolute necessary at any robot operations

The Tool Center Point, called TCP, is the robot-motions center point. In arc welding applications means a correct defined TCP that all robot motions starts from the wire stick-out at the contact tip. Consequently a bad defined TCP makes the robot not to follow the programmed path. Creating an accurate TCP is time demanding and the accuracy is depending on how careful the person doing the job is. Regular TCP confirmation is necessary because there are a number of things that can cause the welding torch to be out-of-position:

- A collision with the work piece, e.g. the robot hitting a fixture clamp which was left in the wrong position
- In-correct defined TCP
- After exchange of the welding torch
- After exchange of the swan neck

The TSC 2013 provides completely automated Tool Center Point definition. While setting up the robot station the TSC 2013 automatically define the tool center point. During production running the robot can be programmed to go to the TSC 2013 at regular intervals, check the tool center point, automatically make any necessary adjustments and go back to work with accurately defined tool center point. The wire cutter ensures exact and consistent wire stick out length and makes it possible for the TSC 2013 to define the tool center point to the end of the wire and to the center of its diameter.

Real customer feedback information tells us that after introducing our automatic Tool Center Point feature on exiting robot stations have gained the following benefits:

- Better up-time in the robot station, giving more production hours
- Improved welding quality, resulting in reduced repair cost to almost zero
- As they now can trust the TCP in their robot system, they faster locate other tolerance problems in their own part production.

Torch Service Center 2013 – design

The mechanical torch cleaning system has a modular design and consists of:

- Torch cleaner unit TC 2013 (gas nozzle cleaning)
- Tool Center Point gauging and calibrating system
- Wire cutter
- Release agent injection

Technical information

Physical

Weight	30 kg
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TC 2013

Control voltage	24 V DC
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Compressed Air	1/8 inch. Min. 6 bar
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Control System	IRC5 with RobotWare 5.15.05 and later
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Wire cutter

Max. wire diameter to be cut	1,2 mm steel and aluminum
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