KUKA FSW application module
_the module for joining non-ferrous metals

KUKA Friction Stir Welding (FSW) application modules offer system integrators and end customers maximum flexibility for joining non-ferrous metals with a low melting temperature and for mixed-material combinations such as aluminum and steel. Ideal for demanding material combinations for future-oriented markets, such as electromobility. For efficiency in top quality.

**Highlights**
FSW application module

- Use of heavy-duty robots with process-specific additions and expansions in software and hardware
- Joining of 1D, 2D and complex 3D seams
- Suitable for the cost-effective joining of non-ferrous metals (aluminum up to 8 mm)
- Precise path accuracy of up to 0.5 mm achievable thanks to KUKA path calibration
- Large workspace, can be expanded by means of linear axes
- Low investment costs
KUKA FSW application module
_extremely flexible friction stir welding application for joining non-ferrous metals

Various option packages can be selected, depending on the specific requirements on the friction stir welding applications:

- PCD 507 and HMI Advanced:
  - 100% process monitoring and documentation with display on the new HMI Advanced
- 6D sensor
  - Additional process data by measuring the process forces and torques in three directions
- KR C4 extended Controller
  - Compact control cabinet for connection of additional positioner and linear axes
- Tooling kit «Rotating Shoulder» (pin and shoulder)
  - Tool with adjustable welding pin length for different workpiece thicknesses
- Tooling kit «Stationary Shoulder» (pin and shoulder)
  - Tool with stationary shoulder and rotating pin (lower heat input, reduced burring)
- KUKA Connectivity Box
  - Remote access to KUKA Remote Service and for data exchange with cloud systems
- Safety PLC
  - For setting up simple cells with Emergency Stop and door interlock (R&D cells)
- Customer-specific designs on request

Target applications
- Battery housings for EV and HEV
- Housings for power electronics and heat exchangers
- Cooling systems for power electronics
- Casings for smartphones, tablets and operator panels

Features
- Integrated FSW spindle for force-controlled FSW process
- Improved ease of operation with HMI on KUKA smartPAD and HMI Advanced
- 100% process monitoring with KUKA PCD 507

Basic components of the FSW application module
- Energy supply for FSW 3 spindle
- KR 500 R2830 FORTEC MT robot
- FSW 3 spindle
- KR C4 Controller
- KUKA smartPAD
- FSW technology cabinet with hydraulic and pneumatic components
- Spindle cooling

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