



Welding Station

The automatic welding station consists of two welding robots traveling around the pipe on a guiding band, with each robot welding 180° of the pipe. Each welding robot independently controls the wire feeder unit and welding power source, which adjusts according to welding parameters as the welding position changes.

In addition to orbital travel around the pipe, the welding robot provides three-axis movement, controlling the welding working distance, oscillation and angle of the welding head. The Automatic Welding System has the ability to perform any welding pass on any welding station and multiple passes in one station, increasing flexibility and ease of use in comparison to other available systems.

Software Application

The proprietary software application for the welding robot (WPedit™) allows for development of welding procedures and parameters. WPedit™ is a user-friendly application applying a graphical user interface. It allows fast development of welding procedures and reduced set-up time. Some of the components include:

- Weld client database — keeps records of clients and allows easy management of clients' data.
- Pipe bevel design program — allows the easy design of a compound bevel, prepared by the pipe-facing machine.
- Welding procedure specification design tool — allows for quick development of welding procedure documentation.
- Weld pass manager — allows easy management of weld passes with the possibility of importing and/or exporting pass parameters.
- Weld pass editor — allows easy editing of position dependent and independent welding parameters.

The system monitors its position from 0°-359°, allowing for constant adjustment to the set welding parameters. The system eliminates the need for manual adjust-

ment of the welding parameters. The position-dependent parameters include:

- Arc voltage,
- Arc current,
- Wire feed speed,
- Orbital travel speed,
- Oscillation speed,
- Oscillation width,
- Oscillation dwell time,
- Welding Head angle,
- Inductance setting,
- Pulse current and frequency, and
- Pulse width.

The welding system incorporates the following control features:

- Proprietary automatic weld "center line follower" with proprietary "digital" controls built into the main controller of the welding robot, eliminating the need for additional devices.
- Proprietary automatic weld "work-distance control", controlling work distance using a welding arc measurement built into the main controller of the welding robot, eliminating the need for additional devices.
- Proprietary "absolute position measurement" on the pipe using a "smart-digital" inclination sensor, which provides high accuracy of welding position on the pipe.
- Proprietary automatic "in position parameter setting" and "on-the-fly setting" of position-dependent parameters allows real-time changing

of welding parameters required by changing welding positions from 0°-359° around the pipe.

- Proprietary automatic mode allows automatic start and stop of the welding process depending on the pre-defined set positions, reducing the need for operator assistance.
- Proprietary automatic recovery algorithm allows for automatic recovery of automatic mode in fault condition, eliminating the need for manual restart of the welding process.
- Proprietary software algorithm allows two welding robots at each welding station, welding 180° of pipe, to intercommunicate and synchronize the welding process without operator assistance.
- eWELD™: proprietary electronic real-time data acquisition and historical lookup with the option of global and wireless networking.

Dual-Head Welding

The automatic welding system is also available in a dual-head version. The dual-head welding robot is designed to increase welding production rates by welding two passes in one run. Each dual-head welding robot controls two wire feeder units and two welding power sources. The dual-head welding robot independently controls oscillation movement and welding work distance. Welding parameters are programmed independently on each welding head while orbital travel speeds stay in common.

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