

AWS D16.2M/D16.2:2007
An American National Standard



Guide for Components of Robotic and Automatic Arc Welding Installations



American Welding Society



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An American National Standard**

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Guide for Components of Robotic and Automatic Arc Welding Installations

3rd Edition

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Prepared by the
American Welding Society (AWS) D16 Committee on Robotic and Automatic Welding

Under the Direction of the
AWS Technical Activities Committee

Approved by the
AWS Board of Directors

Abstract

AWS D16.2M/D16.2:2007, *Guide for Components of Robotic and Automatic Arc Welding Installations*, provides performance recommendations for evaluating components of a typical robotic or automatic welding installation.

Emphasis is placed on the role of the welding interface. A pin arrangement and specific pin function for each location in a standardized 37-pin connector are proposed.



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Guide for Components of Robotic and Automatic Arc Welding Installations

1. Scope

This document applies to the recommended design, integration, installation, and use of industrial welding robotic and automatic systems. This document is intended for the gas metal arc welding (GMAW) and flux cored arc welding (FCAW) processes. Pertinent parts may address additional welding processes.

Robotic and automatic arc welding systems consist of a manipulator, power source, arc welding torch and accessories, electrode feed system, dereeling system, shielding gas delivery system, welding circuit, shielding and communication control, and grounding system. There may be other accessories that are outside the scope of this document, such as safety devices and monitoring, joint-tracking, and vision systems. A typical system is illustrated in Figure 1.

This standard makes use of both the International System of Units (SI) and U.S. Customary Units. The measurements may not be exact equivalents; therefore, each system must be used independently of the other without combining in any way. The standard with the designation D16.2M:2006 uses SI Units. The standard designation D16.2:2006 uses U.S. Customary Units. The latter are shown within brackets [] or in appropriate columns in tables and figures.

Safety and health issues and concerns are beyond the scope of this standard and therefore are not fully addressed herein. Safety and health information is available from other sources, including, but not limited to, ANSI Z49.1, Safety in Welding, Cutting, and Allied Processes, and applicable federal and state regulations. Other safety documents are listed in Annex B.

2. Normative References

The following standard contains provisions which, through reference in this text, constitute provisions of this AWS standard. For undated references, the latest edition of the referenced standard shall apply. For dated

references, subsequent amendments to, or revisions of, any of these publications do not apply.

AWS Documents:¹

AWS A3.0, *Standard Welding Terms and Definitions*

3. Definitions

Terms used in this document are in accordance with AWS A3.0, Standard Welding Terms and Definitions. In addition, for the purposes of this document, the following definitions apply:

analog input. A dc voltage signal from the process equipment to the robot controller that may vary from 0 to 100% of the output range.

analog output. A dc voltage signal from the robot controller to the process equipment that may vary from 0 to 100% of the output range.

arc established. A discrete input signal indicating that a welding arc is present.

arc on/arc off. A discrete output signal that initiates or terminates the welding process.

continuous duty. The capability of a power source to operate 100% of the time without interruption and without exceeding the maximum temperature criteria of the insulation and components within the power source. In all cases, the required load should not exceed the weld power source rating for continuous duty.

discrete input. An on-off signal from the weld equipment to the robot controller to indicate the status of the function being monitored.

discrete output. An on-off command from the robot controller to the weld equipment used to control peripheral components.

¹AWS standards are published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.