ISA-5.1-1984 (R1992)

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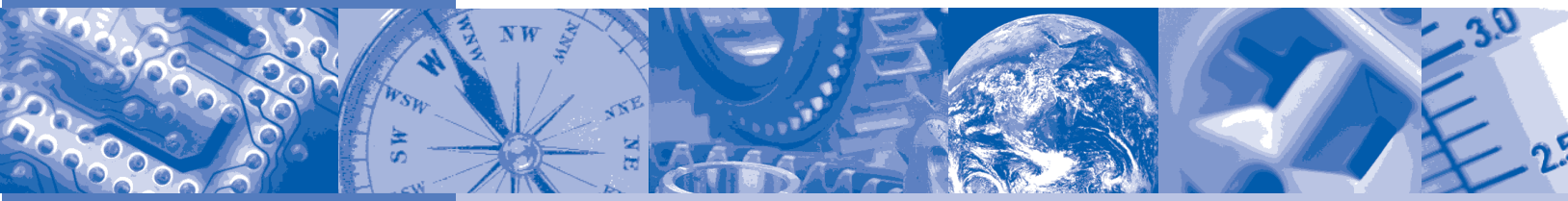

Instrumentation Symbols and Identification

Reaffirmed 13 July 1992

ISA–The Instrumentation, Systems, and Automation Society

ISA-5.1-1984 (R1992), Instrumentation Symbols and Identification

ISBN 0-87664-844-8

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Preface

This preface is included for information and is not a part of ISA-5.1-1984 (R1992).

This standard has been prepared as part of the service of ISA toward a goal of uniformity in the field of instrumentation. To be of real value, this document should not be static, but should be subject to periodic review. Toward this end, the Society welcomes all comments and criticisms, and asks that they be addressed to the Secretary, Standards and Practices Board, ISA, 67 Alexander Drive, P.O. Box 12277, Research Triangle Park, NC 27709, Telephone (919) 549-8411, e-mail: standards@isa.org.

The ISA Standards and Practices Department is aware of the growing need for attention to the metric system of units in general, and the International System of Units (SI) in particular, in the preparation of instrumentation standards. The Department is further aware of the benefits to U.S.A. users of ISA standards of incorporating suitable references to the SI (and the metric system) in their business and professional dealings with other countries. Toward this end, this Department will endeavor to introduce SI-acceptable metric units in all new and revised standards to the greatest extent possible. *The Metric Practice Guide*, which has been published by the Institute of Electrical and Electronics Engineers as ANSI/IEEE Std. 268-1982, and future revisions will be the reference guide for definitions, symbols, abbreviations, and conversion factors.

It is the policy of ISA to encourage and welcome the participation of all concerned individuals and interests in the development of ISA standards. Participation in the ISA standards-making process by an individual in no way constitutes endorsement by the employer of that individual, of ISA, or of any of the standards that ISA develops.

The information contained in the preface, footnotes, and appendices is included for information only and is not a part of the standard.

The instrumentation symbolism and identification techniques described in the standard accommodate the advances in technology and reflect the collective industrial experience gained since the publication of Recommended Practice RP5.1 in 1949.

This revision attempts to strengthen the standard in its role as a tool of communication in the process industries. Communication presupposes a common language; or, at the very least, it is facilitated by one. The standard offers the foundation for that common language.

When integrated into a system, the symbols and designations presented here form a concise, dedicated language which communicates concepts, facts, intent, instructions, and knowledge about measurement and control systems in the process industries.

This document is a consensus standard rather than a mandatory one. As such, it has many of the strengths and the weaknesses of consensus standards. Its primary strength is that it can be used in widespread, interdisciplinary ways. Its weakness is generally that of not being specific enough to satisfy the special requirements of particular interest groups.

The symbols and identification contained in ISA-5.1 have evolved by the consensus method and are intended for wide application throughout the process industries. The symbols and designations are used as conceptualizing aids, as design tools, as teaching devices, and as a concise and specific means of communication on all types and kinds of technical, engineering, procurement, construction, and maintenance documents.

In the past, the standard has been flexible enough to serve all of the uses just described. In the future, it must continue to do so. To this end, this revision offers symbols, identification, and definitions for concepts that were not previously described; for example, shared display/control, distributed control, and programmable control. Definitions were broadened to accommodate the fact that, although similar functions are being performed by the new control systems, these functions are frequently not related to a uniquely identifiable instrument; yet they still must be conceptualized and identified. The excellent SAMA (Scientific Apparatus Makers Association) method of functional diagramming was used to describe function blocks and function designators. To help the batch processing industries, where binary (on-off) symbolism is extremely useful, new binary line symbols were introduced and first-letter *Y* was selected to represent an initiating variable which could be categorized as an event, presence, or state. In general, breadth of application as opposed to narrowness has been emphasized.

The ISA Standards Committee on Instrumentation Symbols and Identification operates within the ISA Standards and Practices Department, with William Calder III as vice president. The persons listed below served as members of or advisors to the SP5.1 committee. The SP5.1 committee is deeply appreciative of the work of previous SP5.1 committees and has tried to treat their work with the respect it deserves. In addition, this committee would like to acknowledge the work of the SP5.3 committee in developing ISA-5.3, "Graphic Symbols for Distributed Control/Shared Display Instrumentation, Logic and Computer Systems." The key elements of ISA-5.3 have been incorporated into ISA-5.1, and it is the Society's intent to withdraw ISA-5.3 after publication of this revision of ISA-5.1.

The following people served as members of ISA Committee SP5.1, which prepared this standard:

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This standard was approved for publication by the ISA Standards and Practices Board in September 1984.

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Contents

1 Purpose

The purpose of this standard is to establish a uniform means of designating instruments and instrumentation systems used for measurement and control. To this end, a designation system that includes symbols and an identification code is presented.

2 Scope

2.1 General

2.1.1 The procedural needs of various users are different. The standard recognizes these needs, when they are consistent with the objectives of the standard, by providing alternative symbolism methods. A number of examples are provided for adding information or simplifying the symbolism, as desired.

2.1.2 Process equipment symbols are not part of this standard, but are included only to illustrate applications of instrumentation symbols.

2.2 Application to industries

2.2.1 The standard is suitable for use in the chemical, petroleum, power generation, air conditioning, metal refining, and numerous other, process industries.

2.2.2 Certain fields, such as astronomy, navigation, and medicine, use very specialized instruments that are different from the conventional industrial process instruments. No specific effort was made to have the standard meet the requirements of those fields. However, it is expected that the standard will be flexible enough to meet many of the needs of special fields.

2.3 Application to work activities

2.3.1 The standard is suitable for use whenever any reference to an instrument or to a control system function is required for the purposes of symbolization and identification. Such references may be required for the following uses, as well as others:

- Design sketches
- Teaching examples
- Technical papers, literature, and discussions
- Instrumentation system diagrams, loop diagrams, logic diagrams
- Functional descriptions
- Flow diagrams: Process, Mechanical, Engineering, Systems, Piping (Process) and Instrumentation
- Construction drawings
- Specifications, purchase orders, manifests, and other lists