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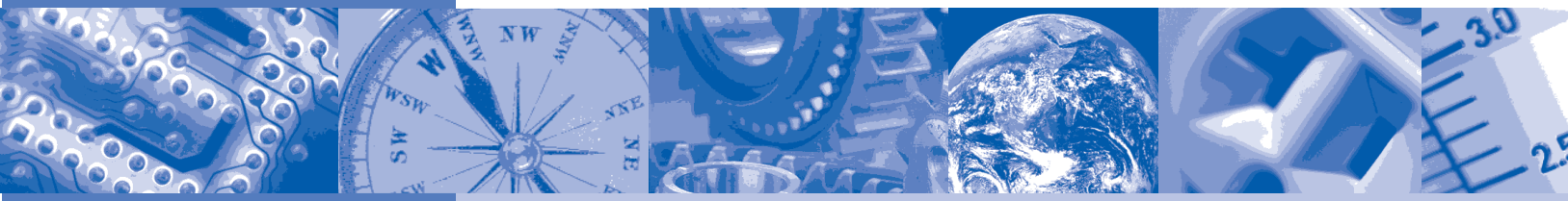

Instrument Loop Diagrams

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ISA–The Instrumentation, Systems, and Automation Society

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Preface

The information contained in the Preface and Forward is for information only and is not a part of the standard.

This standard is 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 must be subject to periodic review. Toward this end, the Society welcomes all comments and criticisms, and request 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 try to introduce SI-acceptable metric units in all new and revised standards to the greatest extent possible. *The Metric Practice Guide*, 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.

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Foreword

Instrument loop diagrams are suitable for general use throughout industry. It is important to consider their value for design, construction, checkout, start-up, operation, maintenance, rearrangement, and reconstruction. Benefits can include reduction in engineering costs, improved loop integrity and purchasing accuracy, and easier maintenance troubleshooting.

An instrument loop diagram can be effective on any size project from one or two loops up to large and complex installations. It can present on one sheet all the information or references to the information needed for installation, checkout, start-up and maintenance. Without the use of an instrument loop diagram, that information is spread among many other documents and is not readily available. Updating this single diagram to "as built" status is more easily achieved than updating the variety of other documents.

This standard does not mandate the style and content of instrument loop diagrams, but rather it is a consensus concerning their generation. As such, it has the same strengths and weaknesses as other consensus standards. Its primary strength is that the format and content guidelines apply to the majority of instrumentation applications. Its weakness is that it is not specific enough to satisfy the special requirements of particular interest groups.

The ISA Standards Committee on Instrument Loop Diagrams operates within the ISA Standards and Practices Department. This committee is appreciative of the work of previous SP5.4 committees and has tried to treat their work with respect. This committee would like to acknowledge the work of the SP5.1 committee in developing ISA-5.1, Instrumentation Symbols and Identification. One of our major goals has been to have the ISA 5.4 standard conform to the revised 5.1 standard.

Contents

1 Purpose

1.1 Provide guidelines. This standard will provide guidelines for the preparation and use of instrument loop diagrams in the design, construction, start-up, operation, maintenance, and modification of instrumentation systems.

1.2 Assist understanding. This standard will assist the understanding of instrument loop diagrams and improve communications among technical, non-technical, management, design, construction, operating, and maintenance personnel.

2 Scope

2.1 Additional information for individual loop. This standard establishes minimum required information and identifies additional optional information for a loop diagram for an individual instrumentation loop. This loop is typically part of a process depicted on the class of engineering drawings referred to as Piping and Instrument Drawings (P&IDs).

2.2 Suitability. This standard is suitable for use in the chemical, petroleum, power generation, air conditioning, metal refining, and many other industries.

2.3 Specialty fields. Certain fields, such as astronomy, navigation, and medicine, use very specialized instruments that are different from the conventional industrial process instruments. No specific effort to have this standard meet the requirements of those fields has been made. However, this standard is flexible enough to meet many of the needs of specialty fields.

3 Applications

3.1 Serve many purposes. Loop diagrams serve many purposes. Several of these stated below are in the chronology of project development.

3.2 Design

1) Illustrate control philosophy and confirm the completeness of submitted data
2) An extension of P&IDS, which show the components and accessories of the instrument loop, connections between devices, and identification of component action
3) The specification of instrument hardware items and a means of communicating requirements to vendors

3.3 Construction

1) Panel instrumentation interconnections and checkout diagram