INTERNATIONAL STANDARD

ISO 15519-2

First edition
2015-06-01

Specifications for diagrams for process industry —

Part 2: Measurement and control

Spécifications pour schémas de l'industrie de traitement —

Partie 2: Mesurage et contrôle

Reference number
ISO 15519-2:2015(E)

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: Foreword — Supplementary information.

The committee responsible for this document is ISO/TC 10, *Technical product documentation*, SC 10, *Process plant documentation*.

ISO 15519 consists of the following parts, under the general title *Specifications for diagrams for process industry*:

— *Part 1: General rules*

— *Part 2: Measurement and control*

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Introduction

0.1 General

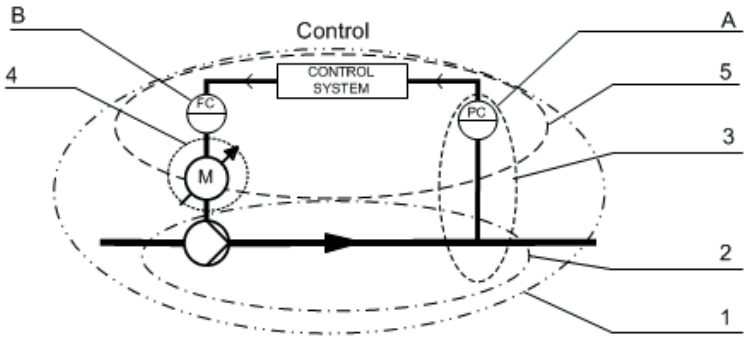
The ISO 15519 series consists of standards for specification of diagrams for process industry, published under the general title: Specification for diagrams for process industry.

This International Standard specifies preparation of different types of diagrams and use of graphical symbols, letter codes, and reference designation in diagrams. This International Standard addresses all process industry fields for example chemical, petrochemical, power, pharmaceutical, foodstuff, pulp, and paper.

This part of ISO 15519 deals with representation of measurement, actuation, and control in process diagrams which in this context covers process flow diagrams (PFD), process and instrument diagrams (PID), process control diagrams (PCD), and typical diagrams (TYD).

0.2 Engineering interrelations

Process diagrams, which represent the configuration of the process system and of the measurement, actuation, and control systems, involves engineering disciplines like process, mechanical, instrumentation, electrical, and control as illustrated in Figure 1.



Key

1 process
2 mechanical
3 instrumentation
4 electrical
5 control
A measurement
B actuation

Figure 1 — Interrelations between engineering disciplines

Figure 1 illustrates the discipline complexity of process systems which force diagrams not only to focus on individual disciplines but overlap to neighbouring disciplines. This is, for example, done in the process and instrumentation diagram which shows mechanical, instrumentation, and electrical objects in same diagram.

As process engineering by tradition is an ISO discipline and control engineering is IEC discipline representation of measurement and control in diagrams need to be coordinated and unambiguously.

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0.3 Control system technology and influence on documentation

The technological development within Information Technology constantly challenges the process industry to use "state of the art" technology for engineering of process and control systems. This puts pressure on the standardization organisations to deliver up to date International Standards. As development time and expected lifetime of a standard at present is overtaken several times by the IT development, the standard developers need to develop standards which focus on basic principles and rules to secure high quality documentation and exchange of information.

At present, the configuration and functionality of the process control system are programmed direct in modern control system as control Programmable Logic Controller (PLC) and Distributed Control Systems (DCS). In addition, these systems are self-documenting which could lead to the assumption that traditional diagram documentation are superfluous.

Diagrams are however an important tool for documentation and representation of process system information in all lifecycle phases of a process plant. In the development and engineering phase, diagrams are used also for exchange and sharing of technical information between engineering disciplines and in operation and maintenance phases diagrams are used in daily operation and as part of operation and maintenance manuals.

0.4 Letter codes

ISO 14617-6, 7.3.1 have been moved to this part of ISO 15519 and the description has been changed to "Letter codes for Process Control Information (PCI)".

ISO 14617-6 will be revised at first periodical review or revision after publication of this International Standard.

0.5 Figures

Figures in this International Standard are only examples for illustration of a given rule in the standard.

0.6 Reference designation

In this part of ISO 15519, IEC 81346-1, IEC 81346-2, and ISO/TS 81346-3 are used to illustrate the application of reference designation in diagrams.

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Specifications for diagrams for process industry —

Part 2:
Measurement and control

1 Scope

This part of ISO 15519 provides rules and guidelines for representation of measurement, control, and actuation in diagrams for process industry.

General rules and guidelines for preparation of diagrams for process industry, for example types and descriptions of diagrams, layout of diagrams, graphical symbols, lines and connection, reference designation, are given in ISO 15519-1.

Rules and guidelines for preparation of electrotechnical diagrams are given in IEC 61082-1.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 10209, *Technical product documentation — Vocabulary — Terms relating to technical drawings, product definition and related documentation*

ISO 14617 (all parts), *Graphical symbols for diagrams*

ISO 15519-1, *Specification for diagrams for process industry — Part 1: General rules*

IEC 81346-1, *Industrial systems, installations and equipment and industrial products — Structuring principles and reference designations — Part 1: Basic rules*

IEC 81346-2, *Industrial systems, installations and equipment and industrial products — Structuring principles and reference designations — Part 2: Classification of objects and codes for classes*

ISO/TS 81346-3, *Industrial systems, installations and equipment and industrial products — Structuring principles and reference designations — Part 3: Application rules for a reference designation system*

3 Terms, definitions, and abbreviated terms

For the purposes of this document, the terms and definitions given in ISO 15519-1, ISO 10209, IEC 81346-1, and the following apply.

3.1 Terms related to control

3.1.1
actuator
functional unit that generates from the controller output variable the manipulated variable to drive the final controlling element

Note 1 to entry: If the final controlling element is mechanically actuated, it is controlled via an actuated drive. The actuator drives the actuating drive in this case.

Note 2 to entry: See Annex E for the relationship between related terms.

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