

Symbolic representation for process measurement control functions and instrumentation —

Part 1: Basic requirements —

[ISO title: Process measurement control
functions and instrumentation —
Symbolic representation]

UDC 53.08:621.2:003.62

Cooperating organizations

The Industrial Process Measurement and Control Standards Committee, under whose direction this British Standard was prepared, consists of representatives from the following Government department and scientific and industrial organizations:

- British Gas Corporation
- British industrial Measuring and Control Apparatus Manufacturers' Association*
- British Steel Corporation
- CBMPE*
- Control and Automation Manufacturers' Association (BEAMA)
- Department of industry (Computers Systems and Electronics)
- Electrical, Electronic, Telecommunications and Plumbing Union
- Electricity Supply Industry in England and Wales
- Electronic Engineering Association
- Engineering Equipment Users' Association*
- Institute of Measurement and Control*
- Institution of Electrical Engineers*
- Institution of Gas Engineers*
- Oil Companies Materials Association*
- Post Office Engineering Union
- Scientific Instrument Manufacturers' Association*
- Sira Institute

The organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

- Association of Consulting Engineers
- Chemical industries Association
- Ministry of Defence
- The Transmission and Distribution Association (BEAMA)

This British Standard, having been prepared under the direction of the Industrial Process Measurement and Control Standards Committee, was published under the authority of the Executive Board and comes into effect on 30 November 1979

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First published December 1950
First revision March 1964
Second revision 30 November 1979.
The following BSI references relate to the work on this standard:
Committee reference PCL/4
Draft for comment 78/28752 DC

ISBN 0 580 10980 1

Amendments issued since publication

Amd. No.	Date of issue	Comments

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National foreword

This British Standard has been prepared under the direction of the Industrial Process Measurement and Control Standards Committee. It was first published in 1950 and subsequently revised in 1964. This revision is identical with ISO 3511/I-1977 *“Process measurement control functions and instrumentation — Symbolic representation — Part I: Basic requirements”* published by the International Organization for Standardization (ISO).

Terminology and conventions. The text of the international standard has been approved as suitable for publication, without deviation, as a British Standard. Some terminology and certain conventions are not identical with those used in British Standards; attention is especially drawn to the following:

Wherever the words “International Standard” appear, referring to this standard, they should be read as “British Standard”.

Cross-references

International standard	Corresponding British Standard
IEC 117	BS 3939 Graphical symbols for electrical power, telecommunications and electronics diagrams (Technically equivalent)
ISO/R 128-1959	BS 308 Engineering drawing practice Part 1:1972 General principles (Technically equivalent)

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 14, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

0 Introduction

This International Standard has been devised to provide a universal means of communication between the various interests involved in the design, manufacture, installation and operation of measurement and control equipment used in the process industries.

Requirements within the industries vary considerably, and in recognition of this, this International Standard is presented in three parts as follows:

- *Part I: Basic requirements (directed towards the needs of those whose prime interest is in basic measurement and control means);*
- *Part II: Extension of basic requirements;*
- *Part III: Detailed symbols.*

The three parts together are intended

- a) to meet the requirements of those who, possibly employing more sophisticated measurement and control means, may wish to depict such aspects as the measurement techniques embodied in a particular instrument, or the means — hydraulic, pneumatic, electrical, mechanical — used for its actuation;
- b) to provide standard symbolic representation for process measurement control functions and instrumentation. These symbols are not intended to replace graphic symbols for electrical equipment as contained in IEC Publication 117.

1 Scope and field of application

Part 1 of this International Standard establishes a symbols system for use in depicting the basic functions of measurement and control equipment in relation to the plant with which it is associated. The system has been intentionally limited to the identification of instrument functions and does not provide means of illustrating specific instruments.

2 Definitions

The following definitions are used solely for the purpose of this International Standard to assist in the application and understanding of the symbol system.

2.1

point of measurement

the point in a process at which a measurement is or may be made

2.2

instrument

a device or combination of devices used directly or indirectly to measure, display and/or control a variable. This term does not apply to internal components of the instruments, for example resistor or receiver bellows

2.3

panel-mounted instrument

an instrument that is mounted in a group normally accessible to the operator

2.4

locally mounted instrument

an instrument that is not panel mounted

2.5

correcting unit

the unit comprising those elements (actuating and correcting) which adjust the correcting conditions, in response to a signal from the controller

2.6

actuating element

that part of the correcting unit which adjusts the correcting element, for example a response to a signal from the controller

2.7**correcting element**

that part of the correcting unit which directly adjusts the value of the correcting conditions

2.8**alarm**

a device which is intended to attract attention to a defined abnormal condition by means of a discrete audible and/or visible signal, but which does not itself institute corrective action

2.9**set value**

the value of the controlled condition to which the controller is set

3 Size and outline of basic symbols

The symbol requirements given below have been adopted to provide for legibility and ease of drawing. If diagrams are to be photographically reduced, then these sizes should be correspondingly larger.

3.1 Point of measurement

The symbol is a thin line connected to a flow line or to a plant equipment outline. If not connected to an instrument symbol, an identifying letter shall be placed close to this to designate the measurable property. The letters used shall comply with the table.

The location of the symbol shall be functionally correct and placed in the correct process sequence but need not illustrate the geographical position.

However, where it is desirable, for clarification, to identify the location of the point of measurement within a plant equipment outline, a small circle of approximately 2 mm diameter may be used at this point at the end of the thin line as shown in the figures in **6.1.7** and **6.9**.

3.2 Instrument

The symbol comprises:

- a thin line circle of approximately 10 mm diameter;
- a letter code showing the property measured and function (see clause 4).

A number may be included to facilitate identification. Where the letter code/identification number cannot be accommodated within the circle, the circle may be broken.

3.3 Panel-mounted instrument

The symbol is a thin line circle of approximately 10 mm diameter with a horizontal thin line across it. The line may be located at any height within the circle.



NOTE For an instrument mounted inside a control panel, the above symbol may include a second horizontal line.

3.4 Correcting element

The symbol for a correcting element of unspecified type is an equilateral triangle with sides of approximately 5 mm length.



When the type of correcting element is known, established symbols depicting particular correcting elements may be used, for example for a valve:

