भारतीय मानक

Indian Standard

IS 8493 : 2024
IEC 60381-2 : 1978

औद्योगिक प्रक्रिया माप और नियंत्रण प्रणालियों के लिए एनालॉग डीसी वोल्टेज सिग्नल

(पहला पुनरीक्षण)

Analogue d.c. Voltage Signals for Industrial Process Measurement and Control Systems

(First Revision)

ICS 33.200; 35.240.50

भारतीय मानक ब्यूरो
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NATIONAL FOREWORD

This Indian Standard (First Revision) which is identical to IEC 60381-2 : 1978 'Analogue signals for process control systems — Part 2: Direct voltage signals' issued by the International Electrotechnical Commission (IEC) was adopted by the Bureau of Indian Standards on the recommendation of the Industrial Process Meas urement and Control Sectional Committee and approval of the Electrotechnic al Division Council.

This standard was first published in 1977. This revision has been undertaken to harmonize it with the latest developments that have taken place at international level.

The text of IEC standard has been approved as suitable for publication as an Indian Standard without deviations. Certain terminologies and conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'; and

b) Comma (,) has been used as a decimal marker, while in Indian Standards the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to International Standards for which Indian Standards also exists. The corresponding Indian Standards, which are to be substituted, are listed below along with their degree of equivalence for the editions indicated:

Only the English language text has been retained while adopting it in this Indian Standard, and as such, the page numbers given here are not the same as in the IEC publication.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding of numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the s pecified value in this standard .

Indian Standard

ANALOGUE SIGNALS FOR PROCESS CONTROL SYSTEMS

PART 2 DIRECT VOLTAGE SIGNALS

1. Scope

This standard specifies analogue direct voltage signals used in industrial process measurement and control systems to transmit information between the elements of systems.

Contrary to the analogue direct current signal as specified in IEC Publication 381, Analogue D.C. Current Signals for Process Control Systems, the analogue direct voltage signal is not intended for transmission over long distances.

This standard does not apply to signals used entirely within an element.

2. Definitions

2.1 *Elements of industrial process measurement and control systems*

Functional units, or integrated combinations thereof, which ensure the transducing, transmitting or processing of measured values, control quantities, control variables and reference variables.

2.2 *Analogue direct voltage signal*

A direct voltage signal used for transmission or processing which varies in a continuous manner according to one or several physical quantities.

2.3 *Measured value of an analogue direct voltage signal*

The mean value during a stated duration.

2.4 *Lower limit*

The signal voltage corresponding to the minimum value of the direct voltage signal.

2.5 *Upper limit*

The signal voltage corresponding to the maximum value of the direct voltage signal.

2.6 *Range of an analogue direct voltage signal*

The range determined by the lower limit and the upper limit of the signal voltage.

2.7 *Load impedance*

The resultant of the impedances of all connected receivers.

2.8 *Ripple content*

The ratio between the peak-to-peak value of the alternating component and the upper limit of the direct voltage signal.

2.9 *Signal common*

A number of signal circuits may have common electrical connection. This is the signal common, which may or may not be connected to earth.

2.10 *Signal isolation*

The absence of an electrical connection between the signal circuit and all other circuits and earth.

3. Specified values

3.1 *Ranges of analogue direct voltage signals*

The ranges of analogue direct voltage signals shall be as given in Table I.

TABLE I

Ranges of analogue direct voltage signals

Lower limit (V)	Upper limit (V)
+ 1	+ 5 [1]
0	+ 5 [1]
0	+10 [1]
−10	+10 [2]

[1] Voltage signals which can be derived from the direct current signals specified in IEC Publication 381.

[2] Voltage signal which can represent physical quantities with inherent bipolar nature.

3.2 *Ripple content*

The following values, applicable when using a ripple free d.c. power supply, should be specified:

a) the ripple content within a system element and its frequencies;

b) the noise generated internally within a system element and its frequencies.

The ripple content resulting from the d.c. power supply ripple should also be specified.

3.3 *Signal common*

For unipolar signals, the signal negative should be the signal common. If the signal common is connected to a d.c. power supply, it should be connected to the power supply negative.

For bipolar signals, the signal neutral should be the signal common. If the signal common is connected to a d.c. power supply, it should be connected to the power supply neutral.

3.4 *Earthing*

For unipolar signals, if the element is to be earthed, the signal negative and/or the d.c. power supply negative, or neutral where appropriate, should be earthed.

For bipolar signals, if the element is to be earthed, the signal neutral and/or the d.c. power supply neutral should be earthed.

Bureau of Indian Standards

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Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the website-www.bis.gov.in or www.standards.bis.in.

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Amendments Issued Since Publication

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