
INTERNATIONAL STANDARD



1059

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Numerical control of machines — Punched tape fixed block format for positioning and straight-cut machining

First edition — 1973-12-01

UDC 681.327.44 : 681.323 : 621.9-52

Ref. No. ISO 1059-1973 (E)

Descriptors : data processing, numerical control, punched tapes, data layout, coding.

FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up 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.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

Prior to 1972, the results of the work of the Technical Committees were published as ISO Recommendations; these documents are now in the process of being transformed into International Standards. As part of this process, Technical Committee ISO/TC 97, *Computers and information processing*, has received ISO Recommendation R 1059-1969 and found it technically suitable for transformation. International Standard ISO 1059 therefore replaces ISO Recommendation R 1059-1969, which was approved by the Member Bodies of the following countries :

Australia	Iran	Portugal
Belgium	Israel	Spain
Czechoslovakia	Italy	Sweden
Denmark	Japan	Switzerland
Egypt, Arab Rep. of	Netherlands	Turkey
France	New Zealand	United Kingdom
Germany	Poland	U.S.A.

No Member Body expressed disapproval of the Recommendation.

Numerical control of machines – Punched tape fixed block format for positioning and straight-cut machining

1 SCOPE AND FIELD OF APPLICATION

1.1 This International Standard applies to fixed block format punched tapes, with or without tabulation and without word address, for positioning and straight-cut machining; it is intended to

- a) recommend application of the rules providing a minimum of uniformity in the manufacture of input media;
- b) inform users of numerically controlled machines on the potentialities of control systems.

1.2 Compliance with the conditions expressed in this International Standard does not guarantee interchangeability of media between machines of compatible features. The choice of the codes corresponding to “feed function”, “spindle speed function”, “preparatory function”, “miscellaneous function” and “tool function” is free. Nevertheless, when it is justified by the complexity of functions, it is recommended that ISO 1058 be complied with as far as possible.

1.3 The format characteristics are specified in clause 4 and in annexes C and D.

1.4 The technical terms used in this International Standard are based on the ISO data processing vocabulary¹⁾.

1.5 Tape dimensions, character codes and nomenclature of axes conform respectively to ISO 1154 and ISO 1729, ISO 840 and ISO 1113, and ISO 841.

2 REFERENCES

ISO 840, *Numerical control of machines – 7-bit coded character set*.

ISO 841, *Numerical control of machines – Axis and motion nomenclature*.

ISO 1056 *Numerical control of machines – Punched tape block formats – Coding of preparatory functions G and miscellaneous functions M*.²⁾

ISO 1058, *Numerical control of machines – Punched tape variable block format for positioning and straight-cut machining*.

ISO 1113, *Information processing – Representation of 6- and 7-bit coded character sets on punched tape*.

ISO 1154, *Information processing – Punched paper tape – Dimensions and location of feed holes and code holes*.

ISO 1729, *Information processing – Unpunched paper tape – Specification*.

3 FORMAT MAKE-UP

3.1 Blocks

A fixed format block has a constant length. Consequently, no word can be omitted, even if there is no change in the data with respect to the preceding block. The meaning of a character is defined by its position in the block. The block shall contain no alphabetic character.

3.1.1 A block consists of the following :

3.1.1.1 The “sequence number” word (optional).

3.1.1.2 The “block address” word (optional).

3.1.1.3 The data words.

3.1.1.4 The “end of block” character, showing the end of each block. In addition, the “end of block” character must precede the first block of the program.

3.1.2 The data words must not be repeated within the same block. Only words corresponding to a function provided by the machine are used; their order should be as follows :

¹⁾ In preparation.

²⁾ At present at the stage of draft. (Revision of ISO/R 1056.)

3.1.2.1 The “preparatory function” word.¹⁾

3.1.2.2 The “dimension” words.

These words should be arranged whenever possible in the following sequence : X, Y, Z, U, V, W, P, Q, R, A, B, C, D, E, as defined in annex B.

3.1.2.3 The “feed function” word or words.

3.1.2.4 The “spindle speed function” word.

3.1.2.5 The “tool function” word.

3.1.2.6 The “miscellaneous function” word.¹⁾

3.2 Words

3.2.1 The length of each specific word and the position of the implicit decimal sign, as defined in the format specification, shall remain constant. Hence, to keep up the afore mentioned length, the relevant number of zeros must be included.

3.2.2 There is no address for the words. Optionally, the “tab” character may be used to facilitate the reading of the manuscript.

3.2.3 The “block address” word shall consist of one (1) digit.

3.2.4 The “dimension” words shall be either co-ordinate dimension words (absolute dimension) or incremental dimension words (relative dimension) according to format specification, and shall contain digital data as follows :

3.2.4.1 The most significant digit of the dimension shall be first.

3.2.4.2 Units

3.2.4.2.1 All linear dimensions shall be expressed in millimetres or inches and decimal fractions thereof.

3.2.4.2.2 All angular dimensions shall be expressed in decimal parts of a revolution or in degrees and decimal parts of a degree; decimal parts of a revolution is recommended practice.

3.2.4.3 Decimal sign

Decimal sign shall not be used, its implicit position being defined by the format specification.

3.2.4.4 Sign of linear and angular dimensions

3.2.4.4.1 When the control system allows using absolute dimensions either positive or negative with respect to the origin of the co-ordinate system, the algebraic sign (+ or −) is part of the “dimension” word and shall precede the first digit.

3.2.4.4.2 When the control system only permits use of positive absolute dimensions, the algebraic sign shall be omitted from the “dimension” words.

3.2.4.4.3 When the control system uses incremental dimensions, the algebraic sign (+ or −) is compulsory and shall precede the first digit of each dimension in order to show the direction of motion.

3.2.5 Digital data contained in the non-dimension words are unrestricted. However, it is recommended to comply as much as possible with the following indications :

3.2.5.1 The “sequence number” should consist of three (3) digits.

3.2.5.2 The “preparatory function” should be expressed by a two (2)-digit coded number.¹⁾

3.2.5.3 The “feed function or functions” should be expressed by a coded number, the composition of which is described in annex A.

3.2.5.4 The “spindle speed function” should be expressed by a coded number, the composition of which is described in annex A.

3.2.5.5 The “tool function” should be expressed by a coded number, the number of digits being specified in the format specification.

3.2.5.6 The “miscellaneous function” should be expressed by a two (2)-digit coded number.¹⁾

4 FORMAT SPECIFICATION

This consists of three sections, as follows :

- format classification shorthand, in accordance with annex C;
- format classification detailed shorthand, in accordance with annex D;
- itemized data of the format contents, which are not subject to standardization. An explanatory note is attached for guidance of users (annex F).

NOTE — Annex E shows an example of a tab fixed block format.

1) For coding of preparatory and miscellaneous functions, see ISO 1056.