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**Technical drawings—
General principles of presentation**

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of International Trade and Industry through deliberations at Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law. Consequently **JIS Z 8316 : 1984** is replaced with **JIS Z 8316 : 1999**.

This revision has been equivalent to **ISO 128 : 1982** *Technical drawings—General principles of presentation* except for that extra thick line was added to the types of lines, thin section can be represented with extra thick line, imaginary intersection is represented with continuous thick line and some portions were given with dotted underlines.

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Technical drawings— General principles of presentation

Introduction This Japanese Industrial Standard has been prepared based on the first edition issued in 1982 of "ISO 128, *Technical drawings—General principles of presentation*" without changing the technical contents, except for that extra thick line was added to the types of lines, thin section can be represented with extra thick line and imaginary intersection is represented with continuous thick line.

The description underlined with a dotted line in this Standard is not included in the original International Standard.

1 Scope This Standard specifies the general principles of presentation to be applied to technical drawings following the orthographic projection methods.

Additional standards are under preparation for other methods of representation.

This Standard is intended for all kinds of technical drawings (mechanical, electrical, architectural, civil engineering, etc.). However, it is recognized that in some specific technical areas the general rules and conventions cannot adequately cover all the needs of specialized practices, and that additional rules are required which may be specified in separate standards. For these areas the general principles should however, be respected in order to facilitate international exchange of drawings and to ensure the coherence of drawings in a comprehensive system relating to several technical functions.

Attention has been given in this Standard to the requirements of reproduction, including microcopying.

2 Views

2.1 Designation of views

View in direction a = View from the front

View in direction b = View from above

View in direction c = View from the left

View in direction d = View from the right

View in direction e = View from below

View in direction f = View from the rear

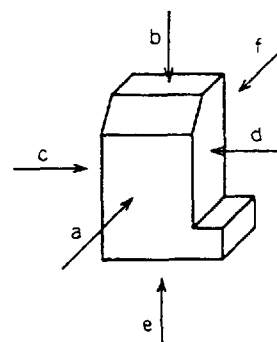


Fig. 1

The front view (principal view) having been chosen (see 2.4), the other customary views make with it and between themselves angles of 90° or multiples of 90° (see Fig. 1).

2.2 Relative position of views Two alternative orthographic projection methods, of

equal standing, can be used :

- the first angle projection method (formerly referred to as method E),
- the third angle projection method (formerly referred to as method A).

Remarks 1 Each of the first angle and third angle projection methods can be used equally, for uniformity among the figures given through this Standard, however, those have been provided by the third angle projection method.

Informative reference : In ISO 128, the figures are provided by the first angle projection method.

- 2 The figures shown are not intended as design examples and are depicted in the simplest form to illustrate the text.

2.2.1 First angle projection method With reference to the front view (a), the other views are arranged as follows (see Fig.2):

The view from above (b), is placed underneath

The view from below (e), is placed above

The view from the left (c), is placed on the right

The view from the right (d), is placed on the left

The view from the rear (f) may be placed on the left, or on the right, as convenient.

The distinguishing symbol of this method is shown in Fig. 3.

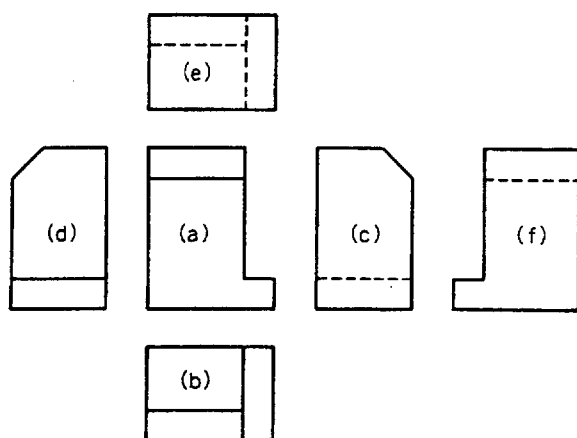


Fig. 2



Fig. 3

2.2.2 Third angle projection method With reference to the front view (a), the other views are arranged as follows (see Fig. 4):

The view from above (b), is placed above

The view from below (e), is placed underneath

The view from the left (c), is placed on the left

The view from the right (d), is placed on the right

The view from the rear (f) may be placed on the left, or on the right, as convenient.

The distinguishing symbol of this method is shown in Fig. 5.

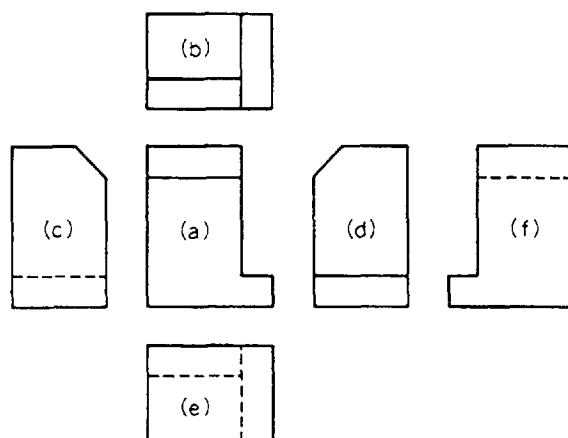


Fig. 4

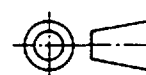


Fig. 5

2.2.3 Layout of views using reference arrows In those cases where it is an advantage to position the views not according to the strict pattern of the first or the third angle projection methods, the use of reference arrows permits the various views to be freely positioned.

With the exception of the principal view, each view shall be identified by a capital letter which is repeated near the arrow needed to indicate the direction of viewing for the relevant view.

The designated views may be located irrespective of the principal view. The capital letters identifying the referenced views shall be placed either immediately below or above the relevant views. In any one drawing the references shall be placed in the same way. No other indication is necessary (see Fig. 6).

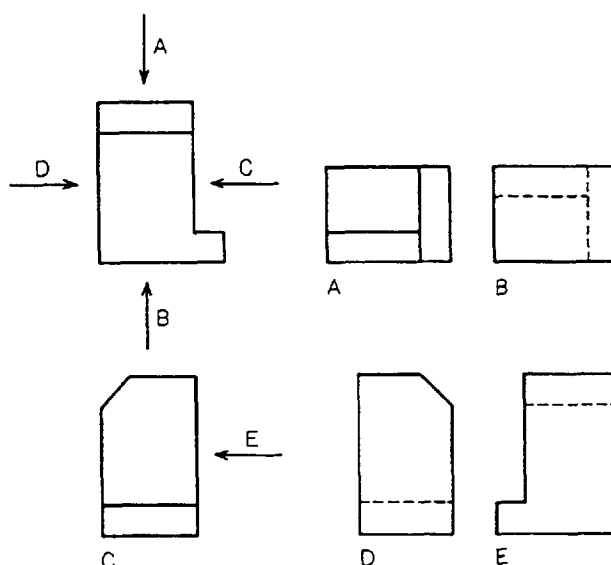


Fig. 6

2.3 Indication of method Where one of the methods specified in 2.2.1 and 2.2.2 is being used, the said method must be indicated on the drawing by means of its distinguishing symbol as shown in Fig. 3 or Fig. 5.

The symbol shall be placed in a space provided for the purpose in the title block of the drawing.

For the layout of views using reference arrows specified in 2.2.3, no distinguishing symbol is required.

2.4 Choice of views The most informative view of an object shall be used as the front or principal view. Generally, this view shows the part in the functioning position. Parts which can be used in any position should preferably be drawn in the main position of manufacturing or mounting.

When other views (including sections) are needed, these shall be selected according to the following principles :

- to limit the number of views and sections to the minimum necessary and sufficient to fully delineate the object without ambiguity ;
- to avoid the need for hidden outlines and edges ;
- to avoid the unnecessary repetition of detail.

2.5 Special views If a direction of viewing different from those shown in 2.1 is necessary, or if a view cannot be placed in its correct position using the methods shown in 2.2.1 and 2.2.2, reference arrows as indicated in 2.2.3 shall be used for the relevant view (see Fig. 7 and Fig. 8).

Whatever the direction of viewing, the capital letters referencing the views shall always be positioned normal to the direction of reading.

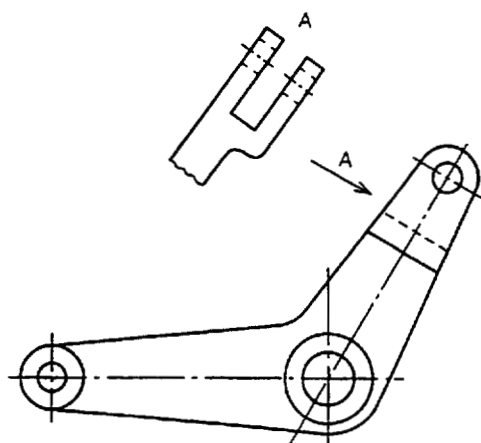


Fig. 7

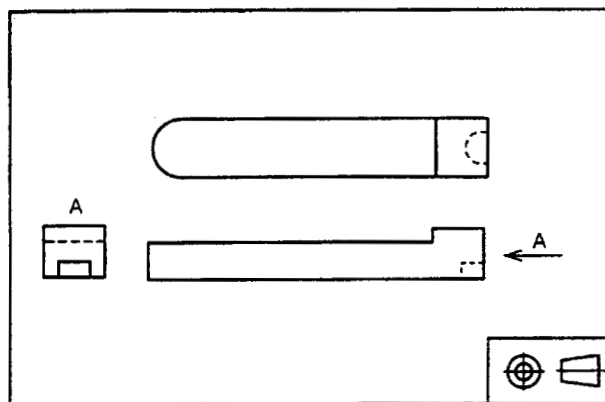


Fig. 8

2.6 Partial views Partial views may be where complete views would not improve the information to be given. The partial view shall be cut off by a continuous thin freehand line (type C) or straight lines with zigzags (type D) (see Fig. 7, Fig. 9, Fig. 10 and others).

2.7 Local views Provided that the presentation is unambiguous, it is permitted to give a local view instead of a complete view for symmetrical items. The local view should be drawn in third angle projection, regardless of the arrangement used for the general execution of the drawing.

Local views shall be drawn with continuous thick lines (type A), and shall be connected to the principal view by a center line (type G1). Examples of local views are shown in the Fig. 41, Fig. 42, Fig. 43 and Fig. 44.

3 Lines

3.1 Types of lines Only the types and thicknesses of line shown in Table 1 shall be used. However the extra thick line can be used as necessary.

In cases where other types or thicknesses of line are used for special fields (for example electrical or pipe-work diagrams), or if the lines specified in Table 1 are used for applications other than those detailed in the right column of Table 1 the conventions adopted must be indicated in other standards or explained by notes on the drawing concerned.

Typical applications of different types of lines are shown in Fig. 9 and Fig. 10.

Informative reference : In ISO 128, only the thin and thick lines are specified.