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JIS B 0125-2 : 2001

(ISO 1219-2 : 1995)

(JFPA/JSA)

**Fluid power systems and
components—
Graphic symbols and
circuit diagrams—
Part 2 : Circuit diagrams**

ICS 01.080.30; 23.100.01

Descriptors : hydraulically-operated devices, pneumatically-operated devices,
engineering drawings, diagrams

Reference number : JIS B 0125-2 : 2001 (E)

Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee according to the proposal of establishing a Japanese Industrial Standard from Japan Fluid Power Association (JFPA)/the Japanese Standards Association (JSA), with a draft of Industrial Standard based on the provision of Article 12 Clause 1 of the Industrial Standardization Law.

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In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

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Fluid power systems and components— Graphic symbols and circuit diagrams— Part 2 : Circuit diagrams

Introduction This Japanese Industrial Standard has been prepared based on the first edition of **ISO 1219-2** *Fluid power systems and components—Graphic symbols and circuit diagrams—Part 2 : Circuit diagrams* published in 1995, without modifying the technical contents.

1 Scope This part of **JIS B 0125** establishes the main rules for drawing hydraulic and pneumatic diagrams using symbols from **JIS B 0125-1**.

Remarks : The International Standard corresponding to this Standard is given below.

In addition, abbreviations which denote the degree of correspondence in the contents between the relevant International Standard and JIS are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21**.

ISO 1219-2 : 1995 *Fluid power systems and components—Graphic symbols and circuit diagrams—Part 2 : Circuit diagrams* (IDT)

2 Normative references The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. If the indication of the year of coming into effect is given to these referred standards, only the edition of indicated year constitutes the provision of this Standard but the revision and amendment made thereafter are not applied. The normative references without the indication of the year of coming into effect apply limiting only to the most recent edition (including the amendment).

JIS B 0125-1 *Fluid power systems and components—Graphic symbols and circuit diagrams—Part 1 : Graphic symbols*

Remarks : **ISO 1219-1** : 1991 *Fluid power systems and components—Graphic symbols and circuit diagrams—Part 1 : Graphic symbols* is identical with the said standard.

JIS B 0142 *Glossary of terms for oil hydraulics and pneumatics*

Remarks : The provisions cited from **ISO 5598** : 1985 *Fluid power systems and components—Vocabulary* are equivalent to the corresponding provisions of the said standard.

JIS K 2001 *Industrial liquid lubricants—ISO viscosity classification*

Remarks : **ISO 3448** : 1992 *Industrial liquid lubricants—ISO viscosity classification* is identical with the said standard.

JIS Z 8311 *Technical drawings—Sizes and layout of drawing sheets*

Remarks : **ISO 5457** : 1980 *Technical drawings—Sizes and layout of drawing sheets* is identical with the said standard.

JIS Z 8313-1 *Technical drawings—Lettering—Part 1 : Currently used characters*

Remarks : **ISO 3098-1** : 1974 *Technical drawings—Lettering—Part 1 : Currently used characters* is identical with the said standard.

ISO 6743-4 : 1982 *Lubricants, industrial oils and related products (class L)—Classification—Part 4 : Family H (Hydraulic systems)*

IEC 60848 : 1988 *Preparation of function charts for control systems*

3 Definitions For the purposes of this part of **JIS B 0125**, the definitions given in **JIS B 0142** and the following definitions apply.

3.1 actuator Component (for example, motor, cylinder) that transforms fluid energy into mechanical energy.

3.2 component Individual unit (for example, cylinder, motor, valve, filter), comprising one or more parts designed to be a functional part of a fluid power system.

3.3 piping Any combination of fittings, couplings or connectors with pipes, hoses or tubes which allows fluid flow between components.

3.4 system Arrangement of interconnected components which transmits and controls fluid power energy.

4 General rules

4.1 Presentation The diagrams shall be clear and shall make it possible to follow the circuits for all the movements and commands throughout the various sequences of the operating cycle.

All the hydraulic and pneumatic equipment, as well as their connections, shall be represented.

The diagrams need not take account of the physical arrangement of the equipment in an installation. Circuit information which includes diagrams and other related details should form a complete series of documents. This group of documents shall be identified by a common reference.

4.2 Format Presentation in A4 or A3 formats as described in **JIS Z 8311** is preferred. If formats other than A4 are required, the drawings shall be folded to A4 size following the method given in that standard. The use of other kinds of data media shall be agreed between the supplier and purchaser. Any references used shall be in accordance with **JIS Z 8313-1**.

4.3 Layout

4.3.1 Lines or connections between the different pieces of equipment should be drawn with minimum crossing points. Where they do cross, the representation specified in **JIS B 0125-1** shall be used.

4.3.2 The position of codes and indices should not overlap the space reserved for equipment and lines.

4.3.3 Dependent on the complexity of the system, a division into groupings, having related control functions, should be made.

A complete control function, including related actuators, should be represented on a single sheet, wherever possible. Provisions shall be made to identify connections of lines between sheets (see Annex B, pages 1/3 and 2/3, for example of coding for the identification of piping between consecutive sheets of the diagram).

The limits of a sub-assembly shall be defined by a dot-dash line.

4.3.4 Devices such as limit switches or limit valves activated by actuators should be shown at their place of action, for example at the cylinder, by a marking line and their identification code.

Where the direction of actuation is unidirectional, an arrow (→) shall be added to the marking line.

4.3.5 Hydraulic and pneumatic symbols of equipment should in principle be arranged from the bottom to top and from left to right in the following order:

- energy sources: bottom left;
- control components in sequential order: upwards from left to right;
- actuators: at the top from left to right.

4.4 Equipment

4.4.1 Symbols representing fluid power equipment shall be drawn in accordance with **JIS B 0125-1**.

If there is a detailed and a simplified symbol, only one representation shall be used on the same diagram.

4.4.2 Symbols shall be drawn as follows:

- for hydraulics: unless otherwise indicated, representing components in the ready to start position;
- for pneumatics: unless otherwise indicated, representing components in the ready to start position with pressure applied.

5 Rules for identification of equipment in fluid power circuits

5.1 General An identification code for the equipment shall be provided on the circuit diagram next to the respective symbol. It shall be used in all related documents.

5.2 Identification code of components (excluding piping) The following identification code for components shall be used if no other code is stipulated.

The identification code shall contain the following elements and should be enclosed in a box:

Installation No. _____

Circuit No. _____

Component code _____

Component No. _____

NOTE : See Annex A for information.

5.2.1 Installation number This code consists of numbers beginning with 1. This installation number shall be used if the whole circuit consists of more than one installation.

5.2.2 Circuit number This code consists of numbers. Preferably start with 0 for all accessories fitted on the power unit or supply. Continue with sequential numbers for the different fluid power circuits.

5.2.3 Component code Each component shall be clearly identified by a code in accordance with the following list:

Pumps and compressors:	P
Actuators:	A
Prime movers:	M
Sensors:	S
Valves:	V
All other equipment:	Z, or another letter, but not those shown above

5.2.4 Component number This code consists of numbers beginning with 1 and each component in a given circuit is numbered consecutively.

5.3 Function identification for piping The function shall be identified as follows:

- P for pressure supply lines;
- T for tank return lines (hydraulics);
- L for leakage drain lines (hydraulics).

All lines transmitting different pressures shall be additionally identified by numbers beginning with 1.

5.4 Port and piping connection identification Ports shall be identified on the circuit diagram by the characters indicated on the components, on the subplates or on the manifolds.

Piping connections between sub-assemblies shall also be identified.

6 Technical information At least the following information shall be included on the diagram next to the appropriate symbol.