

JIS

JAPANESE INDUSTRIAL STANDARD

**Symbols for Indications
Appearing on Machine Tools**

JIS B 6012—1974

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Symbols for Indications
Appearing on Machine Tools

B 6012-1974
(Reaffirmed: 1980)

1. Scope

This Japanese Industrial Standard specifies symbols for indications to be used on indicator plates of general machine tools, numerically controlled machine tools and the like, hereinafter referred to as the "symbols", and their designations.

Moreover, corresponding English terms are shown for information.

Symbols mean the graphical figures used instead of letters or sentences indicating the contents of operations.

Remark: Because the symbols can be used uniformly in all countries as distinguished from letters, on indicator plates the symbols should, preferably, be used. However, letters only or combinations of letters and symbols are not precluded from using.

2. Indication of Symbols

2.1 Forms and Dimensions of Symbols Symbols indicated in this standard specify the basic forms but do not specify dimensions of their sizes. However, in the case of different sizes, their forms should, preferably, be proportional to the indicated forms.

2.2 Combinations of Symbols Symbols indicated in this standard may be used by combining conveniently.

2.3 Arrows Arrows shall be of the following two types.

- (1) **Arrows Indicating Direction of Movement** These arrows are used in rectilinear motion, rotation and the like and their arrowhead angles shall be 30°.
- (2) **Arrows Indicating Operations and Functions** These arrows indicate the operations such as clamping, unclamping, setting, detaching and the like and their arrowhead angles shall be 60° or more and shafts of arrows shall be bold and short.

Reference Standards:

ISO R 369-Symbols for Indications Appearing on Machine Tools

ISO 2972-Symbols for Numerically Controlled Machine Tools

3. Classification

Symbols are divided into two main classes related to machine bodies and to numerical control and each class is classified as follows:

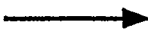
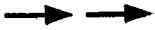
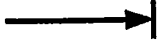
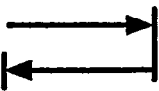
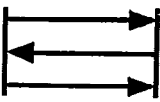
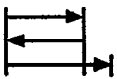
(Related to machine bodies)

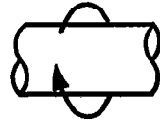
(1) Modes of motion, directions, orientations, speeds, etc.	(Number)
(1.1) Rectilinear motion and rotation	101 to 117
(1.2) Feed motion	121 to 136
(1.3) Cutting motion	151 to 164
(2) Elements as objects of operations	
(2.1) Work pieces and machine parts	201 to 216
(2.2) Spindles and quills	231 to 235
(3) Operations	
(3.1) Operations in general	301 to 311
(3.2) Engaging and disengaging	321 to 337
(3.3) Other operations	351 to 352
(4) Safety devices and cautions	401 to 407
(5) Other items related to machines	
(5.1) Lubrication, oil hydraulic pressure, and cutting fluid	501 to 507
(5.2) Instrumentation	521 to 525
(5.3) Other items	551 to 556
(6) Numerical control	
(6.1) Data carriers, programs	601 to 626
(6.2) Functions of numerical control	641 to 666

4. Symbols for Indications . Symbols for indications shall be as follows:

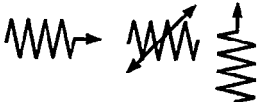
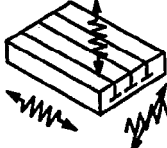
Remark: As for the symbols of elements as objects of operations whose actual forms are remarkably different from symbols may be modified into adequate forms.

4.1 Modes of Motion, Directions, Orientations, Speeds, etc.4.1.1 Rectilinear Motion and Rotation

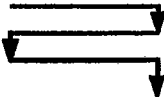
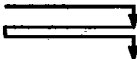
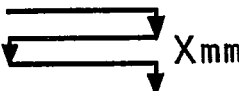
Number	Designation	Symbol	Remark	Informative reference (corresponding English)
101	Direction of rectilinear motion		When the direction of motion is opposite,  may be used.	direction of rectilinear motion
102	Rectilinear motion in two direction			rectilinear motion in two direction
103	Direction of interrupted rectilinear motion (inching)		When two directions 	interrupted rectilinear motion
104	Rectilinear motion to determined location		When rectilinear motion stops in two directions at its terminals 	limited rectilinear motion
105	Rectilinear motion and return between determined locations		Stop after one reciprocation.	limited rectilinear motion and return
106	Continuous reciprocating rectilinear motion		In the case where the final stop position exceeds the turning point 	oscillating rectilinear motion (continuous)
107	Direction of rotation			direction of rotation
108	Rotation in two direction			rotation in two direction

Number	Designation	Symbol	Remark	Informative reference (corresponding English)
109	Direction of interrupted rotation (inching)		When two direction, 	direction of interrupted rotation
110	Rotation to determined location		When rotation stops in two directions at its terminals 	limited rotation
111	Reciprocating rotatory motion between determined locations		Stop after one reciprocation.	limited rotation and return
112	Continuous reciprocating rotatory motion		In the case where the final stop position exceeds the turning point 	oscillating rotary motion (continuous)
113	Direction of shaft rotation		When interrupted rotation  In the case of main shaft, symbol may be changed to the symbol for indication of main shaft to be made as object.	direction of shaft rotation
114	Revolution (clockwise)		Counterclockwise revolution of continuous rotation 	revolution (clockwise)
115	One revolution			one revolution
116	Stop of rotation at determined location			oriented stop
117	Number of revolution per minute		Mark X is the value of the number of revolutions and may be not used or be collected in a table.	number of revolution per minute (spindle speed)

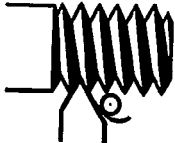
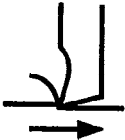
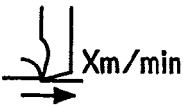
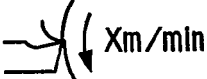
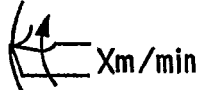
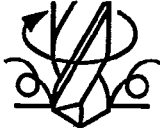
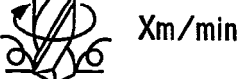
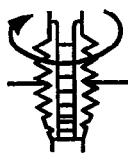
4.1.2 Feed Motion

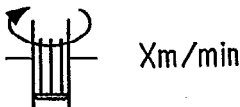
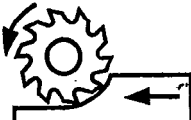
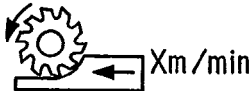
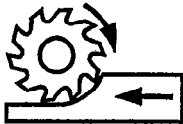
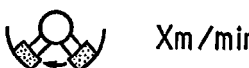
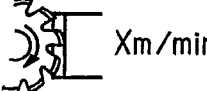
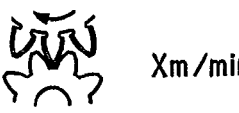
Number	Designation	Symbol	Remark	Informative reference (corresponding English)
121	Feed			feed
122	Feed per revolution		X is the numerical value of feed and may not be used or be collected in a table.	feed per revolution
123	Feed per minute			feed per minutes
124	Slow (reduced) feed		$\frac{1}{X}$ is the ratio of reduction in regard to normal feed and may not be used.	reduced feed
125	Normal feed		$\frac{1}{1}$ may not be used.	normal feed
126	Rapid (increased) feed		$\frac{X}{1}$ is the ratio of increase in regard to normal feed and may not be used.	rapid feed
127	Longitudinal feed		When the direction of feed is to be shown, 	longitudinal feed
128	Transverse feed		When object of operation (element) is shown together, 	transverse feed
129	Vertical feed			vertical feed

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Number	Designation	Symbol	Remark	Informative reference (corresponding English)
130	Rapid traverse			rapid traverse
131	Feed per stroke		When feed is made only at one end of stroke, 	feed per stroke
132	Feed per stroke mm	 Xmm	X is the numerical value of feed per stroke and may not be used or be collected in a table.	feed per stroke mm.
133	Increase of speed		For the indication of high speed zone and low speed zone (of rotation)  may be used.	increase of value (speed, for instance)
134	Decrease of speed			decrease of value (speed, for instance)
135	Tarry			tarry
136	Dwell			dwell

4.1.3 Cutting Motion

Number	Designation	Symbol	Remark	Informative reference (corresponding English)
151	Threading		When lefthand thread is indicated,  Marking of pitch shall be as given in number 523	threading
152	Planing		When cutting speed is to be shown,  When shaping, 	planing
153	Turning		When cutting speed is to be shown, 	turning
154	Boring		When cutting speed is to be shown,  When work piece rotation, 	boring
155	Drilling		When cutting speed is to be shown, 	drilling
156	Tapping		When cutting speed is to be shown, 	tapping

Number	Designation	Symbol	Remark	Informative reference (corresponding English)
157	Reaming		When cutting speed is to be shown, 	reaming
158	Conventional milling		When cutting speed is to be shown, 	conventional milling
159	Climb milling		When cutting speed is to be shown, 	climb milling
160	Grinding		When cutting speed is to be shown, 	grinding
161	Honing		When cutting speed is to be shown, 	honoring
162	Hobbing		When cutting speed is to be shown, 	hobbing
163	Gear shaving		When cutting speed is to be shown, 	gear shaving
164	Broaching		When cutting speed is to be shown, 	broaching

Remark: X is the numerical value of speed and may be collected in a table.