

## Plain limit gauges

**Introduction** This Japanese Industrial Standard is prepared based on ISO/DIS 1938-1, *Inspection of plain workpieces—Part 1: Plain limit gauges*, without any modification in technical contents except the measuring methods which have been specified in Japanese Industrial Standards. Further, the items not specified in the corresponding International Standard (acceptance or rejection by limit gauges, treatment of disagreement in decision of acceptance or rejection by limit gauges in a trade and designation of limit gauges) are added to this Japanese Industrial Standard.

**1 Scope** This Japanese Industrial Standard specifies plain limit gauges (hereafter referred to as "limit gauges") and reference disks for gap gauges (hereafter referred to as "reference disks") used for dimensional inspection of holes and shafts which are not exceeding 500 mm, and satisfy the conditions of envelope, and to which grades of tolerances IT<sub>6</sub> to IT<sub>16</sub> specified in JIS B 0401 are applied.

Remarks 1 The standards cited in this Standard are given in Attached Table 1.

- 2 The International Standard corresponding to this Standard is given below  
ISO/DIS 1938-1 *Inspection of plain workpieces—Part 1: Plain limit gauges*

### 2 Definitions and symbols

**2.1 Definitions** For the purpose of this Standard, in addition to the definitions specified in JIS B 0623, JIS B 0401, JIS B 0621 and JIS Z 8103, the following principal definitions apply:

- (1) **plain limit gauge** A gauge which has gauging surfaces based on maximum material limit and least material limit of hole or shaft.
- (2) **GO gauge** A limit gauge which has gauging surfaces based on maximum material limit (MML) of hole or shaft.

Remarks: The maximum material limit is equal to the minimum permissible size for a hole and to the maximum permissible size for a shaft.

- (3) **NOT GO gauge** A limit gauge which has gauging surfaces based on least material limit (LML) of hole or shaft.

Remarks: The minimum material limit is equal to the maximum permissible size for a hole and to the minimum permissible size for a shaft.

- (4) **nominal size** The basic size of a hole or shaft to which the limit gauge is applied.
- (5) **limit of maximum permissible gauge wear** The limit of size under wear at which the gauge is permitted to serve as a limit gauge.
- (6) **permissible wear** The difference between the size to be shifted into the tolerance of a hole or shaft from the maximum material limit of the hole or shaft by taking wear of the limit gauge into account and the limit of maximum permissible gauge wear.

- (7) **permissible wear within hole tolerance** The portion of permissible wear that lies within the tolerance of the hole.
- (8) **permissible wear within shaft tolerance** The portion of permissible wear that lies within the tolerance of the shaft.
- (9) **working size of gap gauge** The size of the reference disk or combination of reference disk and gauge block located horizontally over which the gap gauge just passes in a vertical direction under the working load of gap gauge i.e. the load marked on the gap gauge (its own weight if not marked).

2.2 **Symbols** The symbols used in this Standard are shown in Table 1.

**Table 1 Symbols**

Symbol	Description
$T$	Tolerance on hole or shaft
MML	Maximum material limit. Namely maximum permissible size for a shaft and minimum permissible size for a hole
LML	Minimum material limit. Namely minimum permissible size for a shaft and maximum permissible size for a hole
$H$	Tolerance of plug gauge
$H_s$	Tolerance of rod gauge
$H_i$	Tolerance of ring gauge and gap gauge
$H_p$	Tolerance of reference disk
$y$	Absolute value of difference between MML of hole and the limit of maximum permissible gauge wear of GO limit gauge
$y_1$	Absolute value of difference between MML of shaft and the limit of maximum permissible gauge wear of GO limit gauge
$y'$	Absolute value of difference between MML of hole and the limit of maximum permissible gauge wear, in which measuring uncertainties are taken into account, of GO limit gauge $y' =  y - \alpha $
$y'_1$	Absolute value of difference between MML of shaft and the limit of maximum permissible gauge wear, in which measuring uncertainties are taken into account, of GO limit gauge $y'_1 =  y_1 - \alpha_1 $
$z$	Permissible wears within hole tolerance of limit gauge for hole
$z_1$	Permissible wears within shaft tolerance of limit gauge for shaft
$\alpha$	Safety zone provided for compensating measuring uncertainties of limit gauges for holes of nominal size over 180 mm
$\alpha_1$	Safety zone provided for compensating measuring uncertainties of limit gauges for shafts of nominal size over 180 mm

3 **Types of limit gauges and selection thereof** The representative types of limit gauges and selection thereof for nominal sizes are shown in Tables 2 and 3.

The length of GO gauge portion of full form cylindrical plug gauges, segmental cylindrical bar gauges and ring gauges shall be equal to the length of hole, shaft or fit to be inspected. NOT GO gauge shall be shorter than the GO gauge or the area of gauge portion shall be made smaller.

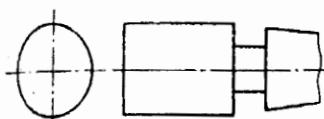
If it is ensured that the form deviation of the hole and shaft does not affect the fit, such a case is an exception.

The GO gauge and NOT GO gauge shall be identified by the length or shape of gauge portion, and NOT GO gauge may be marked with a red mark or may have a groove representing NOT GO gauge.

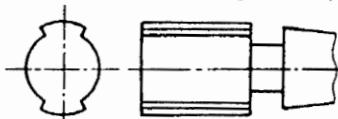
The spherical radius of gauge portion in a rod gauge shall not exceed 50 % of the nominal size.

**Table 2** Type of limit gauges for hole and selection thereof

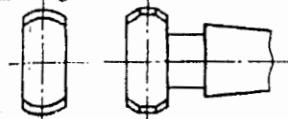
Full form cylindrical plug gauge



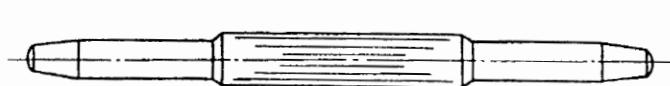
Segmental cylindrical bar gauge



Segmental cylindrical bar gauge with reduced measuring faces



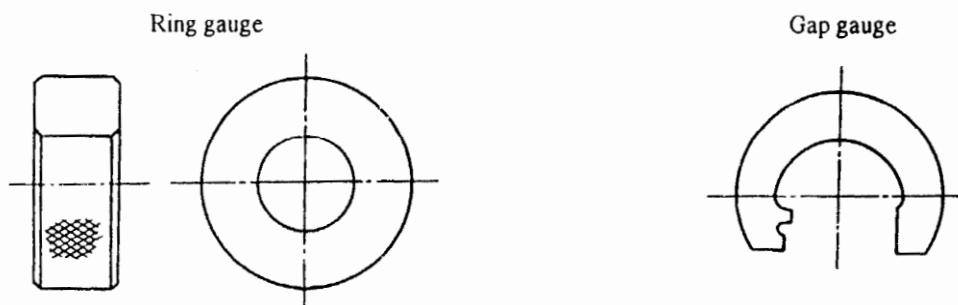
Rod gauge



Workpiece to be inspected	Classification of limit gauge	Order of preference	Range of applicable nominal size (mm)				
			0	6	10	120	315
Rigid parts	GO gauge	1	Full form cylindrical plug gauge			Segmental cylindrical bar gauge	Rod gauge
		2			Segmental cylindrical bar gauge		
	NOT GO gauge	1	Full form cylindrical plug gauge		Segmental cylindrical bar gauge with reduced measuring faces	Rod gauge	
		2			Rod gauge		
		3			Full form cylindrical plug gauge		
Non-rigid parts	GO gauge	1	Full form cylindrical plug gauge		Segmental cylindrical bar gauge with reduced measuring faces	Rod gauge	
		2			Full form cylindrical plug gauge		
	NOT GO gauge	1	Full form cylindrical plug gauge		Segmental cylindrical bar gauge with reduced measuring faces	Rod gauge	
		2			Full form cylindrical plug gauge		

Remarks: The figures show the shapes of functional parts, and do not show the standard of shapes of other parts.

**Table 3** Types of limit gauges for shaft and selection thereof



Workpiece to be in- spected	Classi- fication of limit gauge	Order of pref- erence	Range of applicable nominal size (mm)				
			0	6	10	120	315
Rigid parts	GO gauge	1		Ring gauge			
		2		Gap gauge			
	NOT GO gauge	1		Gap gauge			
		2		Ring gauge			
Non-rigid parts	GO gauge	1		Ring gauge			
	NOT GO gauge	1		Ring gauge			

Remarks: The figures show the shapes of functional parts, and do not show the standard of shapes of other parts.

**4 Correlation between gauge tolerance and form tolerance of limit gauges and reference disks and grades of hole and shaft tolerances** The gauge tolerance and form tolerance of limit gauges and reference disks are as shown in Table 4 corresponding to the grades of hole and shaft tolerances applied.

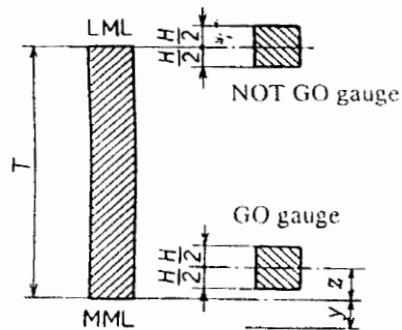
**Table 4** Correlation between gauge tolerance and form tolerance of limit gauges and reference disks and grades of hole and shaft tolerances

Type	Classification	Grade of hole and shaft tolerances				
		IT6	IT7	IT8 to IT10	IT11 + IT12	IT13 to IT16
Full form cylindrical plug gauge Segmental cylindrical bar gauge Segmental cylindrical bar gauge with reduced measuring faces	Gauge tolerance $H$	IT2	IT3	IT3	IT5	IT7
	Circularity-Cylindricity	IT1	IT2	IT2	IT4	IT5
Rod gauge	Gauge tolerance $H_s$	IT2	IT2	IT2	IT4	IT6
Ring gauge	Gauge tolerance $H_t$	IT3	IT3	IT4	IT5	IT7
	Circularity-Cylindricity	IT2	IT2	IT3	IT4	IT5
Gap gauge	Gauge tolerance $H_1$	IT3	IT3	IT4	IT5	IT7
	Parallelism-Flatness	IT2	IT2	IT3	IT4	IT5
Reference disk	Gauge tolerance $H_p$	IT1	IT1	IT2	IT2	IT3
	Circularity-Cylindricity	IT1	IT1	IT1	IT1	IT2

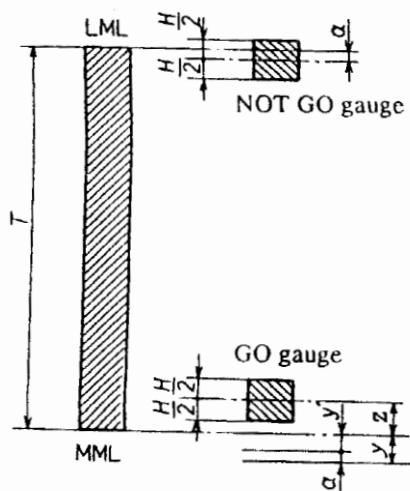
**5 Correlation between tolerance zone of limit gauge and reference disk and hole and shaft tolerances** The correlation between tolerance zone of limit gauge and reference disk and hole and shaft tolerances differs for gauges and disks used for holes and shafts of IT6 to IT8 from those used for holes and shafts of IT9 to IT16. Even if they are used for the same grade the correlation is different for nominal size not exceeding 180 mm and for nominal size exceeding 180 mm. The correlation is given in Figs. 1 and 2.

IT6 to IT8

Workpiece not exceeding 180 mm

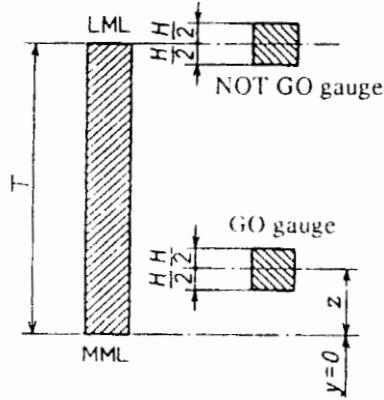


Workpiece exceeding 180 mm

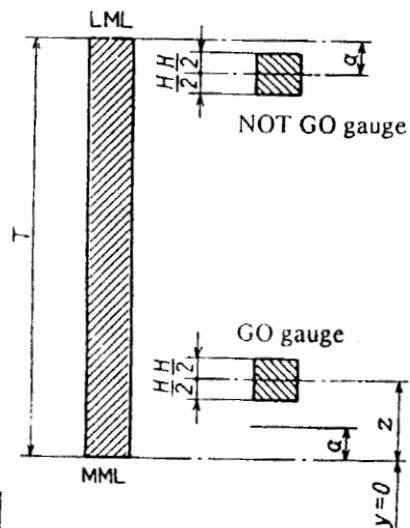


IT9 to IT16

Workpiece not exceeding 180 mm



Workpiece exceeding 180 mm



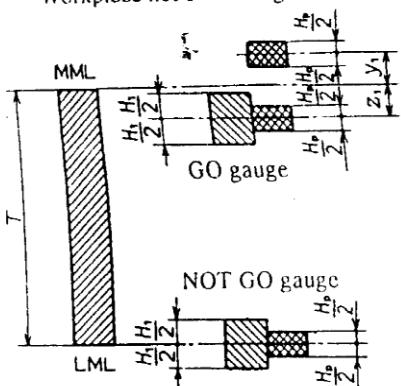
Tolerance of hole      Tolerance of gauge

Remarks: For rod gauge,  $H$  in the figure is replaced by  $H_s$ .

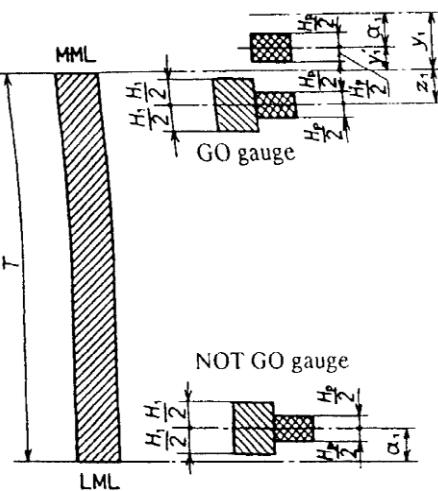
**Fig. 1** Correlation between tolerance zone of limit gauge for hole and tolerance of hole

## IT6 to IT8

Workpiece not exceeding 180 mm

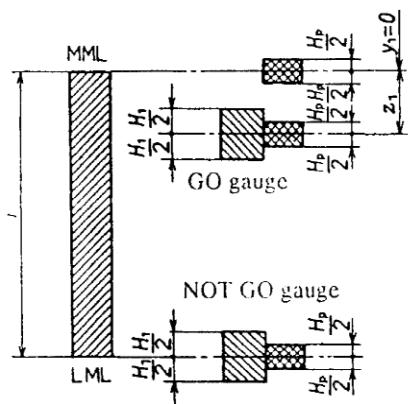


Workpiece exceeding 180 mm

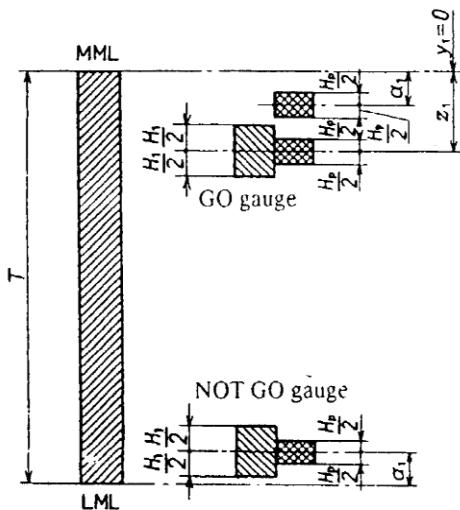


## IT9 to IT16

Workpiece not exceeding 180 mm



Workpiece exceeding 180 mm



Tolerance  
of shaft

Tolerance  
of gauge

Tolerances  
of reference disk

**Fig. 2** Correlation between tolerance zone of limit gauge for shaft and reference disk and tolerance of shaft

**6 Size of limit gauge and reference disk** The formulae by which sizes of limit gauges and reference disks are obtained shall be as stated in Table 5, and parameters for obtaining the size shall be as stated in Attached Tables 2 to 12. When the dimension has five or more decimal places, it shall be rounded off to four places of decimals in accordance with **JIS Z 8401**. The calculation results are shown in Attached Tables 13 to 23.

**Table 5** Calculation formulae for obtaining dimensions of limit gauge and reference disk

Classification			Classification by nominal size	
			Not more than 180 mm	Over 180 mm
Limit gauge for hole	GO gauge	Maximum permissible size	$MML + \frac{H}{2} + z^{\prime\prime}$	
		Minimum permissible size	$MML - \frac{H}{2} + z^{\prime\prime}$	
	NOT GO gauge	Maximum permissible size	$LML + \frac{H}{2}^{\prime\prime}$	$LML + \frac{H}{2} - \alpha^{\prime\prime}$
		Minimum permissible size	$LML - \frac{H}{2}^{\prime\prime}$	$LML - \frac{H}{2} - \alpha^{\prime\prime}$
Limit gauge for shaft	GO gauge	Maximum permissible size	$MML + \frac{H_1}{2} - z_1$	
		Minimum permissible size	$MML - \frac{H_1}{2} - z_1$	
	NOT GO gauge	Maximum permissible size	$LML + \frac{H_1}{2}$	$LML + \frac{H_1}{2} + \alpha_1$
		Minimum permissible size	$LML - \frac{H_1}{2}$	$LML - \frac{H_1}{2} + \alpha_1$
Reference disk	For GO gauge Inspection at new manufac- ture	Maximum permissible size	$MML + \frac{H_p}{2} - z_1$	
		Minimum permissible size	$MML - \frac{H_p}{2} - z_1$	
	For GO gauge Wear inspection	Maximum permissible size	$MML + \frac{H_p}{2} + y_1$	$MML + \frac{H_p}{2} + y_1 - \alpha_1$
		Minimum permissible size	$MML - \frac{H_p}{2} + y_1$	$MML - \frac{H_p}{2} + y_1 - \alpha_1$
	For NOT GO gauge	Maximum permissible size	$LML + \frac{H_p}{2}$	$LML + \frac{H_p}{2} + \alpha_1$
		Minimum permissible size	$LML - \frac{H_p}{2}$	$LML - \frac{H_p}{2} + \alpha_1$

Note <sup>(1)</sup> For rod gauges, calculation shall be made with  $H$  being replaced by  $H_s$ .

**7 Surface roughness of gauging surface** The surface roughness of gauging surface shall not exceed 10 % of the tolerance of the gauge and shall be 0.2  $\mu mR_s$  at the maximum.

**8 Materials and hardness** The material for gauge portion shall be alloy tool steel SKS3 specified in JIS G 4404 or that at least equivalent in mechanical properties. However, material for gap gauges shall be carbon tool steel SK4 specified in JIS G 4401 or that at least equivalent in mechanical properties.

The hardness of gauging surface shall be at least 700 HV (at least 60 HRC), and the surface shall be subjected to adequate dimensional stabilizing treatment.

**9 Inspection** The inspection of limit gauges shall be carried out for the size, shape, surface roughness, material and hardness, and the results shall comply with the provisions of 3 to 8.

The measuring method of dimensions of gauge portion is shown in Attached Table 24. If the measurement can be done with an accuracy at least equivalent thereto, such a case is an exception.

**10 Standard temperature** The numerical values of various sizes stated in this Standard are those at 20 °C.

## **11 Purpose and procedures for use of limit gauges**

### **11.1 Limit gauges for holes**

**11.1.1 GO plug gauge** This is a gauge to inspect whether the diameter of hole is larger than the specified MML or not, and this shall pass through the overall length of hole without any difficulty.

**11.1.2 NOT GO plug gauge** This is a gauge to inspect whether the diameter of hole is smaller than the specified LML or not, and this shall not enter into the hole.

**11.1.3 GO rod gauge** This is a gauge to inspect whether the diameter of hole is larger than the specified MML or not, and this shall pass through the diameter of hole without any difficulty.

**11.1.4 NOT GO rod gauge** This is a gauge to inspect whether the diameter of hole is smaller than the specified LML or not, and this shall not enter into the diameter of hole without under force being applied.

### **11.2 Limit gauges for shafts**

**11.2.1 GO ring gauge** This is a gauge to inspect whether the diameter of shaft is smaller than the specified MML or not, and this shall pass through overall length of the shaft.

**11.2.2 NOT GO ring gauge** This is a gauge to inspect whether the diameter of shaft is larger than the specified LML or not, and this shall not enter into the shaft.

**11.2.3 GO gap gauge** This is a gauge to inspect whether the diameter of shaft is smaller than the specified MML or not, and operated in such a manner that one opening end of gauging surface is applied to the shaft as the fulcrum and the gauge is turned slowly so that another gauging surface bites the point opposite of the fulcrum (measuring point). The inspection shall be carried out at least in two directions perpendicular each other and in the axial direction at positions adequate to the length not less than three, and the gauge shall pass at all the measuring points at the working load without any difficulty.

**11.2.4 NOT GO gap gauge** This is a gauge to inspect whether the diameter of shaft is larger than the specified LML or not, and the inspection shall be carried out at least in two directions perpendicular each other and in the axial direction at positions adequate to the length not less than three. The gauge shall not pass at all the positions when the working load is applied to the gauge.

**12 Decision of acceptance or rejection by means of limit gauges** The hole or shaft which has been accepted by the inspection by means of the limit gauges specified in this Standard, shall be considered within the limits of upper dimensional tolerance and lower dimensional tolerances specified in JIS B 0401.

**13 Treatment of disagreement in decision of acceptance or rejection by limit gauges in trade** When disagreement arises between the manufacturer and the user in the decision of acceptance or rejection by means of limit gauges due to difference of gauges used, the hole or shaft shall be treated as accepted ones if the limit gauges by which acceptance is decided satisfy the provisions of this Standard (permissible wear is taken into account).

**14 Designation of limit gauge** The limit gauge shall be designated by the number or title of Standard, kind of limit gauge, nominal size, numerical values indicating position of tolerance zone and grade, and identification of GO or NOT GO.

Example 1 JIS B 7420 full form cylindrical plug gauge 20H7 GO

Example 2 Plain limit gauge ring gauge 30h7 NOT GO

**15 Marking** The following items shall be marked on a suitable position of each limit gauge:

- (1) Nominal size
- (2) Numerical values indicating position of tolerance zone and grade
- (3) Letters of "GO" or "NOT GO", if necessary

Remarks: Symbols indicating these letters may be used.

Example: "→" (symbol denoting GO), "✗→" (symbol denoting NOT GO), etc.

- (4) For gap gauge, working load, if necessary
- (5) Year and month of manufacture, their abbreviation, or production number
- (6) Manufacturer's name or abbreviation

**Attached Table 1** Normative references

Standard number	Title of standard	Standard number	Title of standard
JIS B 0023	Technical drawings-Geometrical tolerancing-Maximum material requirement and least material requirement	JIS B 7535	Flow type air gauges
JIS B 0401	System of limits and fits	JIS B 7536	Electrical comparators
JIS B 0621	Definitions and designations of geometrical deviations	JIS G 4401	Carbon tool steels
JIS B 7451	Roundness measuring machines	JIS G 4404	Alloy tool steels
JIS B 7506	Gauge blocks	JIS Z 8103	Glossary of terms used in instrumentation
JIS B 7519	Microindicators	JIS Z 8401	Rules for rounding off of numerical values

**Attached Table 2** Parameters for obtaining tolerances and sizes of limit gauges and reference disks for IT 6

Nominal size (mm)		T	Limit gauge for hole										Limit gauge for shaft					Unit: μm		
			Plug gauge					Rod gauge					Ring gauge, gap gauge, reference disk							
Over	Up to and incl.		IT 6	z	y	y'	α	H <sub>IT 2</sub>	z	y	y'	α	H <sub>s IT 2</sub>	z <sub>1</sub>	y <sub>1</sub>	y' <sub>1</sub>	α <sub>1</sub>	H <sub>1 IT 3</sub>	H <sub>p IT 1</sub>	
1 and over			3	6	1	1	—	—	1,2	—	—	—	—	1,5	1,5	—	—	2	0,8	
	3	6	8	1,5	1	—	—	—	1,5	—	—	—	—	2	1,5	—	—	2,5	1	
	6	10	9	1,5	1	—	—	—	1,5	1,5	1	—	—	1,5	2	1,5	—	—	2,5	
	10	18	11	2	1,5	—	—	2	2	1,5	—	—	—	2	2,5	2	—	3	1,2	
	18	30	13	2	1,5	—	—	—	2,5	2	1,5	—	—	2,5	3	3	—	4	1,5	
	30	50	16	2,5	2	—	—	—	2,5	2,5	2	—	—	2,5	3,5	3	—	4	1,5	
	50	80	19	2,5	2	—	—	—	3	2,5	2	—	—	3	4	3	—	5	2	
	80	120	22	3	3	—	—	4	3	3	—	—	4	5	4	—	—	6	2,5	
	120	180	25	4	3	—	—	—	5	4	3	—	—	5	6	4	—	—	8	3,5
	180	250	29	5	4	2	2	7	5	4	2	2	7	7	5	3	2	10	4,5	
	250	315	32	6	5	2	3	8	6	5	2	3	8	8	6	3	3	12	6	
	315	400	36	7	6	2	4	9	7	6	2	4	9	—	—	—	—	—	7	
	400	500	40	8	7	2	5	10	8	7	2	5	10	—	—	—	—	—	8	

**Attached Table 3** Parameters for obtaining tolerances and sizes of limit gauges and reference disks for IT 7

Nominal size (mm)		T	Limit gauge for hole										Limit gauge for shaft					Unit: μm	
			Plug gauge					Rod gauge					Ring gauge, gap gauge, reference disk						
Over	Up to and incl.		IT 7	z	y	y'	α	H <sub>IT 3</sub>	z	y	y'	α	H <sub>s IT 2</sub>	z <sub>1</sub>	y <sub>1</sub>	y' <sub>1</sub>	α <sub>1</sub>	H <sub>1 IT 3</sub>	H <sub>p IT 1</sub>
1 and over			3	10	1,5	1,5	—	—	2	—	—	—	—	1,5	1,5	—	—	2	0,8
	3	6	12	2	1,5	—	—	—	2,5	—	—	—	—	2	1,5	—	—	2,5	1
	6	10	15	2	1,5	—	—	—	2,5	2	1,5	—	—	1,5	2	1,5	—	—	2,5
	10	18	18	2,5	2	—	—	—	3	2,5	2	—	—	2	2,5	2	—	3	1,2
	18	30	21	3	3	—	—	—	4	3	3	—	—	2,5	3	3	—	4	1,5
	30	50	25	3,5	3	—	—	—	4	3,5	3	—	—	2,5	3,5	3	—	4	1,5
	50	80	30	4	3	—	—	—	5	4	3	—	—	3	4	3	—	5	2
	80	120	35	5	4	—	—	—	6	5	4	—	—	4	5	4	—	6	2,5
	120	180	40	6	4	—	—	8	6	4	—	—	5	6	4	—	—	8	3,5
	180	250	46	7	6	3	3	10	7	6	3	3	7	7	6	3	3	10	4,5
	250	315	52	8	7	3	4	12	8	7	3	4	8	8	7	3	4	12	6
	315	400	57	10	8	2	6	13	10	8	2	6	9	—	—	—	—	—	7
	400	500	63	11	9	2	7	15	11	9	2	7	10	—	—	—	—	—	8

**Attached Table 4** Parameters for obtaining tolerances and sizes of limit gauges and reference disks for IT 8

Nominal size (mm)		T IT 8	Limit gauge for hole										Limit gauge for shaft							Unit: $\mu\text{m}$	
Over	Up to and incl.		Plug gauge					Rod gauge					Ring gauge, gap gauge, reference disk					$H_i$ IT 4	$H_p$ IT 2		
			$z$	$y$	$y'$	$\alpha$	$H$ IT 3	$z$	$y$	$y'$	$\alpha$	$H_s$ IT 2	$z_1$	$y_1$	$y'_1$	$\alpha_1$					
1 and over	3	14	2	3	—	—	2	—	—	—	—	—	2	3	—	—	3	1,2			
	3	18	3	3	—	—	2,5	—	—	—	—	—	3	3	—	—	4	1,5			
	6	10	22	3	3	—	—	2,5	3	3	—	—	3	3	—	—	4	1,5			
	10	18	27	4	4	—	—	3	4	4	—	—	2	4	4	—	—	5	2		
	18	30	33	5	4	—	—	4	5	4	—	—	2,5	5	4	—	—	6	2,5		
	30	50	39	6	5	—	—	4	6	5	—	—	2,5	6	5	—	—	7	2,5		
	50	80	46	7	5	—	—	5	7	5	—	—	3	7	5	—	—	8	3		
	80	120	54	8	6	—	—	6	8	6	—	—	4	8	6	—	—	10	4		
	120	180	63	9	6	—	—	8	9	6	—	—	5	9	6	—	—	12	5		
	180	250	72	12	7	3	4	10	12	7	3	4	7	12	7	3	4	14	7		
	250	315	81	14	9	3	6	12	14	9	3	6	8	14	9	3	6	16	8		
	315	400	89	16	9	2	7	13	16	9	2	7	9	—	—	—	—	—	—		
	400	500	97	18	11	2	9	15	18	11	2	9	10	—	—	—	—	—	—		

**Attached Table 5** Parameters for obtaining tolerances and sizes of limit gauges and reference disks for IT 9

Nominal size (mm)		T IT 9	Limit gauge for hole										Limit gauge for shaft							Unit: $\mu\text{m}$	
Over	Up to and incl.		Plug gauge					Rod gauge					Ring gauge, gap gauge, reference disk					$H_i$ IT 4	$H_p$ IT 2		
			$z$	$y$	$y'$	$\alpha$	$H$ IT 3	$z$	$y$	$y'$	$\alpha$	$H_s$ IT 2	$z_1$	$y_1$	$y'_1$	$\alpha_1$					
1 and over	3	25	5	0	—	—	2	—	—	—	—	—	5	0	—	—	3	1,2			
	3	30	6	0	—	—	2,5	—	—	—	—	—	6	0	—	—	4	1,5			
	6	10	36	7	0	—	—	2,5	7	0	—	—	1,5	7	0	—	—	4	1,5		
	10	18	43	8	0	—	—	3	8	0	—	—	2	8	0	—	—	5	2		
	18	30	52	9	0	—	—	4	9	0	—	—	2,5	9	0	—	—	6	2,5		
	30	50	62	11	0	—	—	4	11	0	—	—	2,5	11	0	—	—	7	2,5		
	50	80	74	13	0	—	—	5	13	0	—	—	3	13	0	—	—	8	3		
	80	120	87	15	0	—	—	6	15	0	—	—	4	15	0	—	—	10	4		
	120	180	100	18	0	—	—	8	18	0	—	—	5	18	0	—	—	12	5		
	180	250	115	21	0	4	4	10	21	0	4	4	7	21	0	4	4	14	7		
	250	315	130	24	0	6	6	12	24	0	6	6	8	24	0	6	6	16	8		
	315	400	140	28	0	7	7	13	28	0	7	7	9	—	—	—	—	—	—		
	400	500	155	32	0	9	9	15	32	0	9	9	10	—	—	—	—	—	—		

**Attached Table 6** Parameters for obtaining tolerances and sizes of limit gauges and reference disks for IT 10

Nominal size (mm)		T	Limit gauge for hole									Limit gauge for shaft						Unit: $\mu\text{m}$	
			Plug gauge					Rod gauge				Ring gauge, gap gauge, reference disk					$H_1$ IT 4	$H_p$ IT 2	
Over	Up to and incl.	IT 10	$z$	$y$	$y'$	$\alpha$	$H$ IT 3	$z$	$y$	$y'$	$\alpha$	$H_s$ IT 2	$z_1$	$y_1$	$y'_1$	$\alpha_1$	$H_1$ IT 4	$H_p$ IT 2	
1 and over	3	40	5	0	—	—	2	—	—	—	—	—	5	0	—	—	3	1.2	
	3	6	48	6	0	—	—	2.5	—	—	—	—	6	0	—	—	4	1.5	
	6	10	58	7	0	—	—	2.5	7	0	—	—	1.5	7	0	—	—	4	1.5
	10	18	70	8	0	—	—	3	8	0	—	—	2	8	0	—	—	5	2
	18	30	84	9	0	—	—	4	9	0	—	—	2.5	9	0	—	—	6	2.5
	30	50	100	11	0	—	—	4	11	0	—	—	2.5	11	0	—	—	7	2.5
	50	80	120	13	0	—	—	5	13	0	—	—	3	13	0	—	—	8	3
	80	120	140	15	0	—	—	6	15	0	—	—	4	15	0	—	—	10	4
	120	180	160	18	0	—	—	8	18	0	—	—	5	18	0	—	—	12	5
	180	250	185	24	0	7	7	10	24	0	7	7	7	24	0	7	7	14	7
	250	315	210	27	0	9	9	12	27	0	9	9	8	27	0	9	9	16	8
	315	400	230	32	0	11	11	13	32	0	11	11	9	—	—	—	—	—	—
	400	500	250	37	0	14	14	15	37	0	14	14	10	—	—	—	—	—	—

**Attached Table 7** Parameters for obtaining tolerances and sizes of limit gauges and reference disks for IT 11

Nominal size (mm)		T	Limit gauge for hole									Limit gauge for shaft						Unit: $\mu\text{m}$	
			Plug gauge					Rod gauge				Ring gauge, gap gauge, reference disk					$H_1$ IT 5	$H_p$ IT 2	
Over	Up to and incl.	IT 11	$z$	$y$	$y'$	$\alpha$	$H$ IT 5	$z$	$y$	$y'$	$\alpha$	$H_s$ IT 4	$z_1$	$y_1$	$y'_1$	$\alpha_1$	$H_1$ IT 5	$H_p$ IT 2	
1 and over	3	60	10	0	—	—	4	—	—	—	—	—	10	0	—	—	4	1.2	
	3	6	75	12	0	—	—	5	—	—	—	—	12	0	—	—	5	1.5	
	6	10	90	14	0	—	—	6	14	0	—	—	4	14	0	—	—	6	1.5
	10	18	110	16	0	—	—	8	16	0	—	—	5	16	0	—	—	8	2
	18	30	130	19	0	—	—	9	19	0	—	—	6	19	0	—	—	9	2.5
	30	50	160	22	0	—	—	11	22	0	—	—	7	22	0	—	—	11	2.5
	50	80	190	25	0	—	—	13	25	0	—	—	8	25	0	—	—	13	3
	80	120	220	28	0	—	—	15	28	0	—	—	10	28	0	—	—	15	4
	120	180	250	32	0	—	—	18	32	0	—	—	12	32	0	—	—	18	5
	180	250	290	40	0	10	10	20	40	0	10	10	14	40	0	10	10	20	7
	250	315	320	45	0	15	15	23	45	0	15	15	16	45	0	15	15	23	8
	315	400	360	50	0	15	15	25	50	0	15	15	18	—	—	—	—	—	—
	400	500	400	55	0	20	20	27	55	0	20	20	20	—	—	—	—	—	—

**Attached Table 8** Parameters for obtaining tolerances and sizes of limit gauges and reference disks for IT 12

Nominal size (mm)		<i>T</i>	Limit gauge for hole										Limit gauge for shaft							Unit: $\mu\text{m}$	
			Plug gauge					Rod gauge					Ring gauge, gap gauge, reference disk					$H_1$ IT 5	$H_p$ IT 2		
Over	Up to and incl.		IT 12	<i>z</i>	<i>y</i>	<i>y'</i>	$\alpha$	$H$ IT 5	<i>z</i>	<i>y</i>	<i>y'</i>	$\alpha$	$H_s$ IT 4	<i>z</i> <sub>1</sub>	<i>y</i> <sub>1</sub>	<i>y'</i> <sub>1</sub>	$\alpha$ <sub>1</sub>				
1 and over	3	100	10	0	—	—	—	4	—	—	—	—	—	10	0	—	—	4	1,2		
	3	120	12	0	—	—	—	5	—	—	—	—	—	12	0	—	—	5	1,5		
	6	150	14	0	—	—	—	6	14	0	—	—	—	14	0	—	—	6	1,5		
	10	180	16	0	—	—	—	8	16	0	—	—	—	16	0	—	—	8	2		
	18	210	19	0	—	—	—	9	19	0	—	—	—	19	0	—	—	9	2,5		
	30	250	22	0	—	—	—	11	22	0	—	—	—	22	0	—	—	11	2,5		
	50	300	25	0	—	—	—	13	25	0	—	—	—	25	0	—	—	13	3		
	80	350	28	0	—	—	—	15	28	0	—	—	—	28	0	—	—	15	4		
	120	400	32	0	—	—	—	18	32	0	—	—	—	32	0	—	—	18	5		
	180	250	45	0	15	15	20	45	0	15	15	14	45	0	15	15	20	7			
	250	315	520	50	0	20	20	23	50	0	20	20	16	50	0	20	20	23	8		
	315	400	570	65	0	30	30	25	65	0	30	30	18	—	—	—	—	—			
	400	500	630	70	0	35	35	27	70	0	35	35	20	—	—	—	—	—			

**Attached Table 9** Parameters for obtaining tolerances and sizes of limit gauges and reference disks for IT 13

Nominal size (mm)		<i>T</i>	Limit gauge for hole										Limit gauge for shaft							Unit: $\mu\text{m}$	
			Plug gauge					Rod gauge					Ring gauge, gap gauge, reference disk					$H_1$ IT 7	$H_p$ IT 3		
Over	Up to and incl.		IT 13	<i>z</i>	<i>y</i>	<i>y'</i>	$\alpha$	$H$ IT 7	<i>z</i>	<i>y</i>	<i>y'</i>	$\alpha$	$H_s$ IT 6	<i>z</i> <sub>1</sub>	<i>y</i> <sub>1</sub>	<i>y'</i> <sub>1</sub>	$\alpha$ <sub>1</sub>				
1 and over	3	140	20	0	—	—	—	10	—	—	—	—	—	20	0	—	—	10	2		
	3	180	24	0	—	—	—	12	—	—	—	—	—	24	0	—	—	12	2,5		
	6	220	28	0	—	—	—	15	28	0	—	—	—	28	0	—	—	15	2,5		
	10	270	32	0	—	—	—	18	32	0	—	—	—	32	0	—	—	18	3		
	18	330	36	0	—	—	—	21	36	0	—	—	—	36	0	—	—	21	4		
	30	390	42	0	—	—	—	25	42	0	—	—	—	42	0	—	—	25	4		
	50	460	48	0	—	—	—	30	48	0	—	—	—	48	0	—	—	30	5		
	80	540	54	0	—	—	—	35	54	0	—	—	—	54	0	—	—	35	6		
	120	630	60	0	—	—	—	40	60	0	—	—	—	60	0	—	—	40	8		
	180	720	80	0	25	25	46	80	0	25	25	29	80	0	25	25	46	10			
	250	810	90	0	35	35	52	90	0	35	35	32	90	0	35	35	52	12			
	315	890	100	0	45	45	57	100	0	45	45	36	—	—	—	—	—	—			
	400	970	110	0	55	55	63	110	0	55	55	40	—	—	—	—	—	—			

**Attached Table 10** Parameters for obtaining tolerances and sizes of limit gauges and reference disks for IT 14

Nominal size (mm)		T	Limit gauge for hole									Limit gauge for shaft						Unit: μm	
			Plug gauge				Rod gauge					Ring gauge, gap gauge, reference disk							
Over	Up to and incl.	IT 14 ( <sup>2</sup> )	z	y	y'	α	H <sub>IT 7</sub>	z	y	y'	α	H <sub>s IT 6</sub>	z <sub>1</sub>	y <sub>1</sub>	y' <sub>1</sub>	α <sub>1</sub>	H <sub>t IT 7</sub>	H <sub>p IT 3</sub>	
1 and over	3	250	20	0	—	—	10	—	—	—	—	—	20	0	—	—	10	2	
3	6	300	24	0	—	—	12	—	—	—	—	—	24	0	—	—	12	2.5	
6	10	360	28	0	—	—	15	28	0	—	—	9	28	0	—	—	15	2.5	
10	18	430	32	0	—	—	18	32	0	—	—	11	32	0	—	—	18	3	
18	30	520	36	0	—	—	21	36	0	—	—	13	36	0	—	—	21	4	
30	50	620	42	0	—	—	25	42	0	—	—	16	42	0	—	—	25	4	
50	80	740	48	0	—	—	30	48	0	—	—	19	48	0	—	—	30	5	
80	120	870	54	0	—	—	35	54	0	—	—	22	54	0	—	—	35	6	
120	180	1 000	60	0	—	—	40	60	0	—	—	25	60	0	—	—	40	8	
180	250	1 150	100	0	45	45	46	100	0	45	45	29	100	0	45	45	46	10	
250	315	1 300	110	0	55	55	52	110	0	55	55	32	110	0	55	55	52	12	
315	400	1 400	125	0	70	70	57	125	0	70	70	36	—	—	—	—	—	—	
400	500	1 550	145	0	90	90	63	145	0	90	90	40	—	—	—	—	—	—	

Note (<sup>2</sup>) Tolerance grade IT 14 is not applicable to nominal size 1 mm.

**Attached Table 11** Parameters for obtaining tolerances and sizes of limit gauges and reference disks for IT 15

Nominal size (mm)		T	Limit gauge for hole									Limit gauge for shaft						Unit: μm	
			Plug gauge				Rod gauge					Ring gauge, gap gauge, reference disk							
Over	Up to and incl.	IT 15 ( <sup>3</sup> )	z	y	y'	α	H <sub>IT 7</sub>	z	y	y'	α	H <sub>s IT 6</sub>	z <sub>1</sub>	y <sub>1</sub>	y' <sub>1</sub>	α <sub>1</sub>	H <sub>t IT 7</sub>	H <sub>p IT 3</sub>	
1 and over	3	400	40	0	—	—	10	—	—	—	—	—	40	0	—	—	10	2	
3	6	480	48	0	—	—	12	—	—	—	—	—	48	0	—	—	12	2.5	
6	10	580	56	0	—	—	15	56	0	—	—	9	56	0	—	—	15	2.5	
10	18	700	64	0	—	—	18	64	0	—	—	11	64	0	—	—	18	3	
18	30	840	72	0	—	—	21	72	0	—	—	13	72	0	—	—	21	4	
30	50	1 000	80	0	—	—	25	80	0	—	—	16	80	0	—	—	25	4	
50	80	1 200	90	0	—	—	30	90	0	—	—	19	90	0	—	—	30	5	
80	120	1 400	100	0	—	—	35	100	0	—	—	22	100	0	—	—	35	6	
120	180	1 600	110	0	—	—	40	110	0	—	—	25	110	0	—	—	40	8	
180	250	1 850	170	0	70	70	46	170	0	70	70	29	170	0	70	70	46	10	
250	315	2 100	190	0	90	90	52	190	0	90	90	32	190	0	90	90	52	12	
315	400	2 300	210	0	110	110	57	210	0	110	110	36	—	—	—	—	—	—	
400	500	2 500	240	0	140	140	63	240	0	140	140	40	—	—	—	—	—	—	

Note (<sup>3</sup>) Tolerance grade IT 15 is not applicable to nominal size 1 mm.

**Attached Table 12** Parameters for obtaining tolerances and sizes of limit gauges and reference disks for IT 16

Unit:  $\mu\text{m}$

Nominal size (mm)	$T$	Limit gauge for hole										Limit gauge for shaft							
		Plug gauge					Rod gauge					Ring gauge, gap gauge, reference disk							
		Over	Up to and incl.	IT 16 ( <sup>4</sup> )	$z$	$y$	$y'$	$\alpha$	$H$ IT 7	$z$	$y$	$y'$	$\alpha$	$H_s$ IT 6	$z_1$	$y_1$	$y'_1$	$\alpha_1$	$H_1$ IT 7
1 and over	3	600	40	0	—	—	—	10	—	—	—	—	—	40	0	—	—	10	2
3	6	750	48	0	—	—	—	12	—	—	—	—	—	48	0	—	—	12	2,5
6	10	900	56	0	—	—	—	15	56	0	—	—	9	56	0	—	—	15	2,5
10	18	1 100	64	0	—	—	—	18	64	0	—	—	11	64	0	—	—	18	3
18	30	1 300	72	0	—	—	—	21	72	0	—	—	13	72	0	—	—	21	4
30	50	1 600	80	0	—	—	—	25	80	0	—	—	16	80	0	—	—	25	4
50	80	1 900	90	0	—	—	—	30	90	0	—	—	19	90	0	—	—	30	5
80	120	2 200	100	0	—	—	—	35	100	0	—	—	22	100	0	—	—	35	6
120	180	2 500	110	0	—	—	—	40	110	0	—	—	25	110	0	—	—	40	8
180	250	2 900	210	0	110	110	46	210	0	110	110	29	210	0	110	110	46	10	
250	315	3 200	240	0	140	140	52	240	0	140	140	32	240	0	140	140	52	12	
315	400	3 600	280	0	180	180	57	280	0	180	180	36	—	—	—	—	—	—	
400	500	4 000	320	0	220	220	63	320	0	220	220	40	—	—	—	—	—	—	

Note (<sup>4</sup>) Tolerance grade IT 16 is not applicable to nominal size 1 mm.

Attached Table 13 Dimensional tolerances and form tolerances of limit gauges and reference disks for IT6

Unit: μm

Nominal size (mm)	Limit gauge for hole				Rod gauge				Ring gauge				Gap gauge				Reference disk			
	Plug gauge		NOT GO (")		GO (")		NOT GO (")		GO (")		NOT GO (")		GO (")		NOT GO (")		Check at new manufacture		Check for wear	
	GO (")	NOT GO (")	GO (")	NOT GO (")	GO (")	NOT GO (")	GO (")	NOT GO (")	GO (")	NOT GO (")	GO (")	NOT GO (")	GO (")	NOT GO (")	GO (")	NOT GO (")	Check for wear	Check for wear	Check for wear	Check for wear
Circularity • Cylindricity																				
1 and over	+ 1.6	+ 0.4	- 1.0	+ 0.6	- 0.6	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	+ 2.2	+ 0.8	- 1.0	+ 0.8	- 0.8	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	+ 2.2	+ 0.8	- 1.0	+ 0.8	- 0.8	1	+ 2.2	+ 0.8	- 1.0	+ 0.8	- 0.8	-	-	-	-	-	-	-	-	-
10	+ 2.2	+ 0.8	- 1.0	+ 1.0	- 1.0	1.2	+ 3.0	+ 1.0	- 1.5	+ 1.0	- 1.0	-	-	-	-	-	-	-	-	-
18	+ 3.0	+ 1.0	- 1.5	+ 1.0	- 1.0	1.2	+ 3.2	+ 0.8	- 1.5	+ 1.2	- 1.2	-	-	-	-	-	-	-	-	-
30	+ 3.2	+ 0.8	- 1.5	+ 1.2	- 1.2	1.5	+ 3.2	+ 0.8	- 1.5	+ 1.2	- 1.2	-	-	-	-	-	-	-	-	-
50	+ 3.8	+ 1.2	- 2.0	+ 1.2	- 1.2	1.5	+ 3.8	+ 1.2	- 2.0	+ 1.2	- 1.5	-	-	-	-	-	-	-	-	-
80	+ 4.0	+ 1.0	- 2.0	+ 1.5	- 1.5	2	+ 4.0	+ 1.0	- 2.0	+ 1.5	- 1.5	-	-	-	-	-	-	-	-	-
120	+ 5.0	+ 1.0	- 3.0	+ 2.0	- 2.0	2.5	+ 5.0	+ 1.0	- 3.0	+ 2.0	- 2.0	-	-	-	-	-	-	-	-	-
180	+ 6.5	+ 1.5	- 3.0	+ 2.5	- 2.5	3.5	+ 6.5	+ 1.5	- 3.0	+ 2.5	- 2.5	-	-	-	-	-	-	-	-	-
250	+ 8.5	+ 1.5	- 2.0	+ 1.5	- 1.5	4.5	+ 8.5	+ 1.5	- 2.0	+ 1.5	- 1.5	-	-	-	-	-	-	-	-	-
315	+ 10.0	+ 2.0	- 2.0	+ 1.0	- 1.0	7.0	+ 10.0	+ 2.0	- 2.0	+ 1.0	- 1.0	-	-	-	-	-	-	-	-	-
315	+ 11.5	+ 2.5	- 2.0	+ 0.5	- 0.5	8.5	+ 11.5	+ 2.5	- 2.0	+ 0.5	- 0.5	-	-	-	-	-	-	-	-	-
400	+ 13.0	+ 3.0	- 2.0	0	- 10.0	8	+ 13.0	+ 3.0	- 2.0	0	- 10.0	-	-	-	-	-	-	-	-	-

Notes (1) The dimensional tolerance in column GO shall be used corresponding to maximum material limit (MML) of hole or shaft.

(2) The dimensional tolerance in column NOT GO shall be used corresponding to least material limit (LML) of hole or shaft.

**Attached Table 14** Dimensional tolerances and form tolerances of limit gauges and reference disks for RT

Nominal size (mm)	Limit gauge for hole		Rod gauge		Ring gauge		Gap gauge		Reference disk	
	GO ( )	NOT GO ( )	GO ( )	NOT GO ( )	GO ( )	NOT GO ( )	Check at new manufacture	Tolerance	Check at new manufacture	Circularity + Cylindricity
Limit gauge for shaft										
1	+0.5	-1.5	+1.0	-1.0	+1.2	-	-0.5	-2.5	+1.5	-1.0
3	+3.2	+0.8	-1.5	+1.2	-1.2	-1.5	-0.8	-3.2	+1.5	-1.2
6	+3.2	+0.8	-1.5	+1.2	-1.2	-1.5	-0.8	-3.2	+1.5	-1.2
10	+4.0	+1.6	-2.0	+1.5	-1.5	-1.0	-1.0	-4.0	+2.0	-1.5
18	+5.0	+1.0	-3.0	+2.0	-2.0	-1.0	-1.0	-5.0	+3.0	-2.0
30	+5.5	+1.5	-3.0	+2.0	-2.0	-1.2	-1.5	-5.5	+3.0	-2.0
50	+6.5	+1.5	-3.0	+2.5	-2.5	-1.5	-1.5	-6.5	+3.0	-2.5
80	+8.0	+2.0	-4.0	+3.0	-3.0	-2.0	-2.0	-8.0	+4.0	-3.0
120	+10.0	+2.0	-4.0	+4.0	-4.0	-2.0	-2.0	-10.0	+4.0	-4.0
180	+12.0	+2.0	-3.0	+2.0	-2.0	-0.5	-0.5	-12.0	+3.0	-2.0
250	+14.0	+2.0	-3.0	+2.0	-2.0	0	0	-14.0	+3.0	-2.0
315	+16.5	+3.5	-2.0	+0.5	-12.5	9	+14.5	+5.5	-2.0	-10.5
400	+18.5	+3.5	-2.0	+0.5	-14.5	10	+16.0	+6.0	-2.0	-12.0
500	+20.0	+3.5	-2.0	+0.5	-14.5	10	+18.0	+7.0	-2.0	-14.0

Notes ( ) The dimensional tolerance in column CO shall be used corresponding to maximum material limit (MML) of hole or shaft.

(C) The dimensional tolerance in column NOT GO shall be used corresponding to least material limit (LML) of hole or shaft.

**Attached Table 15** Dimensional tolerances and form tolerances of limit gauges and reference disks for IT8

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Nominal size (mm)	Upper to and incl. Over	Limit gauge for hole		Rod gauge		Ring gauge		Gap gauge		Reference disk	
		Plug gauge GO (")	NOT GO (")	GO (")	NOT GO (")	GO (")	NOT GO (")	GO (")	NOT GO (")	Check for wear manufacture	Cylindricity + Cylindricality
<b>Upper dimensionality</b>											
1 and over	-	+ 3.0 + 1.0 - 3.0 - 1.0	+ 1.0 - 1.0 - 1.0	1.2 - 1.2 - 1.2	- 1.0 - 1.0 - 1.0	- 1.0 - 1.0 - 1.0	- 0.5 - 0.5 - 0.5	+ 1.5 + 3.0 + 3.0	- 1.5 - 3.5 - 3.5	+ 1.5 + 3.0 + 3.0	- 1.4 - 2.6 - 2.6
3	+ 4.2 + 1.8 - 3.0 + 1.2 - 1.0	+ 1.2 - 1.2 - 1.2	- 1.5 - 1.5 - 1.5	- 1.5 - 1.5 - 1.5	- 0.8 - 0.8 - 0.8	- 1.0 - 1.0 - 1.0	- 2.0 - 2.0 - 2.0	+ 2.0 + 3.0 + 3.0	- 1.0 - 2.0 - 2.0	+ 2.0 + 3.0 + 3.0	- 0.8 - 0.8 - 0.8
6	+ 4.2 + 1.8 - 3.0 + 1.2 - 1.0	+ 1.2 - 1.2 - 1.2	- 1.5 - 1.5 - 1.5	- 1.5 - 1.5 - 1.5	- 0.8 - 0.8 - 0.8	- 1.0 - 1.0 - 1.0	- 2.0 - 2.0 - 2.0	+ 2.0 + 3.0 + 3.0	- 1.0 - 2.0 - 2.0	+ 2.0 + 3.0 + 3.0	- 0.8 - 0.8 - 0.8
10	+ 4.2 + 1.8 - 3.0 + 1.2 - 1.0	+ 1.2 - 1.2 - 1.2	- 1.5 - 1.5 - 1.5	- 1.5 - 1.5 - 1.5	- 0.8 - 0.8 - 0.8	- 1.0 - 1.0 - 1.0	- 2.0 - 2.0 - 2.0	+ 2.0 + 3.0 + 3.0	- 1.0 - 2.0 - 2.0	+ 2.0 + 3.0 + 3.0	- 0.8 - 0.8 - 0.8
18	+ 5.5 + 2.5 - 4.0 + 1.5 - 1.0	+ 1.5 - 1.5 - 1.5	- 2.0 - 2.0 - 2.0	- 2.0 - 2.0 - 2.0	- 1.2 - 1.2 - 1.2	- 1.2 - 1.2 - 1.2	- 2.0 - 2.0 - 2.0	+ 2.0 + 3.0 + 3.0	- 2.0 - 3.0 - 3.0	+ 2.0 + 3.0 + 3.0	- 1.2 - 1.2 - 1.2
30	+ 8.0 + 4.0 - 5.0 + 2.0 - 1.0	+ 2.0 - 2.0 - 2.0	- 2.5 - 2.5 - 2.5	- 2.5 - 2.5 - 2.5	- 1.2 - 1.2 - 1.2	- 1.2 - 1.2 - 1.2	- 2.0 - 2.0 - 2.0	+ 2.0 + 3.0 + 3.0	- 2.0 - 3.0 - 3.0	+ 2.0 + 3.0 + 3.0	- 1.2 - 1.2 - 1.2
50	+ 9.5 + 4.5 - 5.0 + 2.5 - 1.0	+ 2.5 - 2.5 - 2.5	- 3.0 - 3.0 - 3.0	- 3.0 - 3.0 - 3.0	- 1.5 - 1.5 - 1.5	- 1.5 - 1.5 - 1.5	- 2.0 - 2.0 - 2.0	+ 2.0 + 3.0 + 3.0	- 2.0 - 3.0 - 3.0	+ 2.0 + 3.0 + 3.0	- 1.2 - 1.2 - 1.2
80	+ 11.0 + 5.0 - 6.0 + 3.0 - 1.0	+ 3.0 - 3.0 - 3.0	- 4.0 - 4.0 - 4.0	- 4.0 - 4.0 - 4.0	- 2.0 - 2.0 - 2.0	- 2.0 - 2.0 - 2.0	- 2.0 - 2.0 - 2.0	+ 2.0 + 3.0 + 3.0	- 2.0 - 3.0 - 3.0	+ 2.0 + 3.0 + 3.0	- 1.2 - 1.2 - 1.2
120	+ 13.0 + 5.0 - 6.0 + 4.0 - 1.0	+ 4.0 - 4.0 - 4.0	- 5.0 - 5.0 - 5.0	- 5.0 - 5.0 - 5.0	- 3.0 - 3.0 - 3.0	- 3.0 - 3.0 - 3.0	- 3.0 - 3.0 - 3.0	+ 3.0 + 4.0 + 4.0	- 3.0 - 4.0 - 4.0	+ 3.0 + 4.0 + 4.0	- 1.2 - 1.2 - 1.2
180	+ 17.0 + 7.0 - 3.0 + 1.0 - 1.0	+ 1.0 - 1.0 - 1.0	- 7.0 - 7.0 - 7.0	- 7.0 - 7.0 - 7.0	- 5.0 - 5.0 - 5.0	- 5.0 - 5.0 - 5.0	- 5.0 - 5.0 - 5.0	+ 5.0 + 6.0 + 6.0	- 5.0 - 6.0 - 6.0	+ 5.0 + 6.0 + 6.0	- 1.2 - 1.2 - 1.2
250	+ 20.0 + 8.0 - 3.0 - 3.0 - 3.0	- 0.0 - 0.0 - 0.0	- 12.0 - 12.0 - 12.0	- 12.0 - 12.0 - 12.0	- 8.0 - 8.0 - 8.0	- 8.0 - 8.0 - 8.0	- 8.0 - 8.0 - 8.0	+ 8.0 + 9.0 + 9.0	- 8.0 - 9.0 - 9.0	+ 8.0 + 9.0 + 9.0	- 1.2 - 1.2 - 1.2
315	+ 22.5 + 9.5 - 2.0 - 2.0 - 2.0	- 0.5 - 0.5 - 0.5	- 13.5 - 13.5 - 13.5	- 13.5 - 13.5 - 13.5	- 9.0 - 9.0 - 9.0	- 9.0 - 9.0 - 9.0	- 9.0 - 9.0 - 9.0	+ 9.0 + 10.0 + 10.0	- 9.0 - 10.0 - 10.0	+ 9.0 + 10.0 + 10.0	- 1.2 - 1.2 - 1.2
400	+ 25.5 + 10.5 - 2.0 - 2.0 - 2.0	- 1.5 - 1.5 - 1.5	- 16.5 - 16.5 - 16.5	- 16.5 - 16.5 - 16.5	- 10.0 - 10.0 - 10.0	- 10.0 - 10.0 - 10.0	- 10.0 - 10.0 - 10.0	+ 10.0 + 11.0 + 11.0	- 10.0 - 11.0 - 11.0	+ 10.0 + 11.0 + 11.0	- 1.2 - 1.2 - 1.2
450	+ 28.5 + 11.5 - 2.0 - 2.0 - 2.0	- 2.0 - 2.0 - 2.0	- 19.5 - 19.5 - 19.5	- 19.5 - 19.5 - 19.5	- 12.0 - 12.0 - 12.0	- 12.0 - 12.0 - 12.0	- 12.0 - 12.0 - 12.0	+ 12.0 + 13.0 + 13.0	- 12.0 - 13.0 - 13.0	+ 12.0 + 13.0 + 13.0	- 1.2 - 1.2 - 1.2
500	+ 31.5 + 12.5 - 2.0 - 2.0 - 2.0	- 2.5 - 2.5 - 2.5	- 22.0 - 22.0 - 22.0	- 22.0 - 22.0 - 22.0	- 14.0 - 14.0 - 14.0	- 14.0 - 14.0 - 14.0	- 14.0 - 14.0 - 14.0	+ 14.0 + 15.0 + 15.0	- 14.0 - 15.0 - 15.0	+ 14.0 + 15.0 + 15.0	- 1.2 - 1.2 - 1.2
550	+ 34.5 + 13.5 - 2.0 - 2.0 - 2.0	- 3.0 - 3.0 - 3.0	- 24.5 - 24.5 - 24.5	- 24.5 - 24.5 - 24.5	- 16.0 - 16.0 - 16.0	- 16.0 - 16.0 - 16.0	- 16.0 - 16.0 - 16.0	+ 16.0 + 17.0 + 17.0	- 16.0 - 17.0 - 17.0	+ 16.0 + 17.0 + 17.0	- 1.2 - 1.2 - 1.2
600	+ 37.5 + 14.5 - 2.0 - 2.0 - 2.0	- 3.5 - 3.5 - 3.5	- 27.0 - 27.0 - 27.0	- 27.0 - 27.0 - 27.0	- 18.0 - 18.0 - 18.0	- 18.0 - 18.0 - 18.0	- 18.0 - 18.0 - 18.0	+ 18.0 + 19.0 + 19.0	- 18.0 - 19.0 - 19.0	+ 18.0 + 19.0 + 19.0	- 1.2 - 1.2 - 1.2
650	+ 40.5 + 15.5 - 2.0 - 2.0 - 2.0	- 4.0 - 4.0 - 4.0	- 30.0 - 30.0 - 30.0	- 30.0 - 30.0 - 30.0	- 20.0 - 20.0 - 20.0	- 20.0 - 20.0 - 20.0	- 20.0 - 20.0 - 20.0	+ 20.0 + 21.0 + 21.0	- 20.0 - 21.0 - 21.0	+ 20.0 + 21.0 + 21.0	- 1.2 - 1.2 - 1.2
700	+ 43.5 + 16.5 - 2.0 - 2.0 - 2.0	- 4.5 - 4.5 - 4.5	- 32.5 - 32.5 - 32.5	- 32.5 - 32.5 - 32.5	- 22.0 - 22.0 - 22.0	- 22.0 - 22.0 - 22.0	- 22.0 - 22.0 - 22.0	+ 22.0 + 23.0 + 23.0	- 22.0 - 23.0 - 23.0	+ 22.0 + 23.0 + 23.0	- 1.2 - 1.2 - 1.2
750	+ 46.5 + 17.5 - 2.0 - 2.0 - 2.0	- 5.0 - 5.0 - 5.0	- 35.0 - 35.0 - 35.0	- 35.0 - 35.0 - 35.0	- 24.0 - 24.0 - 24.0	- 24.0 - 24.0 - 24.0	- 24.0 - 24.0 - 24.0	+ 24.0 + 25.0 + 25.0	- 24.0 - 25.0 - 25.0	+ 24.0 + 25.0 + 25.0	- 1.2 - 1.2 - 1.2
800	+ 49.5 + 18.5 - 2.0 - 2.0 - 2.0	- 5.5 - 5.5 - 5.5	- 37.5 - 37.5 - 37.5	- 37.5 - 37.5 - 37.5	- 26.0 - 26.0 - 26.0	- 26.0 - 26.0 - 26.0	- 26.0 - 26.0 - 26.0	+ 26.0 + 27.0 + 27.0	- 26.0 - 27.0 - 27.0	+ 26.0 + 27.0 + 27.0	- 1.2 - 1.2 - 1.2
850	+ 52.5 + 19.5 - 2.0 - 2.0 - 2.0	- 6.0 - 6.0 - 6.0	- 40.0 - 40.0 - 40.0	- 40.0 - 40.0 - 40.0	- 28.0 - 28.0 - 28.0	- 28.0 - 28.0 - 28.0	- 28.0 - 28.0 - 28.0	+ 28.0 + 29.0 + 29.0	- 28.0 - 29.0 - 29.0	+ 28.0 + 29.0 + 29.0	- 1.2 - 1.2 - 1.2
900	+ 55.5 + 20.5 - 2.0 - 2.0 - 2.0	- 6.5 - 6.5 - 6.5	- 42.5 - 42.5 - 42.5	- 42.5 - 42.5 - 42.5	- 30.0 - 30.0 - 30.0	- 30.0 - 30.0 - 30.0	- 30.0 - 30.0 - 30.0	+ 30.0 + 31.0 + 31.0	- 30.0 - 31.0 - 31.0	+ 30.0 + 31.0 + 31.0	- 1.2 - 1.2 - 1.2
950	+ 58.5 + 21.5 - 2.0 - 2.0 - 2.0	- 7.0 - 7.0 - 7.0	- 45.0 - 45.0 - 45.0	- 45.0 - 45.0 - 45.0	- 32.0 - 32.0 - 32.0	- 32.0 - 32.0 - 32.0	- 32.0 - 32.0 - 32.0	+ 32.0 + 33.0 + 33.0	- 32.0 - 33.0 - 33.0	+ 32.0 + 33.0 + 33.0	- 1.2 - 1.2 - 1.2
1000	+ 61.5 + 22.5 - 2.0 - 2.0 - 2.0	- 7.5 - 7.5 - 7.5	- 47.5 - 47.5 - 47.5	- 47.5 - 47.5 - 47.5	- 34.0 - 34.0 - 34.0	- 34.0 - 34.0 - 34.0	- 34.0 - 34.0 - 34.0	+ 34.0 + 35.0 + 35.0	- 34.0 - 35.0 - 35.0	+ 34.0 + 35.0 + 35.0	- 1.2 - 1.2 - 1.2
1050	+ 64.5 + 23.5 - 2.0 - 2.0 - 2.0	- 8.0 - 8.0 - 8.0	- 50.0 - 50.0 - 50.0	- 50.0 - 50.0 - 50.0	- 36.0 - 36.0 - 36.0	- 36.0 - 36.0 - 36.0	- 36.0 - 36.0 - 36.0	+ 36.0 + 37.0 + 37.0	- 36.0 - 37.0 - 37.0	+ 36.0 + 37.0 + 37.0	- 1.2 - 1.2 - 1.2
1100	+ 67.5 + 24.5 - 2.0 - 2.0 - 2.0	- 8.5 - 8.5 - 8.5	- 52.5 - 52.5 - 52.5	- 52.5 - 52.5 - 52.5	- 38.0 - 38.0 - 38.0	- 38.0 - 38.0 - 38.0	- 38.0 - 38.0 - 38.0	+ 38.0 + 39.0 + 39.0	- 38.0 - 39.0 - 39.0	+ 38.0 + 39.0 + 39.0	- 1.2 - 1.2 - 1.2
1150	+ 70.5 + 25.5 - 2.0 - 2.0 - 2.0	- 9.0 - 9.0 - 9.0	- 55.0 - 55.0 - 55.0	- 55.0 - 55.0 - 55.0	- 40.0 - 40.0 - 40.0	- 40.0 - 40.0 - 40.0	- 40.0 - 40.0 - 40.0	+ 40.0 + 41.0 + 41.0	- 40.0 - 41.0 - 41.0	+ 40.0 + 41.0 + 41.0	- 1.2 - 1.2 - 1.2
1200	+ 73.5 + 26.5 - 2.0 - 2.0 - 2.0	- 9.5 - 9.5 - 9.5	- 57.5 - 57.5 - 57.5	- 57.5 - 57.5 - 57.5	- 42.0 - 42.0 - 42.0	- 42.0 - 42.0 - 42.0	- 42.0 - 42.0 - 42.0	+ 42.0 + 43.0 + 43.0	- 42.0 - 43.0 - 43.0	+ 42.0 + 43.0 + 43.0	- 1.2 - 1.2 - 1.2
1250	+ 76.5 + 27.5 - 2.0 - 2.0 - 2.0	- 10.0 - 10.0 - 10.0	- 60.0 - 60.0 - 60.0	- 60.0 - 60.0 - 60.0	- 44.0 - 44.0 - 44.0	- 44.0 - 44.0 - 44.0	- 44.0 - 44.0 - 44.0	+ 44.0 + 45.0 + 45.0	- 44.0 - 45.0 - 45.0	+ 44.0 + 45.0 + 45.0	- 1.2 - 1.2 - 1.2
1300	+ 79.5 + 28.5 - 2.0 - 2.0 - 2.0	- 10.5 - 10.5 - 10.5	- 62.5 - 62.5 - 62.5	- 62.5 - 62.5 - 62.5	- 46.0 - 46.0 - 46.0	- 46.0 - 46.0 - 46.0	- 46.0 - 46.0 - 46.0	+ 46.0 + 47.0 + 47.0	- 46.0 - 47.0 - 47.0	+ 46.0 + 47.0 + 47.0	- 1.2 - 1.2 - 1.2
1350	+ 82.5 + 29.5 - 2.0 - 2.0 - 2.0	- 11.0 - 11.0 - 11.0	- 65.0 - 65.0 - 65.0	- 65.0 - 65.0 - 65.0	- 48.0 - 48.0 - 48.0	- 48.0 - 48.0 - 48.0	- 48.0 - 48.0 - 48.0	+ 48.0 + 49.0 + 49.0	- 48.0 - 49.0 - 49.0	+ 48.0 + 49.0 + 49.0	- 1.2 - 1.2 - 1.2
1400	+ 85.5 + 30.5 - 2.0 - 2.0 - 2.0	- 11.5 - 11.5 - 11.5	- 67.5 - 67.5 - 67.5	- 67.5 - 67.5 - 67.5	- 50.0 - 50.0 - 50.0	- 50.0 - 50.0 - 50.0	- 50.0 - 50.0 - 50.0	+ 50.0 + 51.0 + 51.0	- 50.0 - 51.0 - 51.0	+ 50.0 + 51.0 + 51.0	- 1.2 - 1.2 - 1.2
1450	+ 88.5 + 31.5 - 2.0 - 2.0 - 2.0	- 12.0 - 12.0 - 12.0	- 70.0 - 70.0 - 70.0	- 70.0 - 70.0 - 70.0	- 52.0 - 52.0 - 52.0	- 52.0 - 52.0 - 52.0	- 52.0 - 52.0 - 52.0	+ 52.0 + 53.0 + 53.0	- 52.0 - 53.0 - 53.0	+ 52.0 + 53.0 + 53.0	- 1.2 - 1.2 - 1.2
1500	+ 91.5 + 32.5 - 2.0 - 2.0 - 2.0	- 12.5 - 12.5 - 12.5	- 72.5 - 72.5 - 72.5	- 72.5 - 72.5 - 72.5	- 54.0 - 54.0 - 54.0	- 54.0 - 54.0 - 54.0	- 54.0 - 54.0 - 54.0	+ 54.0 + 55.0 + 55.0	- 54.0 - 55.0 - 55.0	+ 54.0 + 55.0 + 55.0	- 1.2 - 1.2 - 1.2
1550	+ 94.5 + 33.5 - 2.0 - 2.0 - 2.0	- 13.0 - 13.0 - 13.0	- 75.0 - 75.0 - 75.0	- 75.0 - 75.0 - 75.0	- 56.0 - 56.0 - 56.0	- 56.0 - 56.0 - 56.0	- 56.0 - 56.0 - 56.0	+ 56.0 + 57.0 + 57.0	- 56.0 - 57.0 - 57.0	+ 56.0 + 57.0 + 57.0	- 1.2 - 1.2 - 1.2
1600	+ 97.5 + 34.5 - 2.0 - 2.0 - 2.0	- 13.5 - 13.5 - 13.5	- 77.5 - 77.5 - 77.5	- 77.5 - 77.5 - 77.5	- 58.0 - 58.0 - 58.0	- 58.0 - 58.0 - 58.0	- 58.0 - 58.0 - 58.0	+ 58.0 + 59.0 + 59.0	- 58.0 - 59.0 - 59.0	+ 58.0 + 59.0 + 59.0	- 1.2 - 1.2 - 1.2
1650	+ 100.5 + 35.5 - 2.0 - 2.0 - 2.0	- 14.0 - 14.0 - 14.0	- 80.0 - 80.0 - 80.0	- 80.0 - 80.0 - 80.0	- 60.0 - 60.0 - 60.0	- 60.0 - 60.0 - 60.0	- 60.0 - 60.0 - 60.0	+ 60.0 + 61.0 + 61.0	- 60.0 - 61.0 - 61.0	+ 60.0 + 61.0 + 61.0	- 1.2 - 1.2 - 1.2
1700	+ 103.5 + 36.5 - 2.0 - 2.0 - 2.0	- 14.5 - 14.5 - 14.5	- 82.5 - 82.5 - 82.5	- 82.5 - 82.5 - 82.5	- 62.0 - 62.0 - 62.0	- 62.0 - 62.0 - 62.0	- 62.0 - 62.0 - 62.0	+ 62.0 + 63.0 + 63.0	- 62.0 - 63.0 - 63.0	+ 62.0 + 63.0 + 63.0	- 1.2 - 1.2 - 1.2
1750	+ 106.5 + 37.5 - 2.0 - 2.0 - 2.0	- 15.0 - 15.0 - 15.0	- 85.0 - 85.0 - 85.0	- 85.0 - 85.0 - 85.0	- 64.0 - 64.0 - 64.0	- 64.0 - 64.0 - 64.0	- 64.0 - 64.0 - 64.0	+ 64.0 + 65.0 + 65.0	- 64.0 - 65.0 - 65.0	+ 64.0 + 65.0 + 65.0	- 1.2 - 1.2 - 1.2
1800	+ 110.0 + 38.0 - 2.0 - 2.0 - 2.0	- 15.5 - 15.5 - 15.5	- 87.5 - 87.5 - 87.5	- 87.5 - 87.5 - 87.5	- 66.0 - 66.0 - 66.0	- 66.0 - 66.0 - 66.0	- 66.0 - 66.0 - 66.0	+ 66.0 + 67.0 + 67.0	- 66.0 - 67.0 - 67.0	+ 66.0 + 67.0 + 67.0	- 1.2 - 1.2 - 1.2
1850	+ 113.5 + 39.0 - 2.0 - 2.0 - 2.0	- 16.0 - 16.0 - 16.0	- 90.0 - 90.0 - 90.0	- 90.0 - 90.0 - 90.0	- 68.0 - 68.0 - 68.0	- 68.0 - 68.0 - 68.0	- 68.0 - 68.0 - 68.0	+ 68.0 + 69.0 + 69.0	- 68.0 - 69.0 - 69.0	+ 68.0 + 69.0 + 69.0	- 1.2 - 1.2 - 1.2
1900	+ 117.0 + 40.0 - 2.0 - 2.0 - 2.0	- 16.5 - 16.5 - 16.5	- 92.5 - 92.5 - 92.5	- 92.5 - 92.5 - 92.5	- 70.0 - 70.0 - 70.0	- 70.0 - 70.0 - 70.0	- 70.0 - 70.0 - 70.0	+ 70.0 + 71.0 + 71.0	- 70.0 - 71.0 - 71.0	+ 70.0 + 71.0 + 71.0	- 1.2 - 1.2 - 1.2
1950	+ 120.5 + 41.0 - 2.0 - 2.0 - 2.0	- 17.0 - 17.0 - 17.0	- 95.0 - 95.0 - 95.0	- 95.0 - 95.0 - 95.0	- 72.0 - 72.0 - 72.0	- 72.0 - 72.0 - 72.0	- 72.0 - 72.0 - 72.0	+ 72.0 + 73.0 + 73.0	- 72.0 - 73.0 - 73.0	+ 72.0 + 73.0 + 73.0	- 1.2 - 1.2 - 1.2
2000	+ 124.0 + 42.0 - 2.0 - 2.0 - 2.0	- 17.5 - 17.5 - 17.5	- 97.5 - 97.5 - 97.5	- 97.5 - 97.5 - 97.5	- 74.0 - 74.0 - 74.0	- 74.0 - 74.0 - 74.0	- 74.0 - 74.0 - 74.0	+ 74.0 + 75.0 + 75.0	- 74.0 - 75.0 - 75.0	+ 74.0 + 75.0 + 75.0	- 1.2 - 1.2 - 1.2
2050	+ 127.5 + 43.0 - 2.0 - 2.0 - 2.0	- 18.0 - 18.0 - 18.0	- 100.0 - 100.0 - 100.0	- 100.0 - 100.0 - 100.0	- 76.0 - 76.0 - 76.0	- 76.0 - 76.0 - 76.0	- 76.0 - 76.0 - 76.0	+ 76.0 + 77.0 + 77.0	- 76.0 - 77.0 - 7		

Notes (1) The dimensional tolerance in column GO shall be used corresponding to maximum material limit (NML) of hole or shaft.

(C) The dimensional tolerance in column NOT GO shall be used corresponding to least material limit (L.M.L.) of hole or shaft.

**Attached Table 16** Dimensional tolerances and form tolerances of limit gauges and reference disks for IT9Unit:  $\mu\text{m}$ 

Nominal size (mm)	Limit gauge for hole			Ring gauge			Gap gauge			Reference disk		
	Plug gauge		Rod gauge	GO ('')	NOT GO ('')	GO ('')	NOT GO ('')	GO ('')	NOT GO ('')	Check at new wear	GO ('')	NOT GO ('')
	GO ('')	NOT GO ('')	GO ('')	NOT GO ('')	GO ('')	NOT GO ('')	GO ('')	NOT GO ('')	manufacture	Check at new wear	GO ('')	NOT GO ('')
1 and over	3 + 6.0 + 4.0   0	0 + 1.0 - 1.0   1.2	- - -	- - -	- - -	- 3.5 - 6.5   0	+ 1.5 - 1.5   2	- 3.5 - 6.5   0	+ 1.5 - 1.5   2	- 4.4 - 5.6   0.6	+ 0.6 - 0.6   0.8	
3 6 + 7.2 + 4.8   0	0 + 1.2 - 1.2   1.5	- - -	- - -	- 4.0 - 8.0   0	+ 2.0 - 2.0   0	- 2.5 - 4.0   0	+ 2.0 - 2.0   0	- 2.5 - 4.0   0	+ 2.0 - 2.0   0	- 5.2 - 5.8   0.8	+ 0.8 - 0.8   1	
6 10 + 8.2 + 5.8   0	0 + 1.2 - 1.2   1.5	+ 7.8 + 6.2   0	+ 0.8 - 0.8   0	+ 2.0 - 2.0   0	+ 2.5 - 5.0   0	- 9.0 - 9.0   0	+ 2.0 - 2.0   0	- 2.5 - 5.0   0	+ 2.0 - 2.0   0	- 6.2 - 7.8   0.8	+ 0.8 - 0.8   1	
10 18 + 9.5 + 6.5   0	0 + 1.5 - 1.5   2	+ 9.0 + 7.0   0	+ 1.0 - 1.0   0	+ 2.5 - 2.5   0	+ 2.5 - 5.3   0	- 10.5 - 10.5   0	+ 2.5 - 2.5   0	- 2.5 - 5.3   0	+ 2.5 - 2.5   0	- 7.0 - 7.0   0	+ 1.0 - 1.0   1.2	
18 30 + 11.0 + 7.0   0	0 + 2.0 - 2.0   2.5 + 10.2 + 7   8	0 + 1.2 - 1.2   6.0	+ 1.2 - 1.2   6.0	+ 3.0 - 3.0   0	+ 3.0 - 3.0   4	- 12.0 - 12.0   0	+ 3.0 - 3.0   4	- 12.0 - 12.0   0	+ 3.0 - 3.0   4	- 7.8 - 7.8   1.2	+ 1.2 - 1.2   1.5	
30 50 + 13.0 + 9.0   0	0 + 2.0 - 2.0   2.5 + 12.2 + 9   8	0 + 1.2 - 1.2   7.5	+ 1.2 - 1.2   7.5	+ 3.5 - 3.5   0	+ 3.5 - 3.5   4	- 14.5 - 14.5   0	+ 3.5 - 3.5   4	- 14.5 - 14.5   0	+ 3.5 - 3.5   4	- 9.8 - 9.8   1.2	+ 1.2 - 1.2   1.5	
50 80 + 15.5 + 10.5   0	0 + 2.5 - 2.5   3 + 14.5 + 11.5   0	+ 1.5 - 1.5   9.0	+ 1.5 - 1.5   9.0	+ 4.0 - 4.0   0	+ 4.0 - 4.0   5	- 17.0 - 17.0   0	+ 4.0 - 4.0   5	- 17.0 - 17.0   0	+ 4.0 - 4.0   5	- 11.5 - 11.5   0.5	+ 1.5 - 1.5   1.5	
80 120 + 18.0 + 12.0   0	0 + 3.0 - 3.0   4 + 17.0 + 13.0   0	+ 2.0 - 2.0   10.0	+ 2.0 - 2.0   10.0	+ 5.0 - 5.0   0	+ 5.0 - 5.0   6	- 20.0 - 20.0   0	+ 5.0 - 5.0   6	- 20.0 - 20.0   0	+ 5.0 - 5.0   6	- 13.0 - 13.0   0.6	+ 2.0 - 2.0   2.5	
120 180 + 22.0 + 14.0   0	0 + 4.0 - 4.0   5 + 20.5 + 15.5   0	+ 2.5 - 2.5   12.0	+ 2.5 - 2.5   12.0	+ 6.0 - 6.0   0	+ 6.0 - 6.0   8	- 24.0 - 24.0   0	+ 6.0 - 6.0   8	- 24.0 - 24.0   0	+ 6.0 - 6.0   8	- 15.5 - 15.5   0.8	+ 2.5 - 2.5   3.5	
180 250 + 26.0 + 16.0 + 4.0   0	0 + 1.0 - 1.0   9.0   7	+ 24.5 + 17.5 + 4.0 - 0.5   7.5	- 14.0 - 28.0   - 4.0	+ 11.0 - 11.0   0	+ 11.0 - 11.0   0	- 28.0 - 28.0   0	- 14.0 - 28.0   0	- 4.0 + 11.0   0	- 3.0 - 3.0   10	- 17.5 - 24.5   0.5	+ 7.5 + 7.5 + 4.5	
250 315 + 30.0 + 18.0 + 6.0   0	0 - 12.0   8	+ 28.0 + 20.0 + 6.0   - 2.0	- 10.0 - 16.0   - 6.0	+ 14.0 - 14.0   0	+ 14.0 - 14.0   12	- 32.0 - 32.0   0	- 6.0 - 32.0   0	- 6.0 + 14.0   0	- 2.0 - 2.0   12	- 20.0 - 20.0   0.6	+ 10.0 + 10.0 + 2.0	
315 400 + 34.5 + 21.5 + 7.0   0	0 - 0.5 - 13.5   9	+ 32.5 + 23.5 + 7.0   - 2.5	- 11.5 - 11.5   0	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	
400 500 + 39.5 + 24.5 + 9.0   0	0 - 1.5 - 16.5   10	+ 37.0 + 27.0 + 9.0   - 4.0	- 14.0 - 14.0   0	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	

Notes ('')

The dimensional tolerance in column GO shall be used corresponding to maximum material limit (MML) of hole or shaft.

(\*) The dimensional tolerance in column NOT GO shall be used corresponding to least material limit (LML) of hole or shaft.

Attached Table 17 Dimensional tolerances and form tolerances of limit gauges and reference disks for IT10

Nominal size (mm)	Limit gauge for hole		Rod gauge		Ring gauge		Gap gauge		Reference disk	
	Plug gauge GO (")	NOT GO (*)	GO (")	NOT GO (*)	GO (")	NOT GO (*)	GO (")	NOT GO (*)	Check at new manufacture wear	Circularity • Cylindricity (")
Parallelism - Flatness										
1 and over	+ 6.0 + 4.0	0	+ 1.0 - 1.0	1.2 -	-	-	- 3.5 - 6.5	0 + 1.5 - 1.5	2 - 3.5 - 6.5	- 4.4 - 5.6 + 0.6 - 0.6 - 6.0 8
3	+ 7.2 + 4.8	0	+ 1.2 - 1.2	1.5 -	-	-	- 4.0 - 8.0	0 + 2.0 - 2.0	2.5 - 4.0 - 8.0	- 5.2 - 6.8 + 0.8 - 0.8 - 8.1
6	+ 8.2 + 5.8	0	+ 1.2 - 1.2	1.5 + 7.8 + 6.2	0	+ 0.8 - 0.8	- 5.0 - 9.0	0 + 2.0 - 2.0	2.5 - 5.0 - 9.0	- 6.2 - 7.8 + 0.8 - 0.8 - 8.1
10	+ 9.5 + 6.5	0	+ 1.5 - 1.5	2 + 9.0 + 7.0	0	+ 1.0 - 1.0	- 5.5 - 10.5	0 + 2.5 - 2.5	3 - 5.5 - 10.5	- 7.0 - 9.0 + 1.0 - 1.0 - 11.2
18	+ 11.0 + 7.0	0	+ 2.0 - 2.0	2.5 + 10.2 + 7.8	0	+ 1.2 - 1.2	- 6.0 - 12.0	0 + 3.0 - 3.0	4 - 6.0 - 12.0	- 7.8 - 10.2 + 1.2 - 1.2 - 12.5
30	+ 13.0 + 9.0	0	+ 2.0 - 2.0	2.5 + 12.2 + 9.8	0	+ 1.2 - 1.2	- 7.5 - 14.5	0 + 3.5 - 3.5	4 - 7.5 - 14.5	- 9.8 - 12.2 + 1.2 - 1.2 - 15.5
50	+ 15.5 + 10.5	0	+ 2.5 - 2.5	3 + 14.5 + 11.5	0	+ 1.5 - 1.5	- 9.0 - 17.0	0 + 4.0 - 4.0	5 - 9.0 - 17.0	- 11.5 - 14.5 + 1.5 - 1.5 - 15.2
80	+ 18.0 + 12.0	0	+ 3.0 - 3.0	4 + 17.0 + 13.0	0	+ 2.0 - 2.0	- 10.0 - 20.0	0 + 5.0 - 5.0	6 - 10.0 - 20.0	- 13.0 - 17.0 + 2.0 - 2.0 - 22.5
120	+ 22.0 + 14.0	0	+ 4.0 - 4.0	5 + 20.5 + 15.5	0	+ 2.5 - 2.5	- 12.0 - 24.0	0 + 6.0 - 6.0	8 - 12.0 - 24.0	- 15.5 - 20.5 + 2.5 - 2.5 - 23.5
180	+ 25.0 + 19.0	+ 7.0 - 7.0	- 2.0 - 12.0	7 + 27.5 + 20.5 + 7.0	- 3.5 - 10.5 - 17.0	- 31.0 - 7.0 + 14.0	0 10 - 17.0 - 31.0 - 7.0 + 14.0	0 10 - 20.5 - 27.5 - 3.5 - 10.5 + 10.5 + 3.5 4.5		
250	+ 33.0 + 21.0	+ 9.0 - 9.0	- 3.0 - 15.0	8 + 31.0 + 23.0 + 9.0 - 5.0	- 13.0 - 19.0 + 17.0 + 1.0	- 19.0 - 35.0 - 9.0 + 17.0 + 1.0	12 - 19.0 - 35.0 - 9.0 + 17.0 + 1.0	12 - 23.0 - 31.0 - 5.0 + 13.0 + 13.0 + 5.0 6		
315	+ 40.0 + 28.5	+ 11.0 - 4.5	- 4.5 - 17.5	9 + 36.5 + 27.5 + 11.0 - 6.5	- 15.5 - 19.0	- 15.5 - 19.0	- 15.5 - 19.0	- 15.5 - 19.0	- 15.5 - 19.0	- 15.5 - 19.0
400	+ 44.5 + 29.5	+ 14.0 - 6.5	- 6.5 - 21.5	10 + 42.0 + 32.0 + 14.0 - 6.5	- 19.0	- 19.0	- 19.0	- 19.0	- 19.0	- 19.0

Notes (\*) The dimensional tolerance in column GO shall be used corresponding to maximum material limit (MML) of hole or shaft.

(\*) The dimensional tolerance in column NOT GO shall be used corresponding to least material limit (LML) of hole or shaft.

**Attached Table 18** Dimensional tolerances and form tolerances of limit gauges and reference disks for IT11Unit:  $\mu\text{m}$ 

Nominal size (mm)	Limit gauge for hole			Ring gauge			Gap gauge			Limit gauge for shaft			
	Plug gauge		NOT GO ( <sup>†</sup> )	GO ( <sup>†</sup> )		NOT GO ( <sup>†</sup> )	GO ( <sup>†</sup> )		NOT GO ( <sup>†</sup> )	GO ( <sup>†</sup> )		NOT GO ( <sup>†</sup> )	
	GO ( <sup>†</sup> )	NOT GO ( <sup>†</sup> )	GO ( <sup>†</sup> )	NOT GO ( <sup>†</sup> )	GO ( <sup>†</sup> )	NOT GO ( <sup>†</sup> )	GO ( <sup>†</sup> )	NOT GO ( <sup>†</sup> )	GO ( <sup>†</sup> )	NOT GO ( <sup>†</sup> )	GO ( <sup>†</sup> )	NOT GO ( <sup>†</sup> )	
Cylindricity • Cylindricity													
Over	Upper dimensional tolerance		Lower dimensional tolerance		Upper dimensional tolerance		Lower dimensional tolerance		Upper dimensional tolerance		Lower dimensional tolerance		
1 and over	+12.0	+8.0	0	+2.0	-2.0	3	-	-	-	+2.0	-2.0	3	-
3	+14.5	+9.5	0	+2.5	-2.5	4	-	-	-	+2.5	-2.5	4	-
6	+17.0	+11.0	0	+3.0	-3.0	4	+16.0	+12.0	0	+9.5	-14.5	0	+2.5
10	+20.0	+12.0	0	+4.0	-4.0	5	+18.5	+13.5	0	+2.5	-11.0	0	+3.0
18	+23.5	+14.5	0	+4.5	-4.5	6	+22.0	+16.0	0	+3.0	-11.0	0	+4.0
30	+27.5	+16.5	0	+5.5	-5.5	7	+25.5	+18.5	0	+3.5	-11.0	0	+4.5
50	+31.5	+18.5	0	+6.5	-6.5	8	+29.0	+21.0	0	+4.0	-11.0	0	+5.0
80	+35.5	+20.5	0	+7.5	-7.5	10	+33.0	+23.0	0	+5.0	-12.0	0	+6.0
120	+39.0	+23.0	0	+9.0	-9.0	12	+38.0	+26.0	0	+6.0	-12.0	0	+7.0
180	+50.0	+30.0	+10.0	0	-20.0	14	+47.0	+33.0	+10.0	-17.0	-30.0	-50.0	+20.0
250	+56.5	+33.5	+15.0	-3.5	-26.5	16	+53.0	+37.0	+15.0	-33.5	-36.5	-15.0	+26.5
315	+62.5	+37.5	+15.0	-2.5	-27.5	18	+59.0	+41.0	+15.0	-24.0	-35.0	-10.0	+26.5
400	+68.5	+41.5	+20.0	-6.5	-33.5	20	+65.0	+45.0	+20.0	-10.0	-30.0	-10.0	+26.5

Notes (<sup>†</sup>) The dimensional tolerance in column NOT GO shall be used corresponding to maximum material limit (MML) of hole or shaft.(<sup>†</sup>) The dimensional tolerance in column NOT GO shall be used corresponding to least material limit (LML) of hole or shaft.

Attached Table 19 Dimensional tolerances and form tolerances of limit gauges and reference disks for IT12

Unit:  $\mu\text{m}$ 

Nominal size (mm)	Limit gauge for hole			Limit gauge for shaft			Gap gauge			Reference disk		
	Plug gauge		Rod gauge	Ring gauge		Gap gauge		GO (*)		NOT GO (*)		GO (*)
	GO (')	NOT GO (')	GO (')	NOT GO (')	GO (')	NOT GO (')	GO (')	NOT GO (')	GO (')	NOT GO (')	Check at new manufacture	Check for wear
1 and over 3	3 +12.0 +8.0	0 +2.0 -2.0	3 -	-	-	-	-	-	-	+ 2.0 -2.0	0 + 2.0 -2.0	3 - 9.4 -10.6
3 +14.5 +9.5	0 +2.5 -2.5	4 -	-	-	-	-	-	-	-	+ 2.5 -2.5	4 - 11.2 -12.8	0 + 0.6 -0.6
6 +17.0 +11.0	0 +3.0 -3.0	4 +16.0 +12.0	0 +2.0 -2.0	0 +11.0 -17.0	0 +3.0 -3.0	4 -11.0 -17.0	0 +3.0 -3.0	4 -13.2 -14.8	0 + 2.5 -2.5	4 - 11.2 -12.8	0 + 0.8 -0.8	0.8
10 +20.0 +12.0	0 +4.0 -4.0	5 +18.5 +13.5	0 +2.5 -2.5	0 +12.0 -20.0	0 +4.0 -4.0	5 -12.0 -20.0	0 +4.0 -4.0	5 -15.0 -17.0	0 + 3.0 -3.0	4 - 13.2 -14.8	0 + 0.8 -0.8	1
18 +23.5 +14.5	0 +4.5 -4.5	6 +22.0 +16.0	0 +3.0 -3.0	0 +14.5 -23.5	0 +4.5 -4.5	6 -14.5 -23.5	0 +4.5 -4.5	6 -17.8 -20.2	0 + 4.0 -4.0	5 -15.0 -17.0	0 + 1.0 -1.0	1.2
30 +27.5 +16.5	0 +5.5 -5.5	7 +25.5 +18.5	0 +3.5 -3.5	0 +16.5 -27.5	0 +5.5 -5.5	7 -16.5 -27.5	0 +5.5 -5.5	7 -20.8 -23.2	0 + 5.0 -5.0	5 -15.0 -17.0	0 + 1.2 -1.2	1.5
50 +31.5 +18.5	0 +6.5 -6.5	8 +29.0 +21.0	0 +4.0 -4.0	0 +18.5 -31.5	0 +6.5 -6.5	8 -18.5 -31.5	0 +6.5 -6.5	8 -23.5 -26.5	0 + 4.0 -4.0	5 -15.0 -17.0	0 + 1.5 -1.5	2
80 +35.5 +20.5	0 +7.5 -7.5	10 +33.0 +23.0	0 +5.0 -5.0	0 +20.5 -35.5	0 +7.5 -7.5	10 -20.5 -35.5	0 +7.5 -7.5	10 -26.0 -30.0	0 + 3.0 -3.0	5 -15.0 -17.0	0 + 2.0 -2.0	2.5
120 +41.0 +23.0	0 +9.0 -9.0	12 +38.0 +26.0	0 +6.0 -6.0	0 +23.0 -41.0	0 +9.0 -9.0	12 -23.0 -41.0	0 +9.0 -9.0	12 -29.5 -34.5	0 + 2.0 -2.0	5 -15.0 -17.0	0 + 2.5 -2.5	3.5
180 +250 +55.0	+35.0 +15.0	-5.0 -25.0	+52.0 +38.0	+15.0 -8.0	-22.0 -35.0	-55.0 -15.0	+25.0 +5.0	+5.0 -14	-35.0 -55.0	+25.0 +5.0	+14 -41.5 -48.5	+11.5 4.5
250 +315 +61.5	+38.5 +20.0	-8.5 -31.5	+58.0 +42.0	+20.0 -12.0	-28.0 -38.5	-61.5 -20.0	+31.5 +8.5	+16	-38.5 -61.5	+20.0 +31.5	+16.0 -46.0	+24.0 +16.0
315 +400 +77.5	+52.5 +30.0	-17.5 -42.5	+18.0 +74.0	+30.0 -21.0	-39.0 -	-	-	-	-	-	-	-
400 +500 +83.5	+56.5 +35.0	-21.5 -48.5	+20.0 +80.0	+60.0 +35.0	-25.0 -45.0	-	-	-	-	-	-	-

Notes (\*) The dimensional tolerance in column GO shall be used corresponding to maximum material limit (MML) of hole or shaft.

(\*) The dimensional tolerance in column NOT GO shall be used corresponding to least material limit (LML) of hole or shaft.

**Attached Table 20** Dimensional tolerances and form tolerances of limit gauges and reference disks for IT13

Init. num

Nominal size (mm)	Limit gauge for hole		Rod gauge		Ring gauge		Gap gauge		Reference disk	
	Plug gauge		NOT GO (")		GO (")		NOT GO (")		GO (")	
	GO (")	NOT GO (")	GO (")	NOT GO (")	GO (")	NOT GO (")	GO (")	NOT GO (")	GO (")	Circularity • Cylindricity
1 and over	+ 25.0	+ 15.0	0	+ 5.0	- 5.0	4	-	-	-	Tolerance
3	+ 30.0	+ 18.0	0	+ 6.0	- 6.0	5	-	-	-	Upper dimension
6	+ 35.5	+ 20.5	0	+ 7.5	- 7.5	6	+ 32.5	+ 23.5	0	Lower dimension
10	+ 41.0	+ 23.0	0	+ 9.0	- 9.0	8	+ 37.5	+ 26.5	0	Upper dimension
18	+ 46.5	+ 25.5	0	+ 10.5	- 10.5	9	+ 42.5	+ 29.5	0	Lower dimension
30	+ 54.5	+ 29.5	0	+ 12.5	- 12.5	11	+ 50.0	+ 34.0	0	Upper dimension
50	+ 63.0	+ 33.0	0	+ 15.0	- 15.0	13	+ 57.5	+ 38.5	0	Lower dimension
80	+ 71.5	+ 36.5	0	+ 17.5	- 17.5	15	+ 65.0	+ 43.0	0	Upper dimension
120	+ 80.0	+ 40.0	0	+ 20.0	- 20.0	13	+ 72.5	+ 47.5	0	Lower dimension
180	+ 103.0	+ 57.0	-	+ 25.0	-	2.0	- 48.0	+ 20	+ 94.5	+ 65.5
250	+ 116.0	+ 64.0	-	+ 35.0	-	9.0	- 61.0	+ 23	+ 106.0	+ 74.0
315	+ 128.5	+ 71.5	-	+ 45.0	-	16.5	- 73.5	+ 25	+ 118.0	+ 82.0
400	+ 141.5	+ 78.5	-	+ 55.0	-	23.5	- 86.5	+ 27	+ 130.0	+ 90.0

Notes (3) The dimensional tolerance in column GO shall be used corresponding to maximum material limit (MML) of hole or shaft.

(4) The dimensional tolerance in column NOT GO shall be used corresponding to least material limit (LML) of hole or shaft.

Attached Table 21 Dimensional tolerances and form tolerances of limit gauges and reference disks for IT14 (\*) Unit:  $\mu\text{m}$ 

Nominal size (mm)	Limit gauge for hole			Ring gauge			Gap gauge			Limit gauge for shaft		
	Plug gauge GO (*)	NOT GO (*)	GO (*)	NOT GO (*)	GO (*)	NOT GO (*)	GO (*)	NOT GO (*)	GO (*)	Check for new gauge wear	Reference disk	
Cylindricity • Cylindricity												
1 and over 3	+ 25.0 + 15.0	0	+ 5.0 - 5.0	-	-	-	-15.0 - 25.0	0	+ 5.0 - 5.0	-	-19.0 + 21.0	-1.0 + 1.0
6 + 30.0 + 18.0	0	+ 6.0 - 6.0	0	-	-	-	-10.0 - 30.0	0	+ 6.0 - 6.0	0	-22.8 - 25.2	-1.2 + 1.2
6 + 35.5 + 20.5	0	+ 7.5 - 7.5	0	+ 32.5 + 23.5	0	+ 4.5 -	-4.5 - 20.5	0	+ 7.5 - 7.5	0	-26.8 - 29.2	-1.2 + 1.2
10 + 41.0 + 23.0	0	+ 9.0 - 9.0	0	+ 37.5 + 26.5	0	+ 5.5 -	-5.5 - 23.0	0	+ 9.0 - 9.0	0	-30.5 - 33.5	-1.5 + 1.5
18 + 46.5 + 25.5	0	+ 10.5 - 10.5	0	+ 42.5 + 29.5	0	+ 6.5 -	-6.5 - 25.5	0	+ 10.5 - 10.5	0	-34.0 - 38.0	-2.0 + 2.0
30 + 54.5 + 29.5	0	+ 12.5 - 12.5	0	+ 50.0 + 34.0	0	+ 8.0 -	-8.0 - 29.5	0	+ 12.5 - 12.5	0	-40.0 - 44.0	-2.0 + 2.0
50 + 80.0 + 33.0	0	+ 15.0 - 15.0	0	+ 57.5 + 38.5	0	+ 9.5 -	-9.5 - 33.0	0	+ 15.0 - 15.0	0	-45.5 - 50.5	-2.5 + 2.5
80 + 120 + 71.5 + 36.5	0	+ 17.5 - 17.5	0	+ 65.0 + 43.0	0	+ 11.0 -	-11.0 - 36.5	0	+ 17.5 - 17.5	0	-51.0 - 57.0	-3.0 + 3.0
120 + 180 + 80.0 + 40.0	0	+ 20.0 - 20.0	0	+ 80.0 + 50.0	0	+ 12.5 - 12.5	-20.0 - 40.0	0	+ 20.0 - 20.0	0	-56.0 - 64.0	-4.0 + 4.0
180 + 250 + 123.0 + 77.0 + 45.0	+ 22.0	-	-	-	-	-	-	-	-	-	-	-
250 + 315 + 136.0 + 84.0 + 55.0	+ 29.0	-	-	-	-	-	-	-	-	-	-	-
315 + 400 + 153.5 + 95.5 + 70.0	+ 41.5	-	-	-	-	-	-	-	-	-	-	-
400 + 500 + 176.5 + 113.5 + 90.0	+ 49.0	-	-	-	-	-	-	-	-	-	-	-

Notes (\*) The dimensional tolerance in column GO shall be used corresponding to maximum material limit (MML) of hole or shaft.

(\*) The dimensional tolerance in column NOT GO shall be used corresponding to least material limit (LML) of hole or shaft.

(\*) Tolerance grade IT14 is not applicable to nominal size 1 mm

Attached Table 22 Dimensional tolerances and form tolerances of limit gauges and reference disks for IT15 (\*) Unit: μm

Nominal size (mm)	Limit gauge for hole		Rod gauge		Ring gauge		Gap gauge		Reference disk	
	Limit gauge for shaft		Gap gauge		Gap gauge		Gap gauge		Reference disk	
	Plug gauge GO (*)	NOT GO (*)	GO (*)	NOT GO (*)	GO (*)	NOT GO (*)	GO (*)	NOT GO (*)	Check size wear manual lecture	Check for wear
Circularity + Cylindricity										
1 and over	3 + 45.0 + 35.0	0 + 5.0 - 5.0	4 -	-	-	-	-	-	5.0 - 5.0	0 + 5.0 - 5.0
3	6 + 54.0 + 42.0	0 + 6.0 - 6.0	5 -	-	-	-	-	-	45.0 - 45.0	41.0 + 1.0 - 1.0
6	10 + 63.5 + 40.5	0 + 7.5 - 7.5	6 + 60.5 + 51.5	0 + 4.5 - 4.5	48.5 - 63.5	0 + 6.0 - 6.0	42.0 - 54.0	0 + 6.0 - 6.0	46.8 - 49.2	41.2 + 1.2 - 1.2
10	18 + 73.0 + 55.0	0 + 9.0 - 9.0	8 + 69.5 + 58.5	0 + 5.5 - 5.5	55.0 - 73.0	0 + 9.0 - 9.0	8 - 55.0	0 + 9.0 - 9.0	7.5 - 7.5	54.8 - 57.2
18	30 + 82.5 + 61.5	0 + 10.5 - 10.5	9 + 76.5 + 65.5	0 + 6.5 - 6.5	61.5 - 82.5	0 + 10.5 - 10.5	9 - 61.5	0 + 10.5 - 10.5	63.5 - 73.0	63.5 + 1.5 - 1.5
30	50 + 92.5 + 67.5	0 + 12.5 - 12.5	11 + 88.0 + 77.0	0 + 8.0 - 8.0	92.5 - 97.5	0 + 12.5 - 12.5	71 - 67.5	0 + 12.5 - 12.5	51.1 - 59.1	78.0 - 82.0
50	80 + 105.0 + 75.0	0 + 15.0 - 15.0	13 + 99.5 + 80.5	0 + 9.5 - 9.5	75.0 - 105.0	0 + 15.0 - 15.0	13 - 75.0	0 + 15.0 - 15.0	13 - 92.5	54.5 + 2.5 - 2.5
80	120 + 117.5 + 82.5	0 + 17.5 - 17.5	15 + 111.0 + 89.0	0 + 11.0 - 11.0	82.5 - 117.5	0 + 17.5 - 17.5	15 - 82.5	0 + 17.5 - 17.5	15 - 97.0	103.0 + 3.0 - 3.0
120	180 + 130.0 + 90.0	0 + 20.0 - 20.0	18 + 122.5 + 97.5	0 + 12.5 - 12.5	90.0 - 130.0	0 + 20.0 - 20.0	18 - 90.0	0 + 20.0 - 20.0	13 - 106.0	114.0 + 4.0 - 4.0
180	250 + 193.0 + 147.0	0 + 27.0 - 27.0	20 + 184.5 + 155.5	0 + 17.0 - 17.0	193.0 - 247.0	0 + 27.0 - 27.0	20 - 193.0	0 + 27.0 - 27.0	20 - 165.0	175.0 + 75.0 + 65.0
250	315 + 216.0 + 164.0	0 + 30.0 - 30.0	23 + 206.0 + 174.0	0 + 19.0 - 19.0	164.0 - 216.0	0 + 30.0 - 30.0	23 - 164.0	0 + 30.0 - 30.0	23 - 164.0	196.0 + 96.0 + 86.0
315	400 + 238.5 + 181.5	0 + 33.0 - 33.0	25 + 192.9 + 170.0	0 + 22.0 - 22.0	181.5 - 238.5	0 + 33.0 - 33.0	25 - 181.5	0 + 33.0 - 33.0	25 - 164.0	238.5 + 84.0
400	500 + 271.5 + 208.5	0 + 36.0 - 36.0	54 + 220.0 + 140.0	0 + 24.0 - 24.0	208.5 - 271.5	0 + 36.0 - 36.0	54 - 208.5	0 + 36.0 - 36.0	54 - 164.0	271.5 + 84.0

Notes (\*) The dimensional tolerance in column GO shall be used corresponding to maximum material limit (MML) of hole or shaft.

(\*) The dimensional tolerance in column NOT GO shall be used corresponding to least material limit (LML) of hole or shaft.

(\*) Tolerance grade IT15 is not applicable to nominal size 1 mm.

Attached Table 2.3 Dimensional tolerances and form tolerances of limit gauges and reference disks for IT16 (\*) Unit: μm

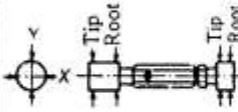
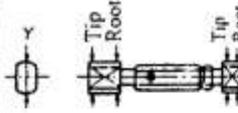
Nominal size (mm)	Limit gauge for hole			Rod gauge			Ring gauge			Gap gauge			Reference disk		
	Plug gauge GO (*)	NOT GO (*)	GO (*)	NOT GO (*)	GO (*)	NOT GO (*)	GO (*)	NOT GO (*)	GO (*)	NOT GO (*)	Check at new measurement	Check for wear	Upper dimensional tolerance	Lower dimensional tolerance	Circularity • Cylindricity
1 and over	3 + 45.0 + 35.0	0 + 5.0 - 5.0	4 -	-	-	-	-	-	-	-	0 + 5.0 - 5.0	0 + 5.0 - 5.0	0 + 5.0 - 5.0	0 + 5.0 - 5.0	0 + 5.0 - 5.0
3	6 + 54.0 + 42.0	0 + 6.0 - 6.0	5 -	-	-	-	-	-	-	-	0 + 6.0 - 6.0	0 + 6.0 - 6.0	0 + 6.0 - 6.0	0 + 6.0 - 6.0	0 + 6.0 - 6.0
6	10 + 63.5 + 48.5	0 + 7.5 - 7.5	6 + 60.5 + 51.5	0 + 4.5 - 4.5	48.5 - 48.5	63.5 - 63.5	0 + 7.5 - 7.5	6 + 7.5 - 7.5	63.5 - 63.5	0 + 7.5 - 7.5	0 + 7.5 - 7.5	0 + 7.5 - 7.5	0 + 7.5 - 7.5	0 + 7.5 - 7.5	0 + 7.5 - 7.5
10	18 + 73.0 + 55.0	0 + 9.0 - 9.0	8 + 69.5 + 58.5	0 + 5.5 - 5.5	55.0 - 55.0	73.0 - 73.0	0 + 9.0 - 9.0	8 + 9.0 - 9.0	55.0 - 55.0	0 + 9.0 - 9.0	8 + 9.0 - 9.0	55.0 - 55.0	0 + 9.0 - 9.0	8 + 9.0 - 9.0	55.0 - 55.0
18	30 + 82.5 + 61.5	0 + 10.5 - 10.5	9 + 78.5 + 65.5	0 + 6.5 - 6.5	61.5 - 61.5	82.5 - 82.5	0 + 10.5 - 10.5	9 + 10.5 - 10.5	61.5 - 61.5	0 + 10.5 - 10.5	9 + 10.5 - 10.5	61.5 - 61.5	0 + 10.5 - 10.5	9 + 10.5 - 10.5	61.5 - 61.5
30	50 + 92.5 + 67.5	0 + 12.5 - 12.5	11 + 88.0 + 72.0	0 + 8.0 - 8.0	67.5 - 67.5	92.5 - 92.5	0 + 12.5 - 12.5	11 + 12.5 - 12.5	67.5 - 67.5	0 + 12.5 - 12.5	11 + 12.5 - 12.5	67.5 - 67.5	0 + 12.5 - 12.5	11 + 12.5 - 12.5	67.5 - 67.5
50	80 + 105.0 + 75.0	0 + 15.0 - 15.0	13 + 99.5 + 80.5	0 + 9.5 - 9.5	75.0 - 75.0	105.0 - 105.0	0 + 15.0 - 15.0	13 + 15.0 - 15.0	75.0 - 75.0	0 + 15.0 - 15.0	13 + 15.0 - 15.0	75.0 - 75.0	0 + 15.0 - 15.0	13 + 15.0 - 15.0	75.0 - 75.0
80	120 + 117.5 + 82.5	0 + 17.5 - 17.5	15 + 111.0 + 89.0	0 + 11.0 - 11.0	82.5 - 82.5	117.5 - 117.5	0 + 17.5 - 17.5	15 + 17.5 - 17.5	82.5 - 82.5	0 + 17.5 - 17.5	15 + 17.5 - 17.5	82.5 - 82.5	0 + 17.5 - 17.5	15 + 17.5 - 17.5	82.5 - 82.5
120	180 + 130.0 + 90.0	0 + 20.0 - 20.0	18 + 122.5 + 97.5	0 + 12.5 - 12.5	90.0 - 90.0	130.0 - 130.0	0 + 20.0 - 20.0	18 + 20.0 - 20.0	90.0 - 90.0	0 + 20.0 - 20.0	18 + 20.0 - 20.0	90.0 - 90.0	0 + 20.0 - 20.0	18 + 20.0 - 20.0	90.0 - 90.0
180	250 + 233.0 + 187.0	0 + 110.0 - 87.0	20 + 133.0 + 100	0 + 110.0 - 87.0	133.0 + 224.5	110.0 + 195.5	0 + 110.0 - 87.0	20 + 133.0 + 100	110.0 + 133.0	0 + 110.0 - 87.0	20 + 133.0 + 100	110.0 + 133.0	0 + 110.0 - 87.0	20 + 133.0 + 100	110.0 + 133.0
250	315 + 266.0 + 214.0	0 + 140.0 - 114.0	0 + 166.0 + 123	0 + 140.0 - 114.0	214.0 + 256.0	140.0 + 224.0	0 + 140.0 - 114.0	0 + 166.0 + 123	140.0 + 214.0	0 + 140.0 - 114.0	0 + 166.0 + 123	140.0 + 214.0	0 + 140.0 - 114.0	0 + 166.0 + 123	140.0 + 214.0
315	400 + 306.5 + 251.5	0 + 180.0 - 151.5	0 + 206.5 + 151.5	0 + 180.0 - 151.5	251.5 + 296.0	151.5 + 262.0	0 + 180.0 - 151.5	0 + 206.5 + 151.5	151.5 + 251.5	0 + 180.0 - 151.5	0 + 206.5 + 151.5	151.5 + 251.5	0 + 180.0 - 151.5	0 + 206.5 + 151.5	151.5 + 251.5
400	500 + 351.5 + 288.5	0 + 220.0 - 188.5	0 + 251.5 + 220.0	0 + 220.0 - 188.5	288.5 + 340.0	188.5 + 300.0	0 + 220.0 - 188.5	0 + 251.5 + 220.0	188.5 + 340.0	0 + 220.0 - 188.5	0 + 251.5 + 220.0	188.5 + 340.0	0 + 220.0 - 188.5	0 + 251.5 + 220.0	188.5 + 340.0

Notes (\*) The dimensional tolerance in column GO shall be used corresponding to maximum material limit (MML) of hole or shaft.

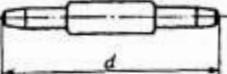
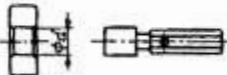
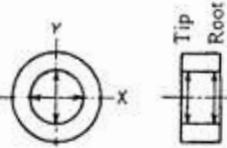
(\*) The dimensional tolerance in column NOT GO shall be used corresponding to least material limit (LML) of hole or shaft.

(\*) Tolerance grade IT16 is not applicable to nominal size 1 mm.

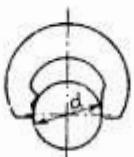
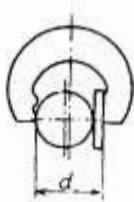
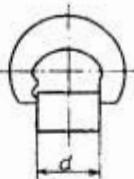
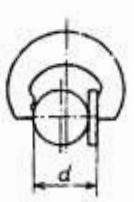
Attached Table 24 Method for measuring size of gauge portion

Number	Inspection item	Measuring method	Figure	Measuring instrument	Remarks
1	Full form cylindrical plug gauge	Outside diameter Carry out the measurement using a length measuring instrument or a substitutional instrument in two directions perpendicular each other at the tip and root. Exclude the ranges 1 mm from both ends of gauge portion for the measurement.		Length measuring instrument The gauge block of grade 1 or better specified in JIS B 7506 The microindicator specified in JIS B 7519 The electrical comparator specified in JIS B 7536	If the presence of lobing is suspected, it should be checked by three-point measurement or roundness measurement.
		Circularity Obtain the maximum value of deviation in radius at each cross section by means of a roundness measuring machine. Otherwise, make the difference in diameter at each cross section obtained from the measurement of outside diameter $\frac{1}{2}$ , and take the maximum of the values so obtained as the circularity of gauge.		The roundness measuring machine specified in JIS B 7451	
		Cylindricity Take $\frac{1}{2}$ of the difference between the maximum value and the minimum value of all the diameters obtained by measurement of outside diameter as the cylindricity of gauge.			
2	Segmental cylindrical bar gauge and segmental cylindrical bar gauge with reduced measuring faces	Outside diameter Carry out the measurement using a length measuring instrument or a substitutional instrument in two directions perpendicular each other at the tip and root. Exclude the ranges 1 mm from both ends of gauge portion for the measurement.		Length measuring instrument The gauge block of grade 1 or better specified in JIS B 7506 The microindicator specified in JIS B 7519 The electrical comparator specified in JIS B 7536	
		Cylindricity Take $\frac{1}{2}$ of the difference between the maximum value and the minimum value of all the diameters obtained by measurement of outside diameter as the cylindricity of gauge.			

Attached Table 24 Method for measuring size of gauge portion (continued)

Number	Inspection item	Measuring method	Figure	Measuring instrument	Remarks
3	Rod gauge	Length Use a length measuring instrument or a substitutional instrument, and measure the length by comparing with a gauge block.		Length measuring instrument The gauge block of grade 1 or better specified in JIS B 7506 The microindicator specified in JIS B 7519 The electrical comparator specified in JIS B 7536	Rod gauge is especially affected by temperature, therefore care shall be taken.
4	Ring gauge	Inside diameter <b>Method 1: Method by means of inspection plug gauge</b> Insert an inspection plug gauge whose actual dimensions are known into the ring gauge from its both sides without applying undue force and obtain the inside diameter of ring gauge by feeling. It is recommended to prepare several inspection gauges with possible short gauge portion and small difference in diameter.		Inspection plug gauge	The measurement by means of plug gauge may be carried out on an object of nominal size not exceeding 15 mm, but care shall be taken because error due to the feeling is likely caused.
		<b>Method 2: Method by means of length measuring instrument</b> Measure the diameter in two directions perpendicular each other in the cross section at tip and root by using a length measuring instrument or equivalent inside diameter measuring instrument. In this procedure exclude the portions 1 mm from both ends for the measurement.		Length measuring instrument The gauge block of grade 1 or better specified in JIS B 7506 The flow type air gauge specified in JIS B 7535 The electrical comparator specified in JIS B 7536	If the presence of lobing is suspected, it should be checked by three-point measurement or roundness measurement.
		Circularity Obtain the maximum value of deviation in radius at each cross section by means of a roundness measuring machine. Otherwise, make the difference in diameter at each cross section obtained from the measurement of inside diameter $\frac{1}{2}$ , and take the maximum of the values so obtained as the circularity of gauge.		The roundness measuring machine specified in JIS B 7451	

Attached Table 24 Method for measuring size of gauge portion (continued)

Number	Inspection item	Measuring method	Figure	Measuring instrument	Remarks
4	Ring gauge	Cylindricity Take $\frac{1}{2}$ of the difference between the maximum value and the minimum value of all the diameters obtained by measurement of inside diameter as the cylindricity of gauge.			
5	Gap gauge	Size <b>Method 1: Method by means of reference disk</b> Take the size of reference disk through which the gap gauge just passes by its working load only as the size of the gap gauge.		Reference disk	
		<b>Method 2: Method by means of reference disk and gauge block</b> Take the size of reference disk combined with gauge block through which the gap gauge just passes by its working load only as the size of the gap gauge.		The gauge block of grade 1 or better specified in JIS B 7506 Reference disk	
		<b>Method 3: Method by means of gauge block</b> Take the maximum size of the gauge block through which the gap gauge just passes by its working load only when appropriate gauge blocks are inserted in the gap gauge as the size of the gap gauge.		The gauge block of grade 1 or better specified in JIS B 7506	
		Parallelism <b>Method 1:</b> Confirm that the reference disk and the gauge block equal to the size of gauge part obtained using the reference disk method or the reference disk and gauge block method plus the tolerance on parallelism do not enter between the gauging surfaces by the working load of the gap gauge in any direction. This size shall not exceed the maximum permissible limit.		The gauge block of grade 1 or better specified in JIS B 7506 Reference disk	

Attached Table 24 Method for measuring size of gauge portion (continued)

Number	Inspection item	Measuring method	Figure	Measuring instrument	Remarks
5	Gap gauge Parallelism	<p><b>Method 2:</b> Confirm that the gauge block equal to the size of gauge part obtained using the method by means of gauge block plus the tolerance on parallelism does not enter between the gauging surfaces by the working load of the gap gauge in any direction.</p> <p>This size shall not exceed the maximum permissible limit.</p>		The gauge block of grade 1 or better specified in JIS B 7506	

**Annex (informative)**  
Shapes and sizes of plain limit gauges

**Introduction** This Annex describes about the shapes and sizes of some part of plain limit gauges specified in this text (hereafter referred to as "limit gauges") and limit gauges traditionally came into wide use, for the convenience of users. In many parts the expression of documents is normative but this Annex is prepared for information only and does not form a part of this Standard.

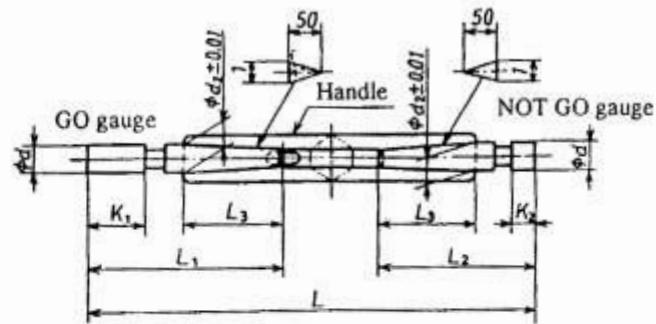
**1 Definitions** For the purpose of this Annex the following principal definitions apply:

- (1) **taper lock type** A type of gauge which is assembled by fitting the taper part of a plug gauge or rod gauge with the tapered hole of the handle.
- (2) **trilock type** A type of gauge in which three V grooves provided on the end face of a plug gauge are engaged with three projections provided on the end face of the handle to be fixed by a bolt.

**2 Shape and size** The shapes and sizes of limit gauges shall be as stated below:

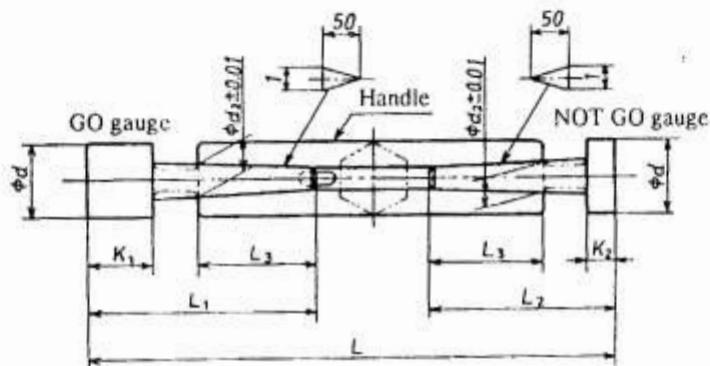
Classification		Classification by nominal size $d$ (mm)	Informative table	Informative figure
Full form cylindrical plug gauge	Taper lock type	$1 \leq d \leq 3$	Annex Table 1	Annex Fig. 1
		$3 < d \leq 14$		Annex Fig. 2
		$14 < d \leq 50$		Annex Fig. 3
	Trilock type	$50 < d \leq 65$	Annex Table 2	Annex Fig. 4
		$65 < d \leq 120$		Annex Fig. 5
	Plate plug gauge		Annex Table 3	Annex Fig. 6
		$80 < d \leq 120$		Annex Fig. 7
Rod gauge	Taper lock type	$80 < d \leq 120$	Annex Table 4	Annex Fig. 8
		$120 < d \leq 250$		Annex Fig. 9
		$250 < d \leq 500$		Annex Fig. 10
Ring gauge		$1 \leq d \leq 100$	Annex Table 5	Annex Fig. 11
Plate gap gauge	Double-ended plate gap gauge	$1 \leq d \leq 14$	Annex Table 6	Annex Fig. 12
		$14 < d \leq 50$		Annex Fig. 13
	Single-ended plate gap gauge	$3 \leq d \leq 30$	Annex Table 7	Annex Fig. 14
		$30 < d \leq 50$		Annex Fig. 15
Type C plate gap gauge		$50 < d \leq 180$	Annex Table 8	Annex Fig. 16

Unit: mm



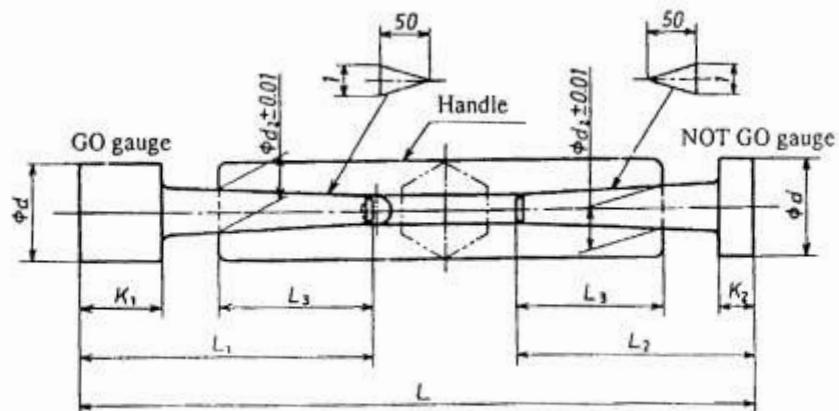
Annex Fig. 1

Unit: mm



Annex Fig. 2

Unit: mm



Annex Fig. 3

**Annex Table 1 Shape and size of full form cylindrical plug gauge**

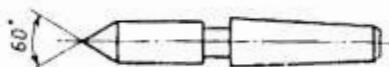
Unit: mm

Nominal size <i>d</i>		GO gauge		NOT GO gauge		<i>L</i> <sub>3</sub>	<i>d</i> <sub>2</sub>	<i>L</i>	Handle number ( <sup>1</sup> )	Annex figure number ( <sup>2</sup> )
Over	Up to and in- cluding	<i>K</i> <sub>1</sub>	<i>L</i>	<i>K</i> <sub>2</sub>	<i>L</i> <sub>2</sub>					
1 or over	3	6.5	22	4.5	20	10	2.5	62	1	Annex Fig. 1 ( <sup>3</sup> )
	3	8	25	6	24	12	4	74	2	Annex Fig. 2 ( <sup>4</sup> )
	6	10	32	7	29	15	5.5	87	3	
	10	12	40	8	36	20	7	99	4	
	14	18	16	10	42	22	9	116	5	Annex Fig. 3
	18	24		52	12	48	24	12	132	
	24	30	18	54	14	50			136	
	30	40	20	60	16	56	25	16	156	
	40	50	25	68	18	61			169	

Notes (<sup>1</sup>) The handle shall be the handle for screwed plug gauge (taper lock type) specified in the text of JIS B 3102.

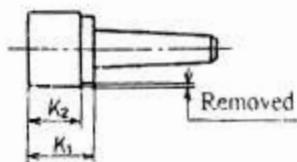
(<sup>2</sup>) In annex figures GO gauge and NOT GO gauge exist in one body, but they may be located independently in one body.

(<sup>3</sup>) Gauges of nominal size 1 or more up to and including 3 mm may be provided with an external center as given in the following figure:



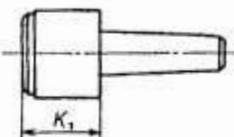
(<sup>4</sup>) If *d*<sub>2</sub> is larger than *d* in a plug gauge, the reduced portions shall be provided as illustrated by a dot-dash-line in Annex Fig. 2.

- Remarks 1 The tapered part shall be inspected by using the taper gauge for taper lock specified in the text of JIS B 3102, irrespective of the numerical values given in the table.
- 2 The plug gauge and the handle shall be assembled by lightly striking the tapered part into the handle.
- 3 The shape of NOT GO gauge may be made similar to that of GO gauge of the same nominal size range by removing the rear part as illustrated in the following figure.

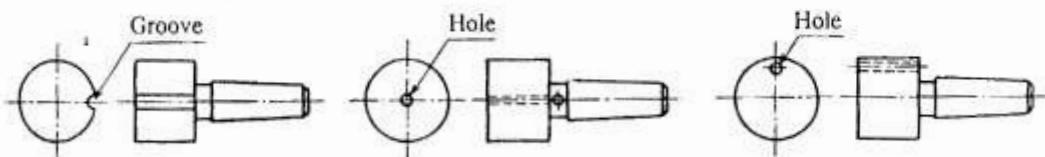


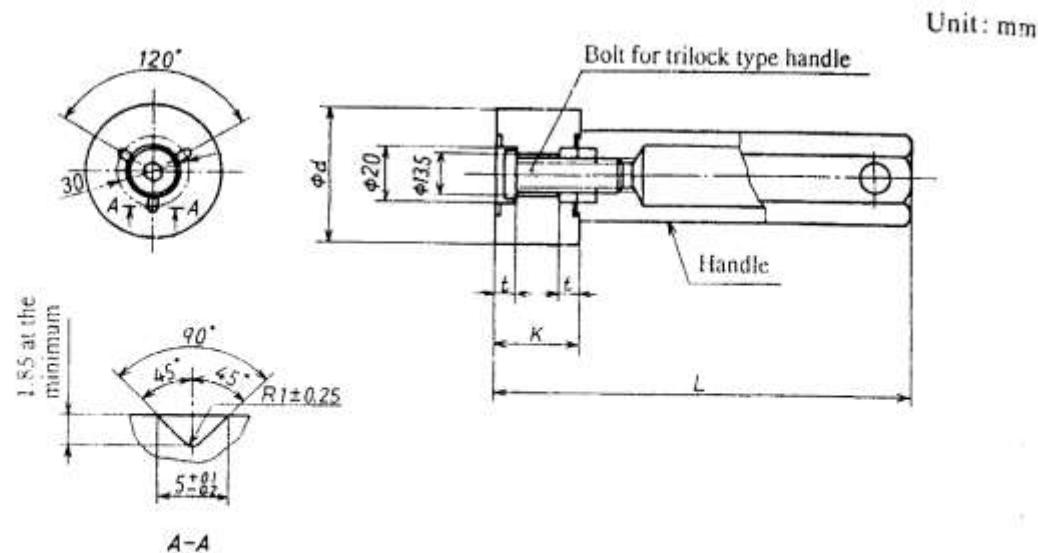
- 4 A guide may be provided at the end of GO gauge as illustrated in the figure shown below.

In the figure processing on one side is shown but both ends may be machined if necessary.

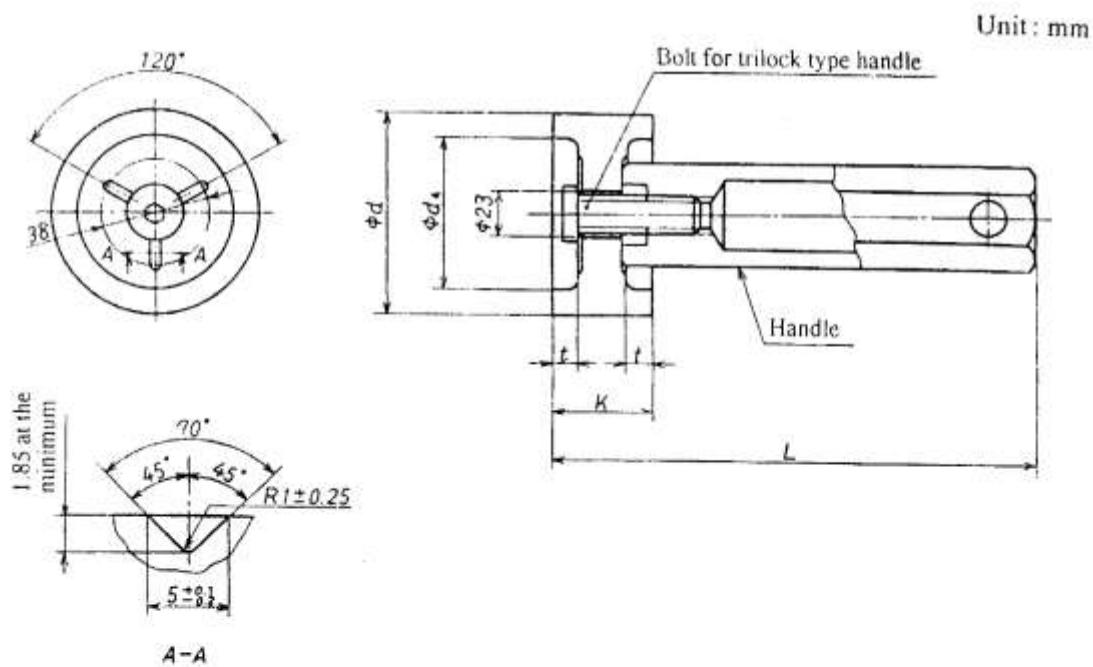


- 5 An air vent may be provided on GO gauge if necessary. Examples are shown below.





Annex Fig. 4



Annex Fig. 5

Annex Table 2 Shape and size of full form cylindrical plug gauge (trilock type)

Unit: mm

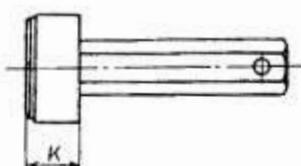
Nominal size <i>d</i>		GO gauge				NOT GO gauge				<i>d</i> <sub>4</sub>	Handle num- ber ( <sup>a</sup> )	Annex figure number
Over	Up to and in- cluding	<i>K</i>	<i>t</i>	Bolt num- ber ( <sup>a</sup> )	<i>L</i>	<i>K</i>	<i>t</i>	Bolt num- ber ( <sup>a</sup> )	<i>L</i>			
50	65	32	8	1	147	18	5	1	136	-	8	Annex Fig. 4
65	80	35	10	3	173	25	5	3	168	48	9	Annex Fig. 5
80	90									55		
90	95									60		
95	100									65		
100	110									75		
110	120	40	10	4	178	25	5	3	168	85	9	Annex Fig. 5

Notes (<sup>a</sup>) The bolt shall be the bolt for trilock type handle specified in the text of JIS B 3102.

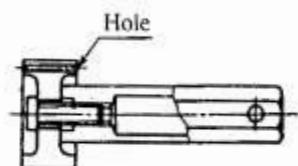
(<sup>a</sup>) The handle shall be the handle for plug gauge (trilock type) specified in the text of JIS B 3102.

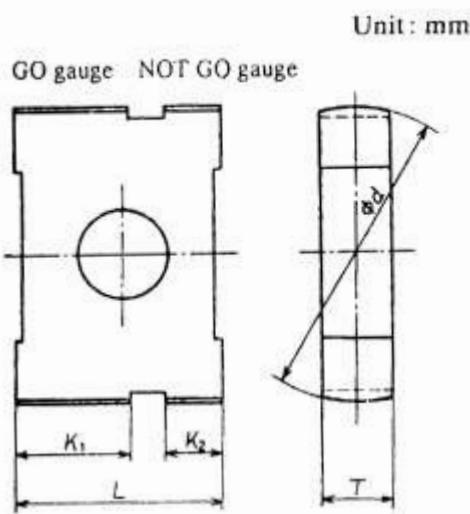
Remarks 1 A guide may be provided at the end of GO gauge as illustrated in the figure shown below.

In the figure processing on one side is shown but both ends may be machined if necessary.

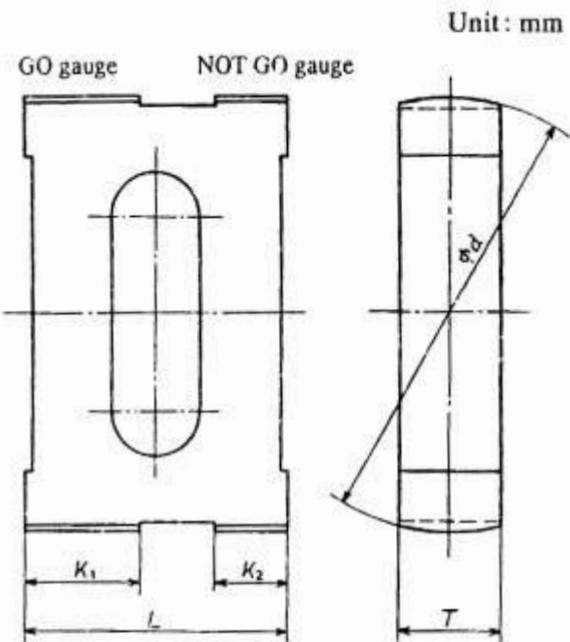


2 An air vent may be provided on GO gauge if necessary. An example is shown below.





Annex Fig. 6



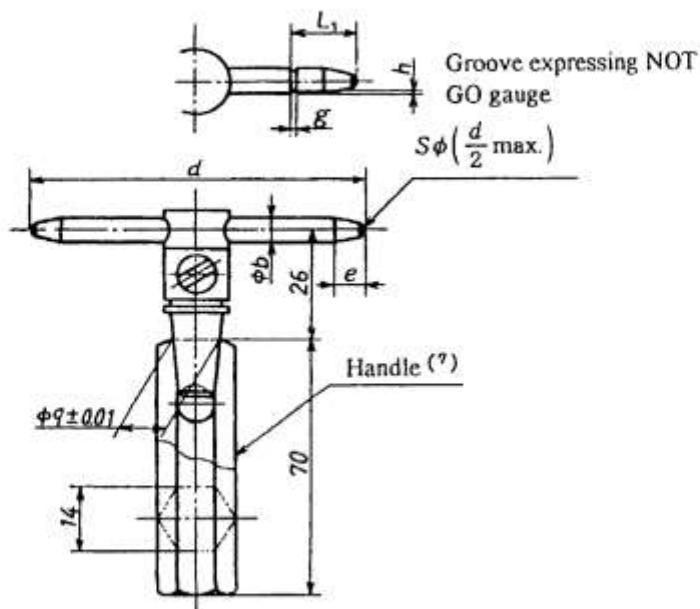
Annex Fig. 7

Annex Table 3 Shape and size of plate plug gauge

Nominal size $d$		GO gauge	NOT GO gauge	$L$	$T$	Unit: mm Annex figure number
Over	Up to and in- cluding	$K_1$	$K_2$			
80	120	32	16	60	12	Annex Fig. 6
120	180	32	16	70	16	Annex Fig. 7
180	250	32	16	80	20	Annex Fig. 7

Remarks: In the figure GO gauge and NOT GO gauge are located on one body, but either one only on one body may be allowed.

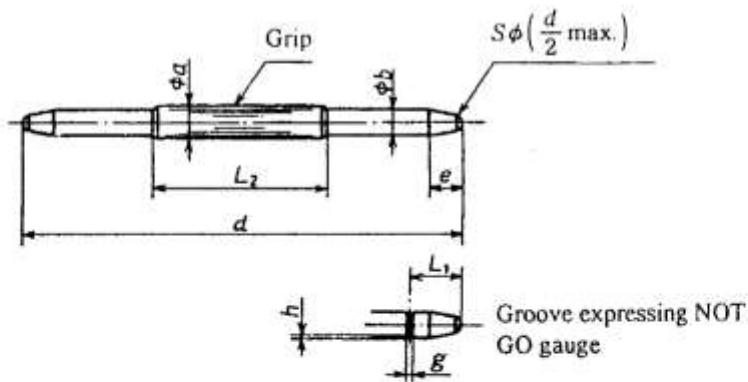
Unit: mm



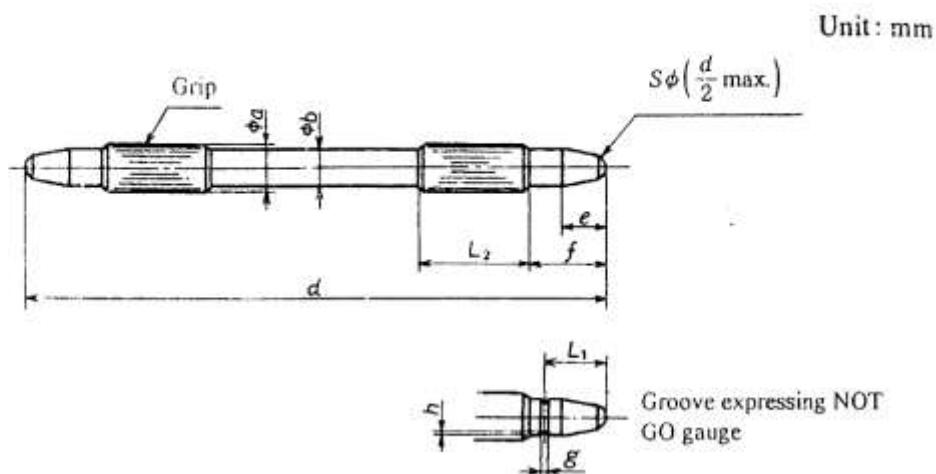
Note (7) The handle in Annex Fig. 8 shall be the number 5 handle for screwed plug gauge (taper lock type) specified in the text of JIS B 3102.

Annex Fig. 8

Unit: mm



Annex Fig. 9

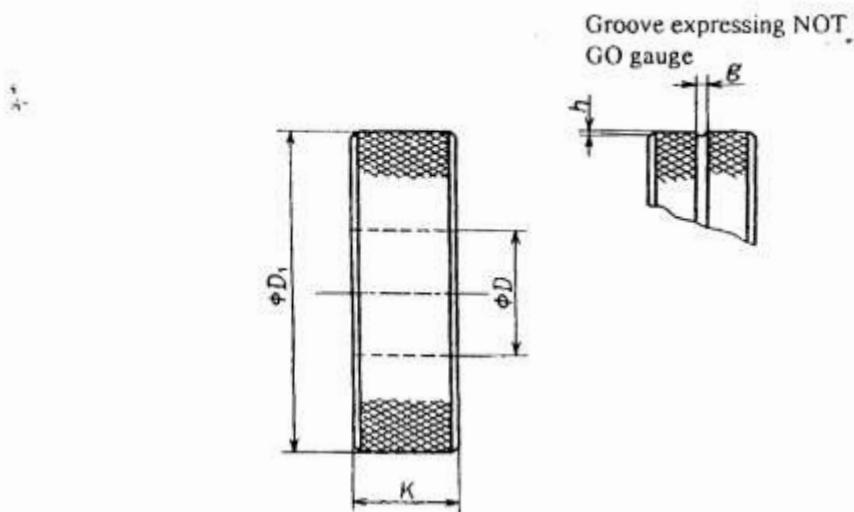


Annex Fig. 10

Annex Table 4 Shape and size of rod gauge

Nominal size $d$		$a$	$b$	$e$	$f$	Groove expressing NOT GO gauge		$L_1$	$L_2$	Annex figure number
Over	Up to and in- cluding					$g$	$h$			
80	120	—	10	10	—	2	0.6	18	—	Annex Fig. 8
120	180	16	12	12	—			22	60	Annex Fig. 9
180	250								80	
250	315	20	16	16	30			26	50	Annex Fig. 10
315	500	24	18	20	45	2.5	0.8	32	60	

- Remarks 1 The tapered part in the mounting portion shown in Annex Fig. 8 shall be inspected by using the taper gauge for taper lock specified in the text of JIS B 3102 irrespective of the numerical values given in the table.
- 2 The gauge mounting part and the handle shown in Annex Fig. 8, shall be assembled by lightly striking the tapered part.
- 3 The material for the grip shown in Annex Figs. 9 and 10 is optional, but material with thermal insulating effect should be used.

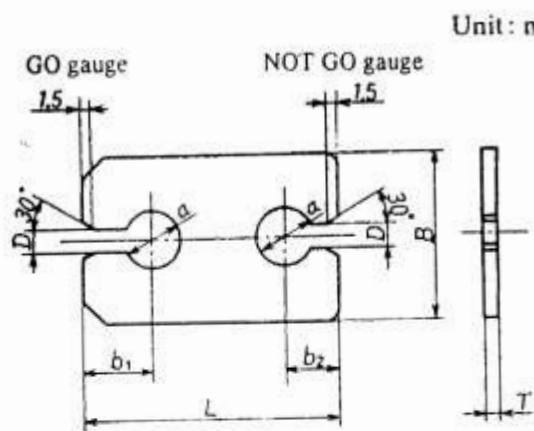


Annex Fig. 11

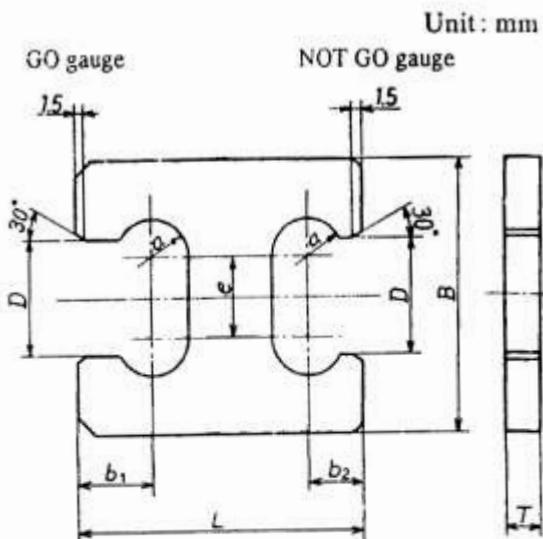
Annex Table 5 Shape and size of ring gauge

Unit: mm

Nominal size $D$		Outside diameter $D_1$	Thickness $K$	Groove expressing NOT GO gauge	
Over	Up to and including			$g$	$h$
1 or over	2.5	22	4	0.6	0.6
2.5	5		5		
5	10	32	8	1	0.8
10	15	38	10	2	1
15	20	45	12		
20	25	53	14		
25	32	63	16		
32	40	71	18	3	1.5
40	50	85	20		
50	60	100	24		
60	70	112			
70	80	125			
80	90	140			
90	100	160			



Annex Fig. 12

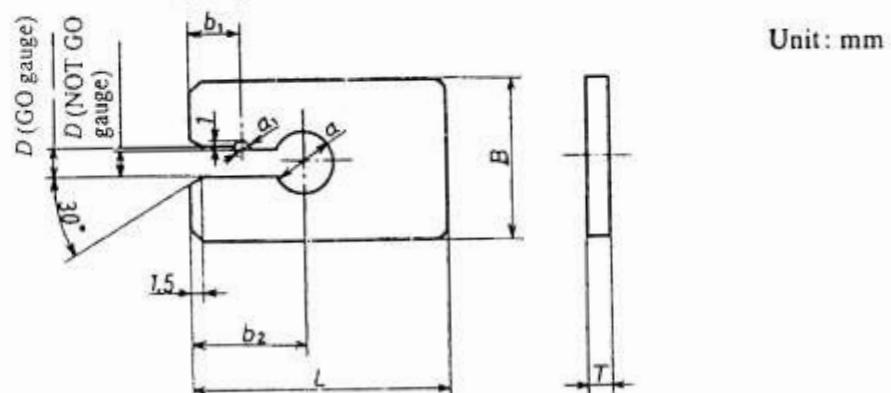


Annex Fig. 13

Annex Table 6 Shape and size of double-ended plate gap gauge

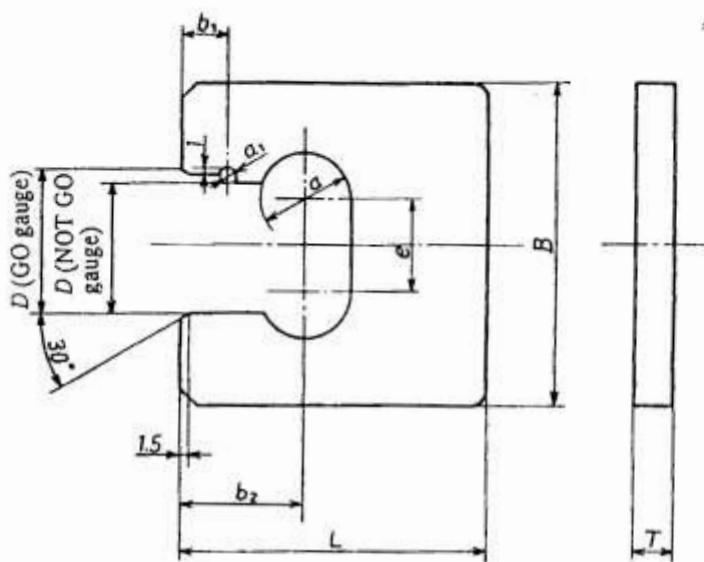
Nominal size $D$		$B$	$L$	$T$	$b_1$	$b_2$	$a$	$e$	Unit: mm Annex figure number
Over	Up to and including								
1 or over	3	25	50	3	11	8	8	-	Annex Fig. 12
	3	6	30		14	10	11		
	6	10	36		16	12	12		
	10	14	50		18	14	18	-	
	14	18	60		21	17	13	14	Annex Fig. 13
	18	24	65				14	15	
	24	30	75	5	23	18	18	19	
	30	40	90		28	20	23	24	
	40	50	110		32	22	30	31	

Remarks: In the figure GO gauge and NOT GO gauge are located on one body, but either one only on one body may be allowed.



Annex Fig. 14

Unit: mm



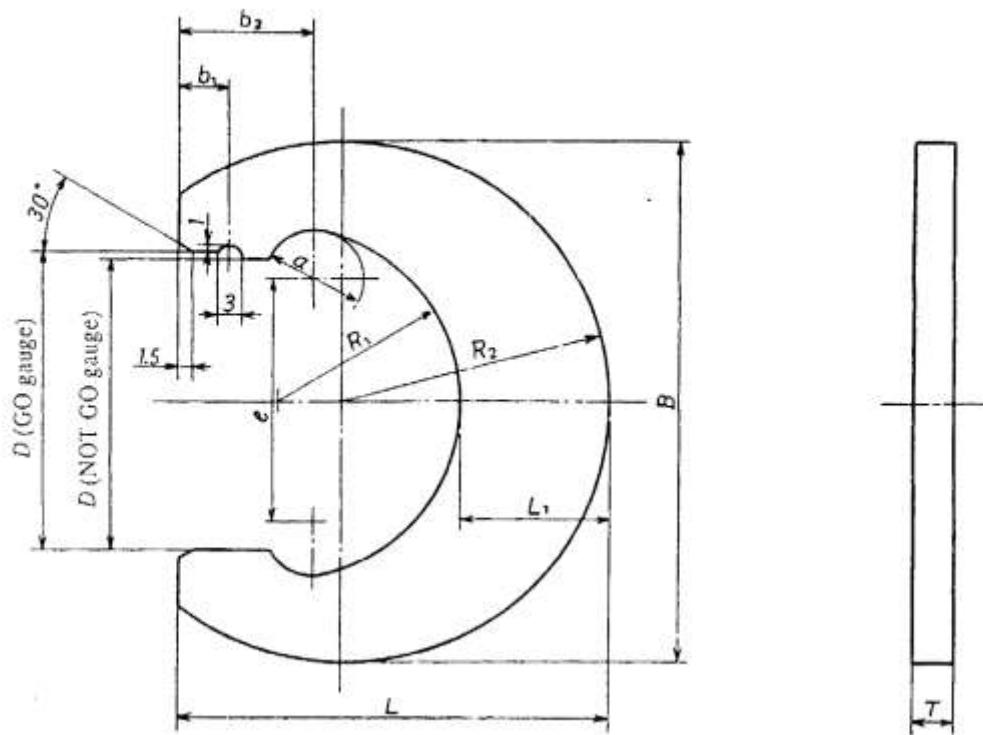
Annex Fig. 15

Annex Table 7 Shape and size of single-ended plate gap gauge

Nominal size $D$		$B$	$L$	$T$	$b_1$	$b_2$	$a$	$a_1$	$e$	Unit: mm Annex figure number
Over	Up to and including									
3 or over	6	30	50	4	10	22	11	3	5	Annex Fig. 14
	6	10	36		11	23	12	5		
	10	14	50		12	28	18			
	14	18	60		13	32	25			
	18	24	65		14	34	28			
	24	30	75		15	36	34			
	30	40	90	90	5	17	40	22	24	Annex Fig. 15
	40	50	110	100		19	43	28	30	

Remarks: In the figure GO gauge and NOT GO gauge are located on one body, but either one only on one body may be allowed.

Unit: mm



Annex Fig. 16

Annex Table 8 Shape and size of C type plate gap gauge

Nominal size $D$		$B$	$L$	$T$	$L_1$	$R_1$ (about)	$R_2$	$b_1$	$b_2$	$a$	$e$	Unit: mm
Over	Up to and including											
50 or over	65	120	100	6	36	36	60	18	35	15	55	
	65	80	142		41	45	71	19	38	18	69	
	80	100	162		45	55	81	20	40	20	88	
	100	120	192	8	51	65	96	22	44	22	106	
	120	140	218		54	75	109	23	46		126	
	140	160	236		58	85	118	24	48	25	143	
	160	180	258		60	95	279	25	52		163	

Remarks: In the figure GO gauge and NOT GO gauge are located on one body, but either one only on one body may be allowed.