

JIS

JAPANESE INDUSTRIAL STANDARD

Pneumatic cylinders — mounting dimensions

JIS B 8368—1990

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In the event of any doubt arising,
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Pneumatic cylinders - mounting dimensions

B 8368-1990

1. Scope

This Japanese Industrial Standard specifies the mounting dimensions of the pneumatic cylinders of the following types (hereafter referred to as the "cylinders") to be used in pneumatic systems for general industry.

- (1) Integral mounting cylinders for 1 MPa {10.2 kgf/cm²} (hereafter referred to as the "Type 1P-I").
- (2) Detachable mounting cylinders for 1 MPa {10.2 kgf/cm²} (hereafter referred to as the "Type 1P-II").
- (3) Cylinders of inside diameter 8 mm to 25 mm for 1 MPa {10.2 kgf/cm²} (hereafter referred to as the "Type 1P-III").

- Remarks 1. This Standard has defined the necessary mounting dimensions and sizes for interchangeability so as not to obstruct the technical development of manufacturers, and it does not specify the interior designs of the cylinders.
2. The applicable Standards to this Standard are given in Attached Table 26.
 3. The equivalent International Standards to this Standard are given in Attached Table 27.
 4. The units and numerical values given in { } in this Standard are in accordance with the traditional units, and are appended for informative reference.

2. Definitions

For the purposes of this Standard the following definitions apply, and others are in accordance with JIS B 0142.

Informative Reference: The prescriptions of terms are given in ISO 5598.

- (1) rod side ⁽¹⁾ That side from which the piston rod is exposed to outside.
- (2) head side ⁽¹⁾ That side from which the piston rod is not exposed to outside.
- (3) mounting part When a cylinder is mounted to a machine, that place which receives the reaction against the thrust of the cylinder.

Note ⁽¹⁾ In JIS B 0142, the rod side is defined as the head side, and the head side as the cap side.

3. Inside Diameters of Cylinders

The inside diameters of the cylinders (hereafter referred to as the "inside diameters") shall be in accordance with Table 1 according to the types.

Table 1. Inside Diameters of Cylinders

Unit: mm

Type	Inside diameter
Type 1P-I	32, 40, 50, 63, 80, 100, 125, 160, 200, 250
Type 1P-II	32, 40, 50, 63, 80, 100, 125, 160, 200, 250, 320
Type 1P-III	8, 10, 12, 16, 20, 25

4. Nominal Strokes

The nominal strokes (hereafter referred to as the "strokes") shall be in accordance with Table 2, and the tolerances on strokes, with Table 3.

Table 2. Nominal Strokes

Unit: mm

25, 32, 40, 50, 63, 80, 100, 125, 160,
200, 250, 320, 400, 500, 630, 800, 1000

Remarks: In the case where other numerical values than those given in Table are required, those shall be in accordance with R'10 of ISO 497.

Table 3. Tolerances on Strokes

Unit: mm

Type	Inside diameter	Stroke (S)	Tolerances on stroke
Type 1P-III	8	$S < 100$	$\begin{matrix} +1.5 \\ 0 \end{matrix}$
	10		
	12		
	16		
	20		
	25		
Type 1P-I	32	$S < 500$	+2
Type 1P-II	40	$500 < S < 1\ 250$	+3.2
	50		
	63	$S < 500$	$\begin{matrix} +2.5 \\ 0 \end{matrix}$
	80	$500 < S < 1\ 250$	$\begin{matrix} +4 \\ 0 \end{matrix}$
	100		
	125	$S < 500$	$\begin{matrix} +4 \\ 0 \end{matrix}$
	160	$500 < S < 1\ 250$	$\begin{matrix} +5 \\ 0 \end{matrix}$
	200		
	250		

Remarks: Tolerances for those of which strokes exceeding the values given in Table shall be as agreed between the parties concerned.

5. Mounting Types, Mounting Dimensions (2) of Cylinders and Tolerances on Mounting Dimensions

Note (2) As regards the term "mounting dimensions", in the case where it is not liable to cause misunderstanding, it may also be used simply as the "dimensions".

5.1 Mounting Types, Mounting Dimensions and Tolerances on Mounting dimensions The mounting types, mounting dimensions of cylinders and tolerances on mounting dimensions shall be in accordance with Table 4.

Furthermore, the tolerances on mounting dimensions to which stroke is added shall be given to the value to which the stroke has been added.

In addition, the tolerances on mounting dimensions to which stroke is added, in the cylinders exceeding 1250 mm, shall be as agreed between the parties concerned.

Table 4. Mounting Types and Mounting Dimensions

Type	Mounting type	Mounting dimension		
		Type 1P-I	Type 1P-II	Type 1P-III
MF1	Rod side rectangular flange mounting type	Attached Table 2	Attached Table 14	-
MF2	Head side rectangular flange mounting type	Attached Table 3	Attached Table 15	-
MF8	Rod side rectangular flange mounting type - two mounting bolt holes	-	-	Attached Table 22
MP1	Head clevis mounting type	Attached Table 4	-	-
MP2	Head separated type clevis mounting type	-	Attached Table 16	-
MP3	Head eye mounting type	Attached Table 5	-	Attached Table 23
MP4	Head separated type eye mounting type	-	Attached Table 17	-
MR3	Rod side thread cover mounting type	-	-	Attached Table 24
MS1	Axial direction foot mounting type	-	Attached Table 18	-
MS2	Vertical to axial direction mounting type	Attached Table 6	-	-
MS3	Rod side foot mounting type	-	-	Attached Table 25
MT1	Rod cover trunnion mounting type	Attached Table 7	-	-
MT2	Head cover trunnion mounting type	Attached Table 8	-	-
MT4	Intermediate trunnion mounting type	Attached Table 9	Attached Table 19	-
MX1	Double side stud or tie rod mounting type	Attached Table 10	Attached Table 20	-
MX2	Head side stud or tie rod mounting type	Attached Table 11	-	-
MX3	Rod side stud or tie rod mounting type	Attached Table 12	-	-

Remarks 1. Attached tables 1, 13 and 21 indicate basic dimensions.

2. Symbols + and +/- in Attached Tables are in accordance with 7.2 (Meanings of letters and symbols) of JIS B 8366.

5.2 Dimensions of Type 1P-I The mounting dimensions and mounting places of Type 1P-I shall be in accordance with Attached Tables 1 to 12.

5.3 Dimensions of Type 1P-II The mounting dimensions and mounting places of Type 1P-II shall be in accordance with Attached Tables 13 to 20.

5.4 Dimensions of Type 1P-III The mounting dimensions and mounting places of Type 1P-III shall be in accordance with Attached Tables 21 to 25.

6. Combinations of Inside Diameters and Port Threads

The combinations of the inside diameters and port threads shall be in accordance with Table 5.

Furthermore, in the case where these are not applicable, whichever combination given in Table 6 shall be applied.

Table 5. Combinations of Inside Diameters and Port Threads

Inside diameter	Minimum port thread ⁽³⁾
8 10 12 16	$Rc^{1/16}$
20 25 32	$Rc^{1/8}$
40 50	$Rc^{1/4}$
63 80	$Rc^{3/8}$
100 125	$Rc^{1/2}$
160 200	$Rc^{3/4}$
250 320	$Rc1$

Note ⁽³⁾ This is in accordance with
JIS B 0203.

Table 6. Combinations of Inside Diameters and Port Threads

Inside diameter	Minimum port threads		
	ISO 261	ISO 228/1	Table 2 of ISO 7180
8 10 12 16	M5 x 0.5	G ¹ / ₁₆	¹ / ₁₆ -27NPS
20 25 32	M10 x 1	G ¹ / ₈	¹ / ₈ -27NPS
40 50	M14 x 1.5	G ¹ / ₄	¹ / ₄ -18NPS
63 80	M18 x 1.5	G ³ / ₈	³ / ₈ -18NPS
100 125	M22 x 1.5	G ¹ / ₂	¹ / ₂ -14NPS
160 200	M27 x 2	G ³ / ₄	³ / ₄ -14NPS
250 320	M33 x 2	G1	1-11 ¹ / ₂ NPS

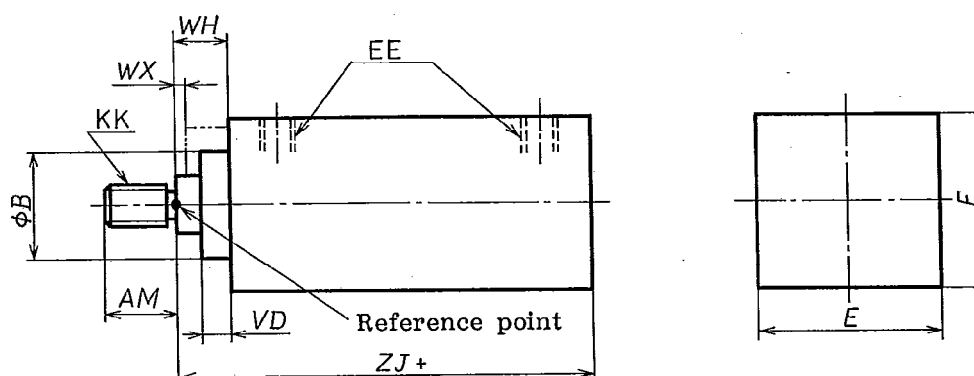
7. Piston Rods

The piston rod dimensions and shapes of respective types shall be in accordance with JIS B 8366.

8. Clear Statements of Applicable Standards

When this Standard is to be quoted in specifications, catalogs and sales data, etc., the number of Standard and the title of Standard shall be clearly stated.

Attached Table 1. Basic Dimensions (4)



Unit: mm

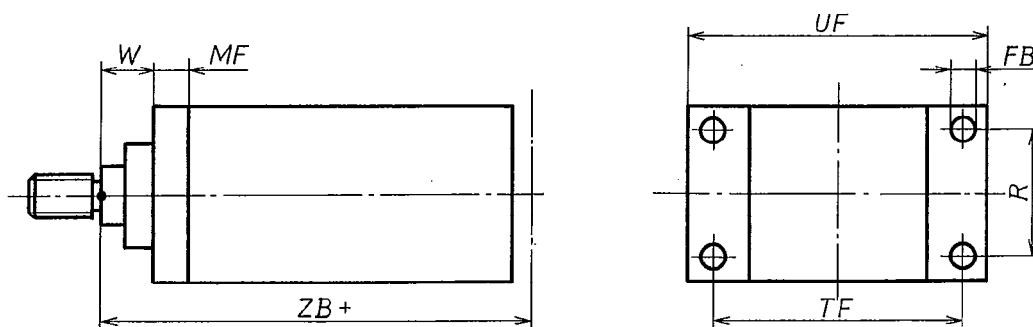
inside diameter	E max.	B 19	WX ⁽⁵⁾ inside diameter	VD inside diameter	WH		ZJ		KK ⁽⁶⁾	AM		EE
					Designation	Tolerances	Designation	Tolerances		Designation	Tolerances	
32	45	24	9	5	15	±1.6	118	±1.6	M10×1.25	22	0 -2	Rc 1/8
40	51	30	8	5	15	±1.6	118	±1.6	M12×1.25	24		Rc 1/4
50	64	34	8	5	15	±1.6	118	±1.6	M16×1.5	32		Rc 1/4
63	77	34	6	5	15	±2	121	±2	M16×1.5	32		Rc 3/8
80	96	39	9	5	19	±2	143	±2	M20×1.5	40		Rc 3/8
100	115	39	9	5	19	±2	143	±2	M20×1.5	40		Rc 1/2
125	140	46	7	5	19	±2.5	149	±2.5	M27×2	54		Rc 1/2
160	179	55	6	5	21	±2.5	172	±2.5	M36×2	72		Rc 3/4
200	217	55	6	5	21	±2.5	172	±2.5	M36×2	72		Rc 3/4
250	271	60	5	4	23	±3	210	±3	M42×2	84		Rc 1

Notes (4) Basic dimensions shall be common to all mounting types.

(5) In WX, the height of tie rod nut is included, but the length of tie rod projecting from the nut is not included.

(6) KK and AM shall be in accordance with the longer type of the rod end thread of JIS B 8366.

Attached Table 2. Rod Side Rectangular Flange Mounting Type MF1

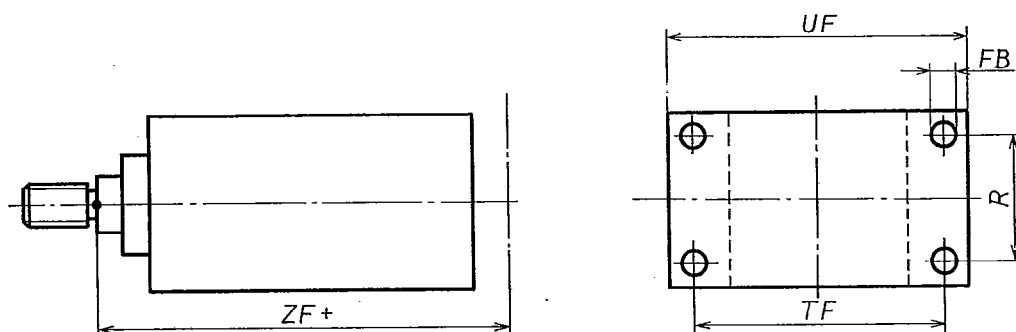


Unit: mm

Inside diameter	UF max.	FB H13	TF Js14	R Js14	W		MF		ZB ⁽⁷⁾ max.
					Designation	Tolerances	Designation	Tolerances	
32	72	7	58	33	15	+1.6	10	±0.3	125
40	84	7	70	36	15	±1.6	10	±0.3	125
50	104	9	86	47	15	±1.6	10	±0.3	125
63	116	9	98	56	15	±2	10	±0.3	130
80	143	12	119	70	19	±2	16	±0.3	153
100	162	12	138	84	19	±2	16	±0.3	153
125	196	14	168	104	19	±2.5	16	±0.3	162
160	248	18	212	134	21	±2.5	20	±0.5	188
200	286	18	250	163	21	±2.5	20	±0.5	188
250	356	22	312	201	23	±3	25	±0.5	229

Note (7) In ZB, the height of tie rod nut is included, but the length of tie rod projecting from the nut is not included.

Attached Table 3. Head Side Rectangular Flange Mounting Type MF2



Unit: mm

Inside diameter	UF max.	FB H13	TF Js14	R Js14	ZF	
					Designation	Tolerances
32	72	7	58	33	128	± 1.2
40	84	7	70	36	128	± 1.2
50	104	9	86	47	128	± 1.2
63	116	9	98	56	131	± 1.6
80	143	12	119	70	159	± 1.6
100	162	12	138	84	159	± 1.6
125	194	14	168	104	165	± 2
160	248	18	212	134	192	± 2
200	286	18	250	163	192	± 2
250	356	22	312	201	235	± 2.5