
**Fluid power systems and components —
Cylinders — Identification code for
mounting dimensions and mounting
types**

*Transmissions hydrauliques et pneumatiques — Vérins — Code
d'identification des dimensions de montage et des modes de fixation*

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 6099 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 3, *Cylinders*.

This fourth edition cancels and replaces the third edition (ISO 6099:2001), which has been technically revised.

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Introduction

In fluid power systems, power is transmitted and controlled through a fluid (liquid or gas) under pressure within an enclosed circuit. Systems and their components are generally designed and marketed for a specific fluid pressure.

One such component is the fluid power cylinder. This is a device which converts power into linear mechanical force and motion. It consists of a movable element, i.e. a piston and piston rod, operating within a cylindrical bore.

Although this International Standard provides a code and means of dimensioning for cylinder mounting, it is not intended that all dimensions be standardized. The code specified in this International Standard is not to be considered as complete for the development of future interchangeability standards. It establishes uniform descriptions for dimensions and achieves conformity of language.

The code can be used for analogous dimensions when this involves neither confusion nor misunderstanding.

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Fluid power systems and components — Cylinders — Identification code for mounting dimensions and mounting types

1 Scope

This International Standard establishes a convention for the identification of mounting dimensions and types used in the mounting of fluid power cylinders. It specifies a code for identifying cylinder mounting, envelope, accessory and connector dimensions, and for cylinder mounting and accessory types.

This International Standard does not represent a standard list of all fluid power cylinder mounting and accessory types.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 5598, *Fluid power systems and components — Vocabulary*
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3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5598 apply.

4 Identification code for rod end types

4.1 Reference points and letter codes

4.1.1 General

4.1.1.1 First point of reference

Axial dimensions are determined from a reference point that is the same for all cylinders, whatever their mounting method. This theoretical reference point (TRP) is the point of force transfer from the piston rod to the movable element. This point of reference (TRP) is named the first TRP.

4.1.1.2 Second point of reference

For double rod cylinders, the second TRP is defined by the letter code ZM++ directly attached to the first point of TRP (see Figure 8). This second TRP is used for accessories on the second rod side.

4.1.2 Plain rod end

For a plain rod end, the reference point is located on the rod centreline at the end of the piston rod. See Figure 1.

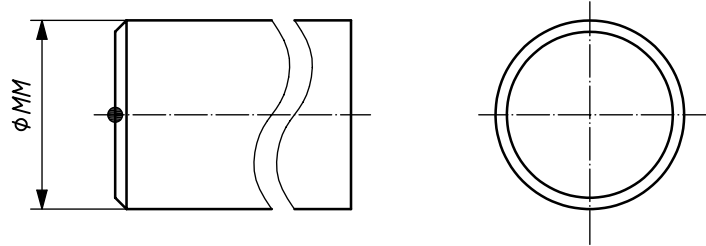


Figure 1 — RPE_x: Plain rod end

4.1.3 Pin rod end

For a pin rod end, the reference point is located at the intersection of the pin and piston rod centrelines. See Figure 2.

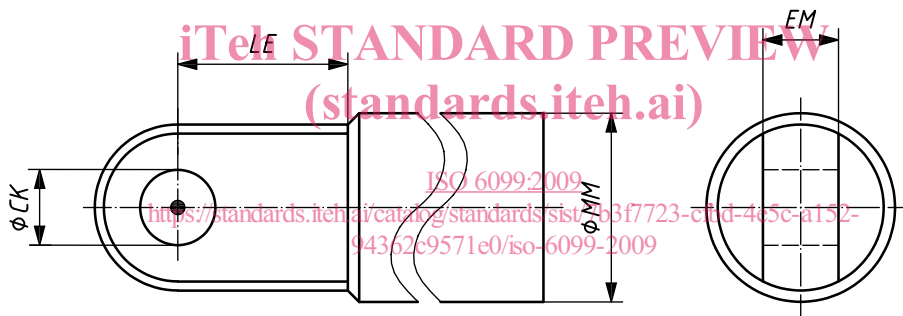


Figure 2 — RPR_x: Pin rod end

4.1.4 Female threaded rod end

For a female threaded rod end, the reference point is located on the rod centreline at the end of the piston rod. See Figure 3.

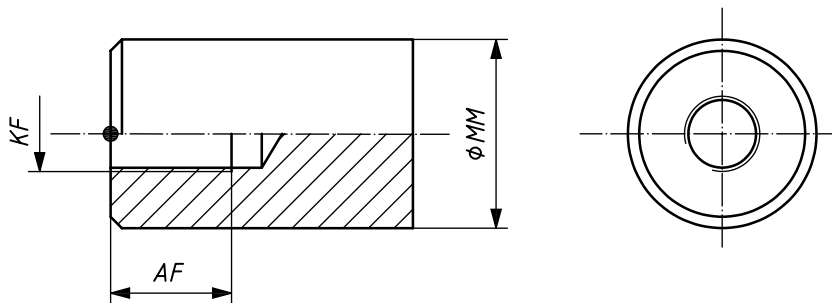
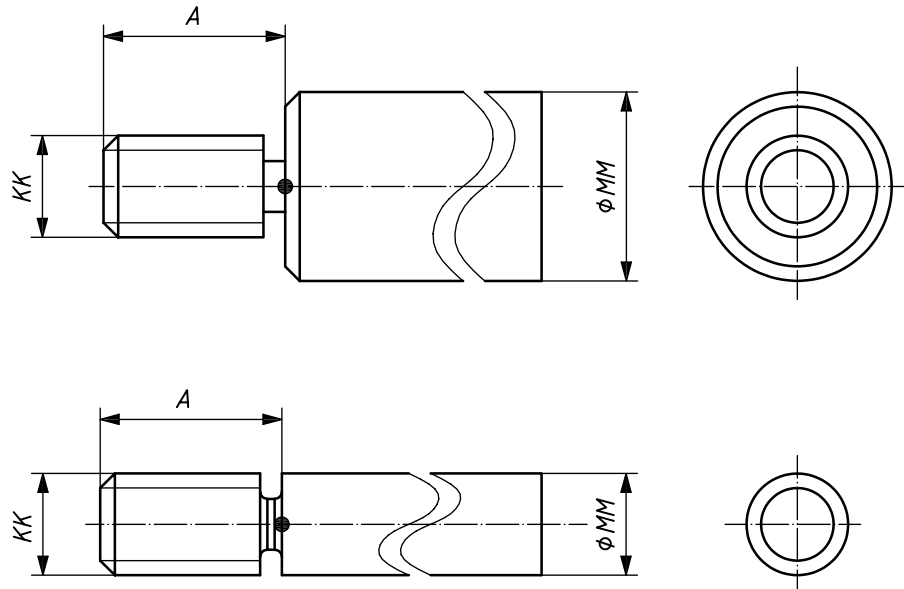


Figure 3 — RTF_x: Female threaded rod end

4.1.5 Male threaded rod end

For a male threaded rod end, the reference point is located on the rod centreline, at the shoulder level. See Figure 4.



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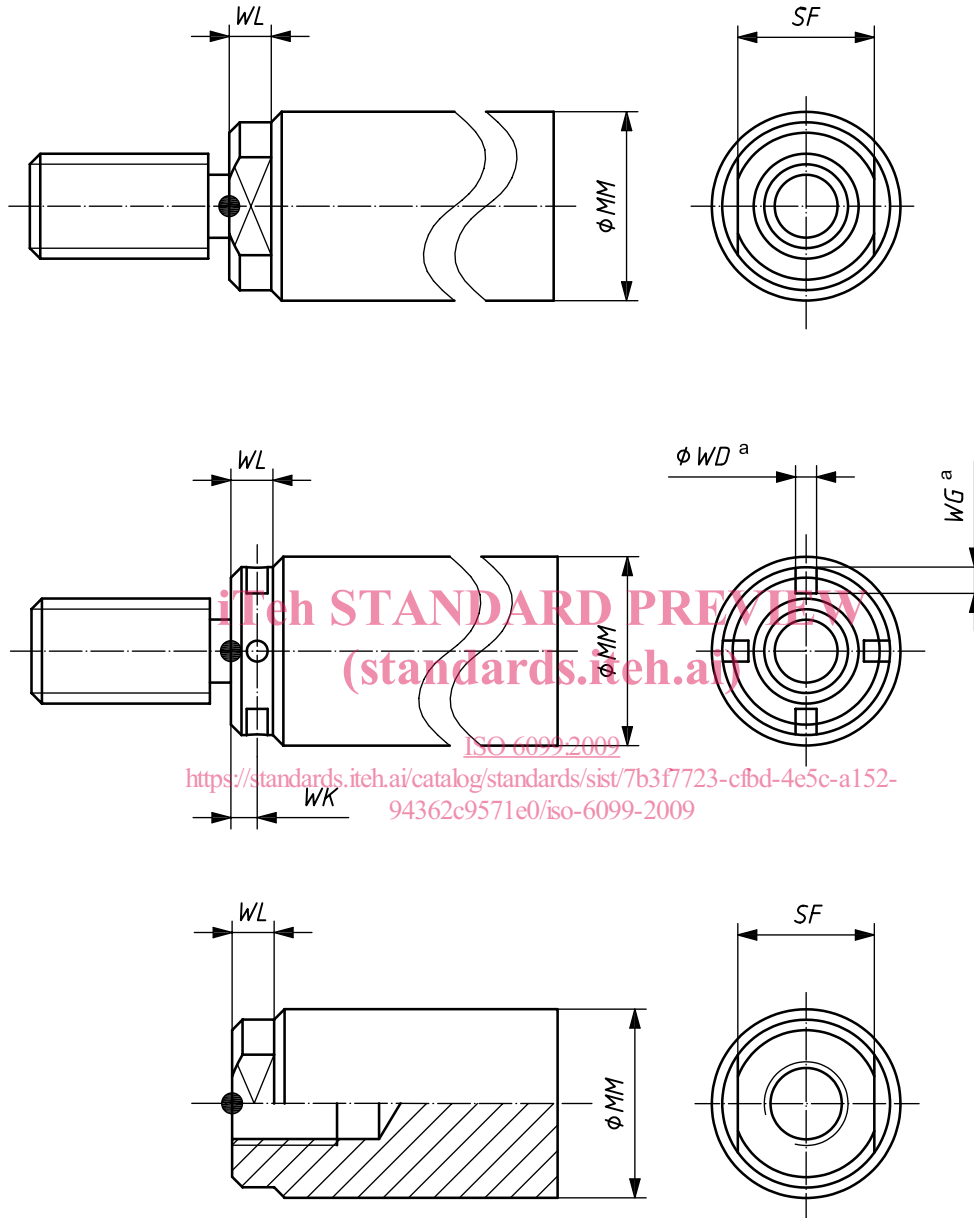
Figure 4 — RTM₁ Male threaded rod end

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4.1.6 Wrench flat piston rod end or hook wrench holes

For a wrench flat piston rod end or hook wrench holes, the reference point is located on the wrench flat or hook wrench holes, centreline and the piston rod centreline. See Figure 5.



^a Optional.

Figure 5 — Wrench flat piston rod end or hook wrench holes

4.1.7 Flanged piston rod end — Alternative reference points

For a flanged piston rod end, the reference point is either located on the rod centreline at the end of the piston rod (see Figure 6) or on the rod centreline at the shoulder level (see Figure 7).

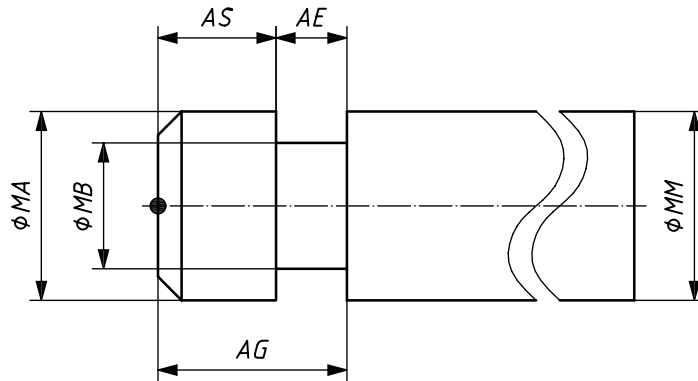


Figure 6 — RFE_x: Flanged piston rod end with TRP at the end of the piston rod

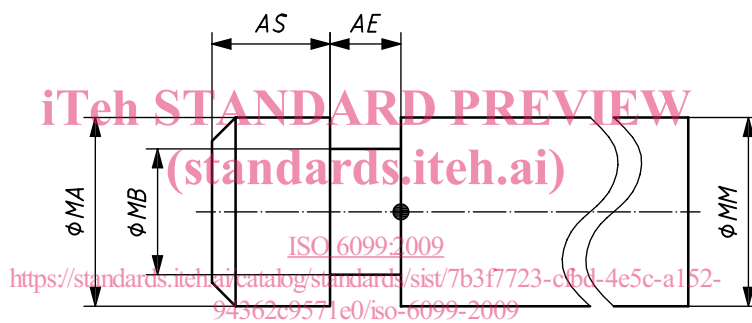


Figure 7 — RFS_x: Flanged piston rod end with TRP at the shoulder level

4.2 Identification code

The identification code for the rod end types is given in Table 1.

Table 1 — Identification code

Identification code	Description
RTM _x	Male threaded rod end
RTF _x	Female threaded rod end
RPE _x	Plain rod end
RPR _x	Pin rod end
RFE _x	Flanged piston rod end with TRP at the end of the piston rod
RFS _x	Flanged piston rod end with TRP at the shoulder level
x	Is designated for the wrench flats or hook wrench: 0 = none 1 = wrench flats 2 = hook wrench

5 Letter code for identifying cylinder mounting, envelope and accessory dimensions

5.1 General

The code for identifying cylinder mounting, envelope and accessory dimensions is composed of one or two letters and, in some cases, the signs: +, ++ or +/.

The meaning of these letters and signs is given in 5.2 to 5.5.

5.2 Letter *Z*

Any group of two letters beginning with *Z* identifies a longitudinal envelope dimension.

5.3 Letter *U*

Any group of two letters beginning with *U* identifies an end view envelope dimension.

5.4 Letters *W, X, Y, Z*

Any group of two letters beginning with *W, X, Y* or *Z* identifies a dimension end from the reference point.

5.5 Signs

The sign + after letters means that the stroke is to be added:

$ZJ + = ZJ$ plus stroke.

The sign ++ after letters means that twice the stroke is to be added:

$ZM ++ = ZM$ plus twice the stroke.

The sign +/ after letters means that half the stroke is to be added:

$XV +/ = XV$ plus half the stroke.

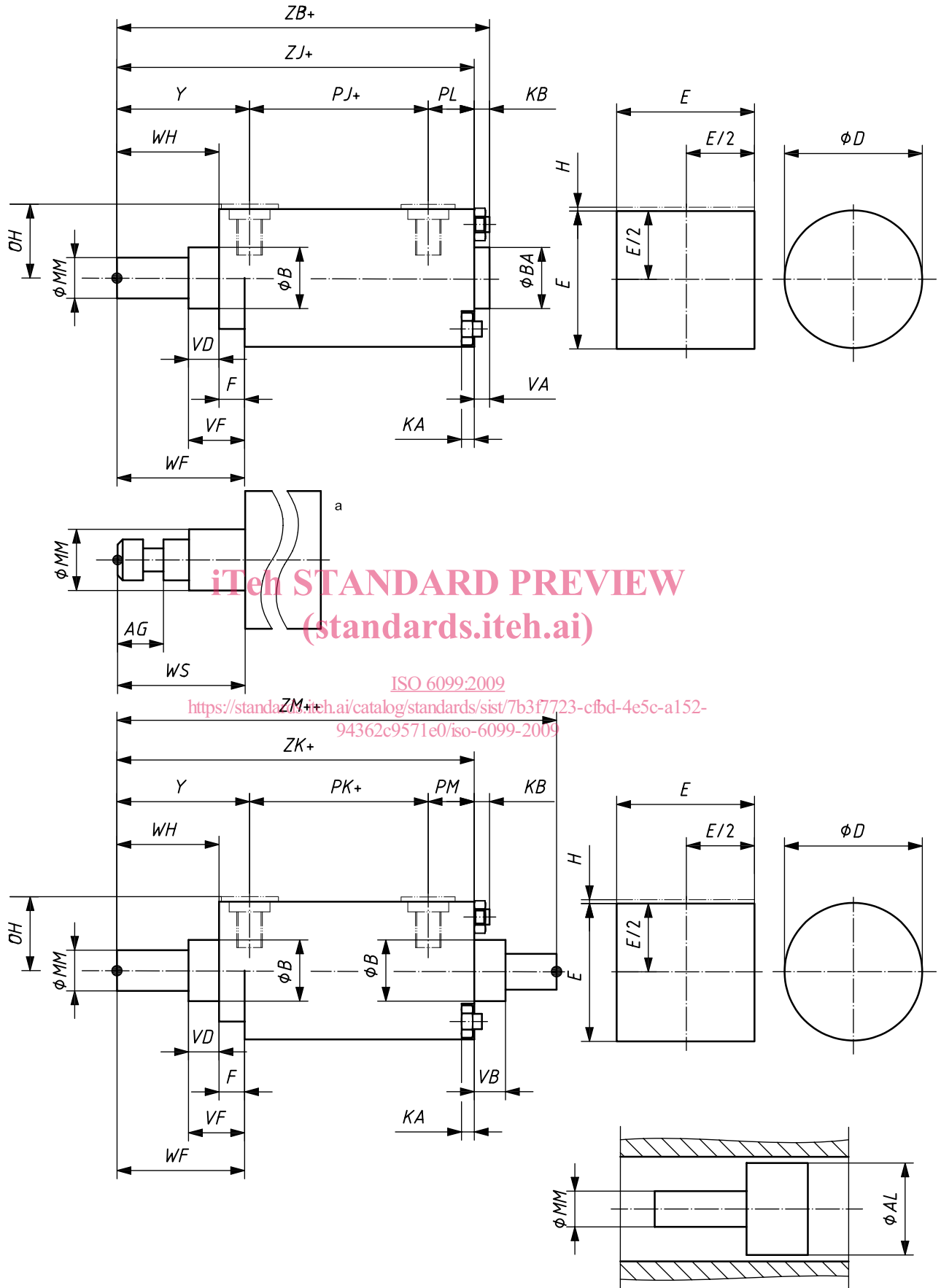
5.6 Dimensioning

The general dimensions are shown in Figure 8.

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a Refer to Figure 6.

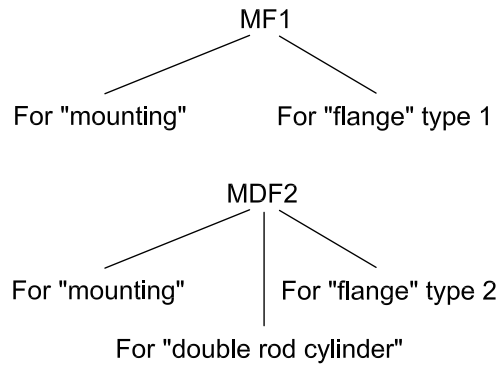
Figure 8 — Arrangement of general cylinder dimensions

6 Identification code for mounting types

6.1 General

The identification code for cylinder mounting types consists of two or three letters and a number.

EXAMPLE



The following letters may be used in place of the letter designating flanges used in the above examples.

Letter	Mounting type
B	body
E	cap or head
F	flange (detachable)
P	pivot
R	threaded nose
S	foot or lugs
T	trunnion
X	studs or tie rods

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6.2 Mounting types

The mounting types defined in this International Standard are given with their identifying code in Table 2.

Table 2 — Mounting types

Identification code	Description	Figure
MB 1	Body, through bolt hole	9
MDB 1	Body, through bolt hole — Double rod	10
MB 2	Round, through bolt hole	11
MDB 2	Round, through bolt hole — Double rod	12
ME 5	Head, rectangular	13
MDE 5	Head, rectangular — Double rod	14
ME 6	Cap, rectangular	15
ME 7	Head, round	16
MDE 7	Head, round — Double rod	17
ME 8	Cap, round	18
ME 9	Head, square	19
MDE 9	Head, square — Double rod	20
ME 10	Cap, square	21
ME 11	Head, square	22
MDE 11	Head, square — Double rod	23
ME 12	Cap, square	24
MF 1	Head, rectangular flange	25
MDF 1	Head, rectangular flange — Double rod	26
MF 2	Cap, rectangular flange	27
MF 3	Head, circular flange	28
MDF 3	Head, circular flange — Double rod	29
MF 4	Cap, circular flange	30
MF 5	Head, square flange	31
MDF 5	Head, square flange — Double rod	32
MF 6	Cap, square flange	33
MF 7	Head, circular flange centred on the rear side	34
MDF 7	Head, circular flange centred on the rear side — Double rod	35
MF 8	Head, rectangular flange with two holes	36
MP 1	Cap, fixed clevis	37
MP 2	Cap, detachable clevis	38
MP 3	Cap, fixed plain eye	39
MP 4	Cap, detachable plain eye	40
MP 5	Cap, fixed eye with spherical bearing	41
MP 6	Cap, detachable eye with spherical bearing	42
MP 7	Head, detachable clevis	43
MR 3	Head, threaded	44
MDR 3	Head, threaded — Double rod	45
MR 4	Cap, threaded	46