
**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*

STANDARDSISO.COM : Click to view the full PDF of ISO 6099:2009



PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

STANDARDSISO.COM : Click to view the full PDF of ISO 6099:2009



COPYRIGHT PROTECTED DOCUMENT

© ISO 2009

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword.....	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions.....	1
4 Identification code for rod end types.....	1
4.1 Reference points and letter codes	1
4.1.1 General.....	1
4.1.2 Plain rod end	2
4.1.3 Pin rod end	2
4.1.4 Female threaded rod end	2
4.1.5 Male threaded rod end.....	3
4.1.6 Wrench flat piston rod end or hook wrench holes.....	4
4.1.7 Flanged piston rod end — Alternative reference points.....	5
4.2 Identification code	5
5 Letter code for identifying cylinder mounting, envelope and accessory dimensions	6
5.1 General.....	6
5.2 Letter <i>Z</i>	6
5.3 Letter <i>U</i>	6
5.4 Letters <i>W, X, Y, Z</i>.....	6
5.5 Signs	6
5.6 Dimensioning	6
6 Identification code for mounting types	8
6.1 General.....	8
6.2 Mounting types	8
6.3 Letter codes of mounting and envelope dimensions according to cylinder mounting type.....	11
7 Identification code for accessory types	36
7.1 General.....	36
7.2 Accessory types	37
7.3 Letter codes of accessories according to accessory type.....	38
8 Designation of the position of the ports in round and square types	45
9 Identification statement (Reference to this International Standard)	46

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.

STANDARDSISO.COM : Click to view the full PDF of ISO 6099:2009

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.

STANDARDSISO.COM : Click to view the full PDF of ISO 6099:2009

STANDARDSISO.COM : Click to view the full PDF of ISO 6099:2009

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*

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.

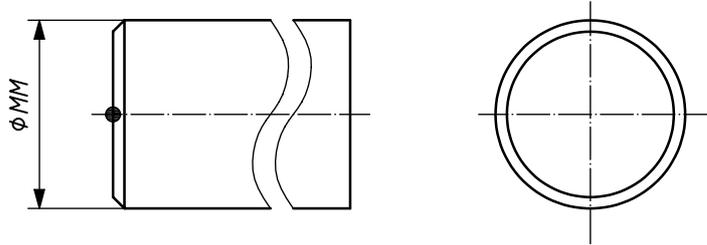


Figure 1 — RPE_x: Plain rod end

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.

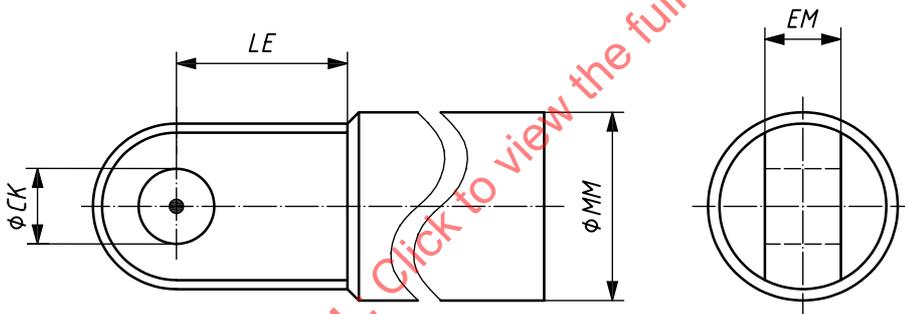


Figure 2 — RPR_x: Pin rod end

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.

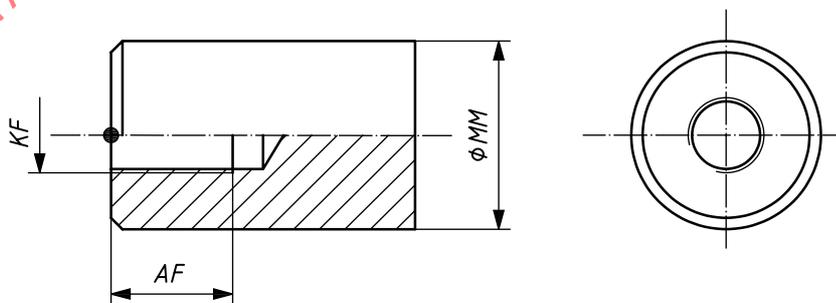


Figure 3 — RTF_x: Female threaded rod end

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.

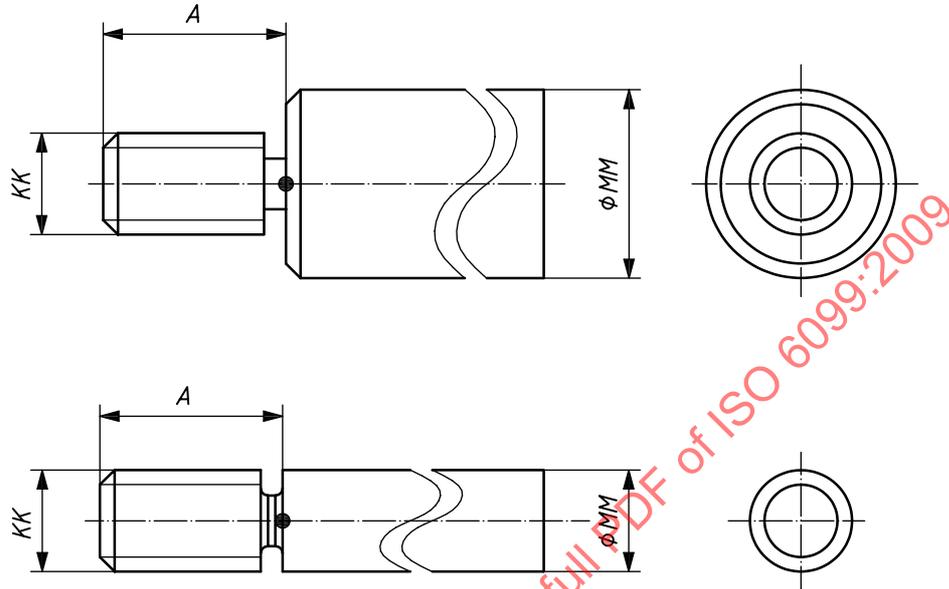
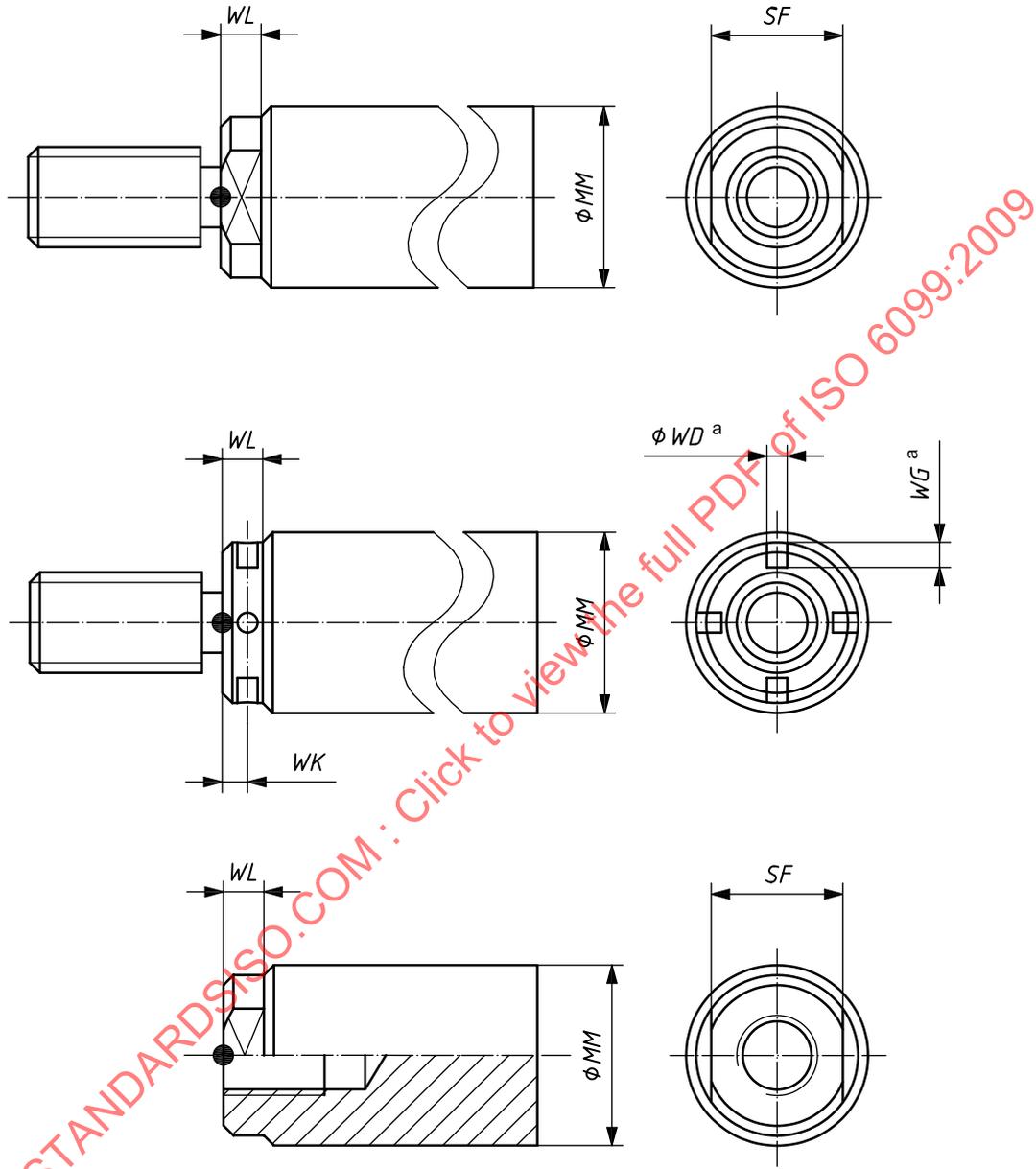


Figure 4 — RTM_x: Male threaded rod end

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).

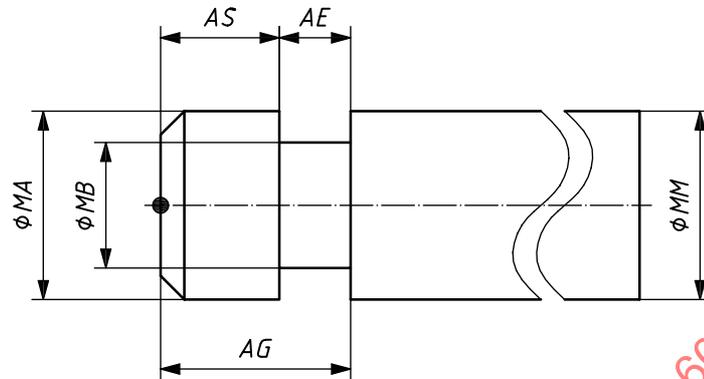


Figure 6 — RFE_x: Flanged piston rod end with TRP at the end of the piston rod

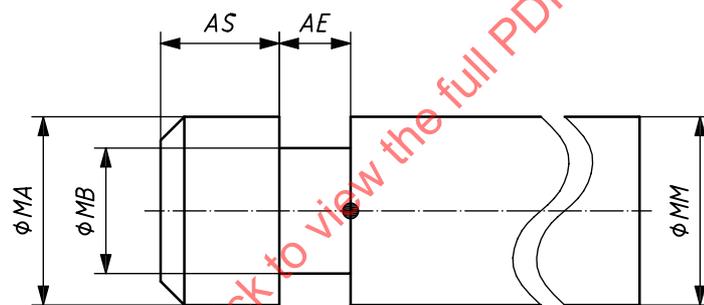


Figure 7 — RFS_x: Flanged piston rod end with TRP at the shoulder level

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:

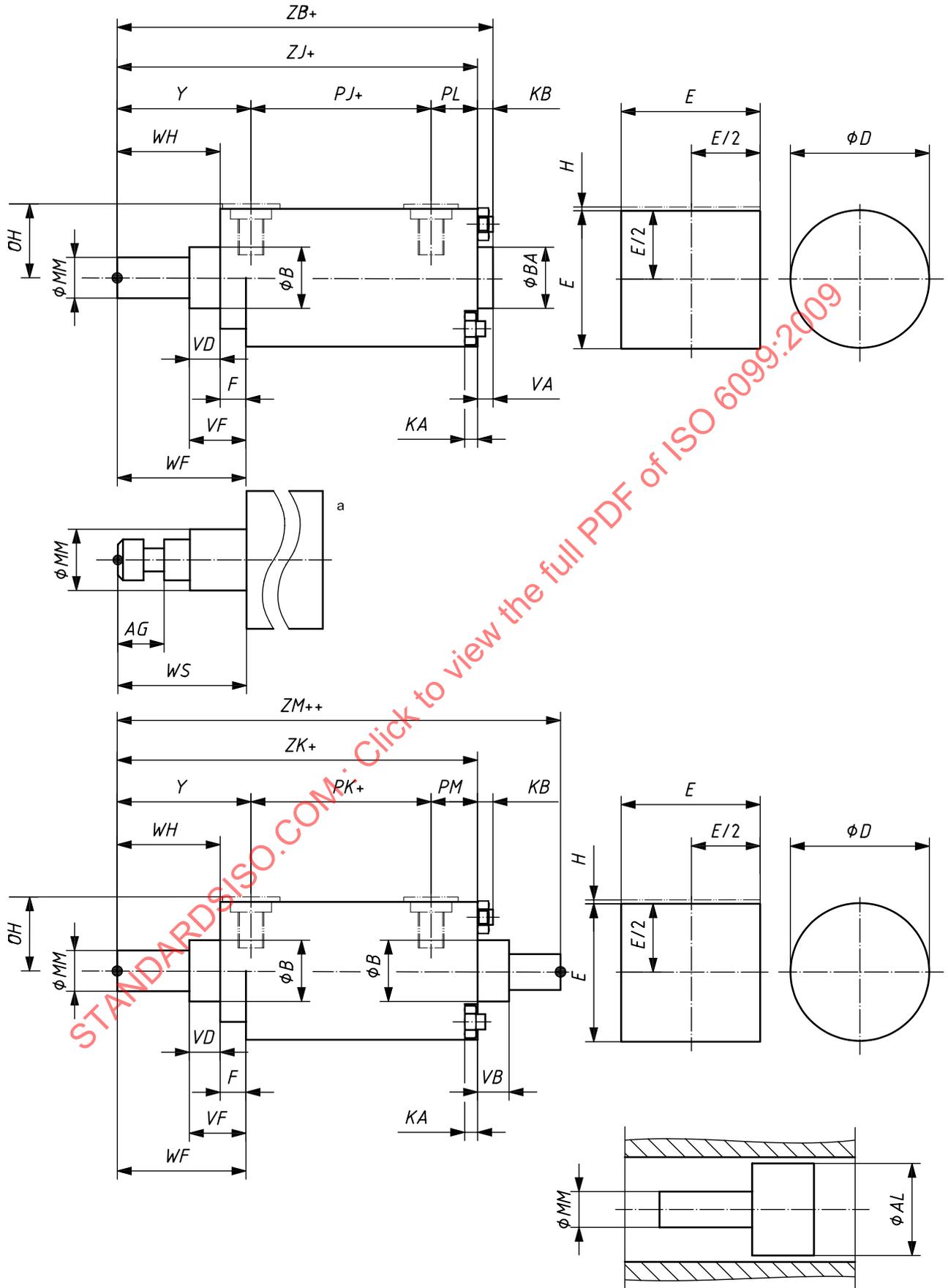
$ZM++ = ZM$ plus twice the stroke.

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.



a Refer to Figure 6.

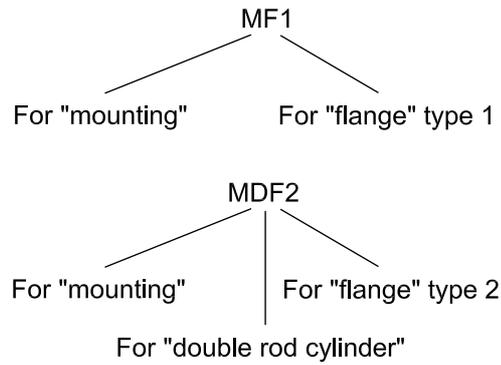
Figure 8 — Arrangement of general cylinder dimensions

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

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

Table 2 (continued)

Identification code	Description	Figure
MS 1	End angles	47
MDS 1	End angles — Double rod	48
MS 2	Side lugs	49
MDS 2	Side lugs — Double rod	50
MS 3	Head angle	51
MT 1	Head, integral trunnion (male)	52
MDT 1	Head, integral trunnion (male) — Double rod	53
MT 2	Cap, integral trunnion (male)	54
MT 4	Intermediate trunnion (male) fixed or mobile	55
MDT 4	Intermediate trunnion (male) fixed or mobile — Double rod	56
MT 5	Head, detachable trunnion (male)	57
MT 6	Cap, detachable trunnion (male)	58
MX 1	Both ends studs or tie rods extended	59
MDX 1	Both ends studs or tie rods extended — Double rod	60
MX 2	Cap studs or tie rods extended	61
MDX 2	Cap studs or tie rods extended — Double rod	62
MX 3	Head studs or tie rods extended	63
MX 4	Both ends 2 studs or tie rods extended	64
MDX 4	Both ends 2 studs or tie rods extended — Double rod	65
MX 5	Head, tapped	66
MDX 5	Head, tapped — Double rod	67
MX 6	Cap, tapped	68
MX 7	Head, tapped, and cap studs or tie rods extended	69
MDX 7	Head, tapped, and cap studs or tie rods extended — Double rod	70
MX 8	Head and cap, tapped	71
MDX 8	Head and cap, tapped — Double rod	72

6.3 Letter codes of mounting and envelope dimensions according to cylinder mounting type

The letter code for mounting and envelope dimensions according to cylinder mounting type is shown in Figure 9 to Figure 72, and the designation is given in Table 4.

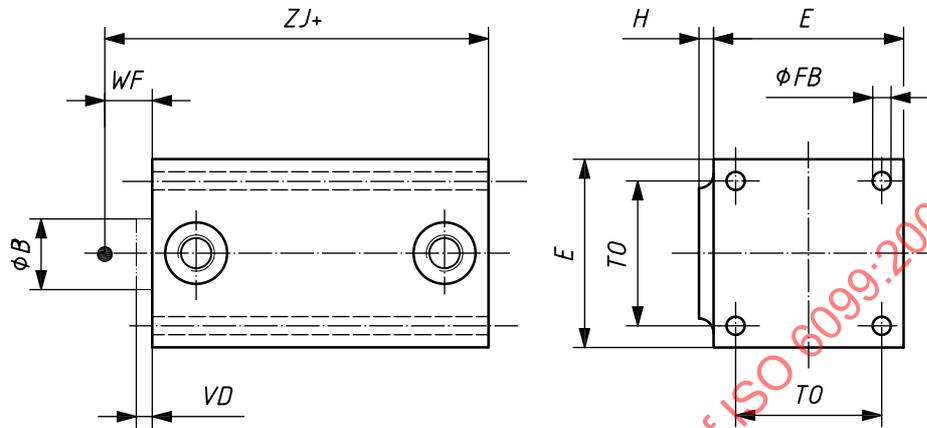


Figure 9 — MB 1: Body, through bolt hole

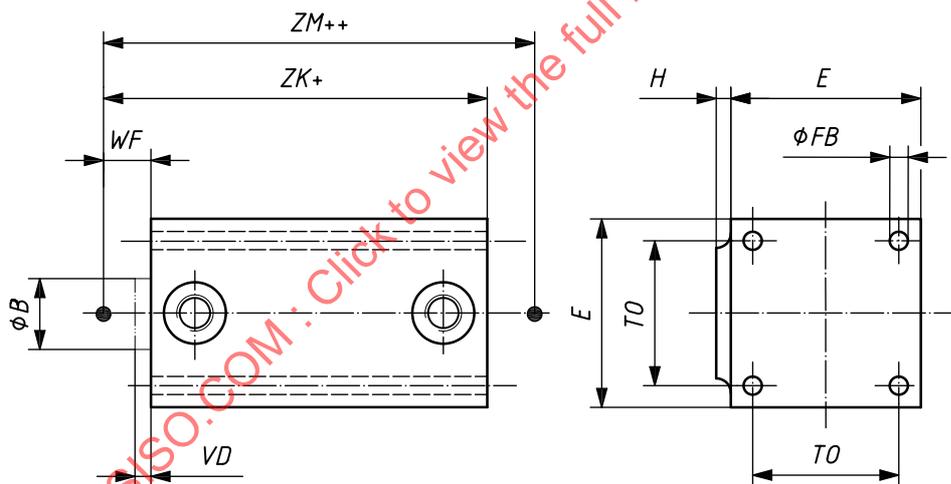


Figure 10 — MDB 1: Body, through bolt hole — Double rod

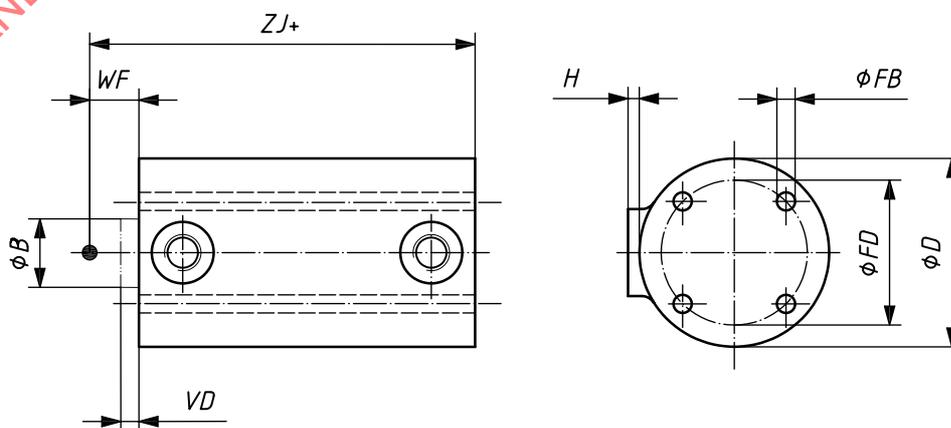


Figure 11 — MB 2: Round, through bolt hole

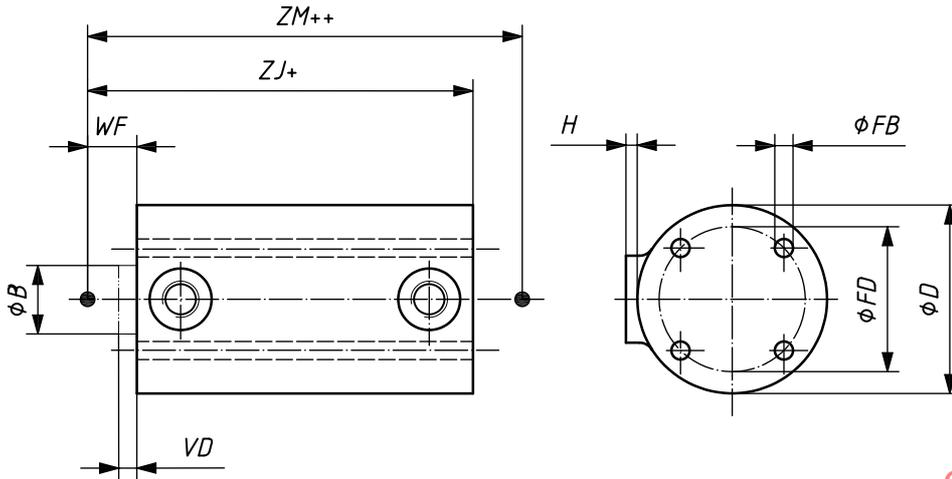


Figure 12 — MDB 2: Round, through bolt hole — Double rod

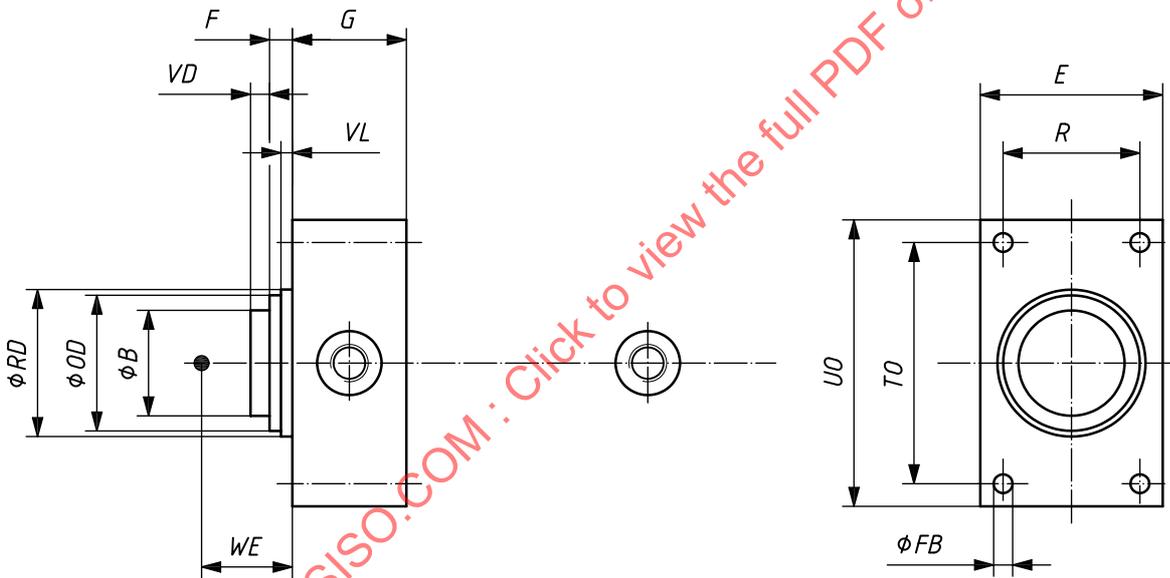


Figure 13 — ME 5: Head, rectangular

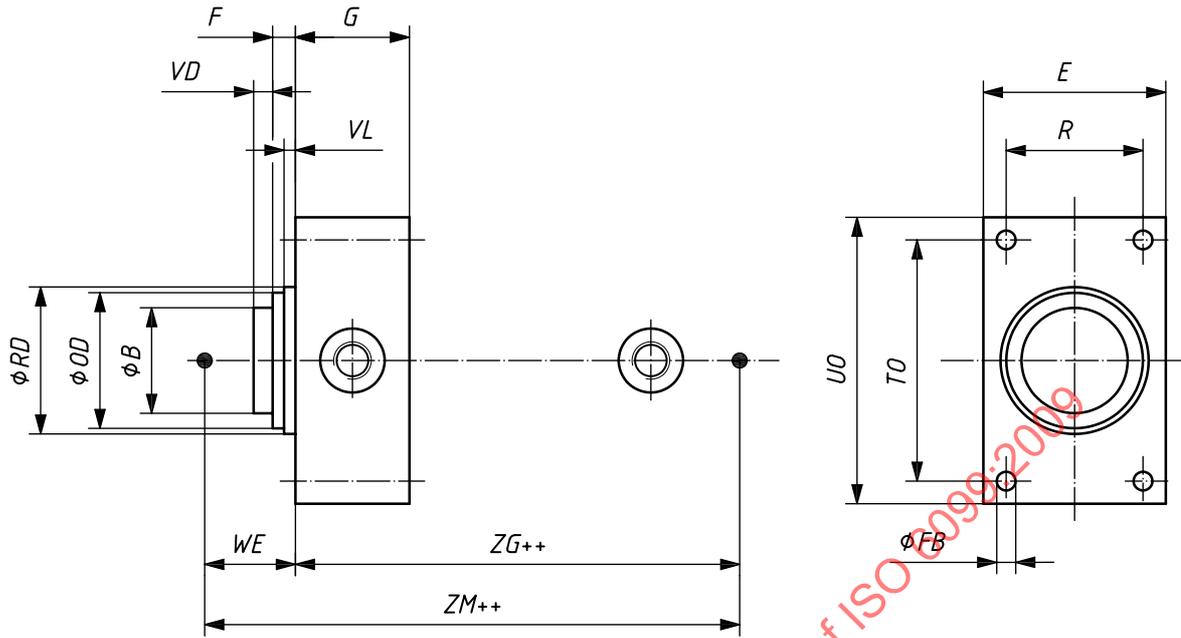


Figure 14 — MDE 5: Head, rectangular — Double rod

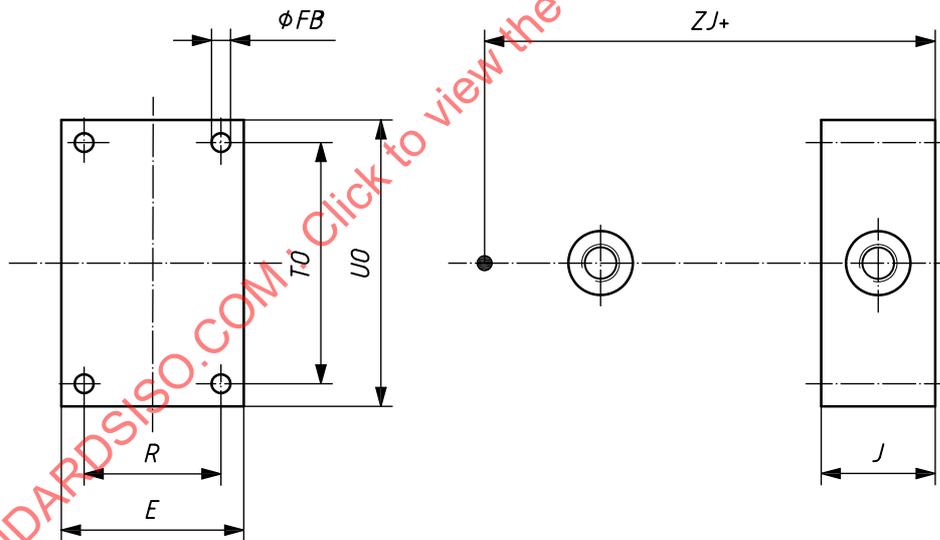


Figure 15 — ME 6: Cap, rectangular

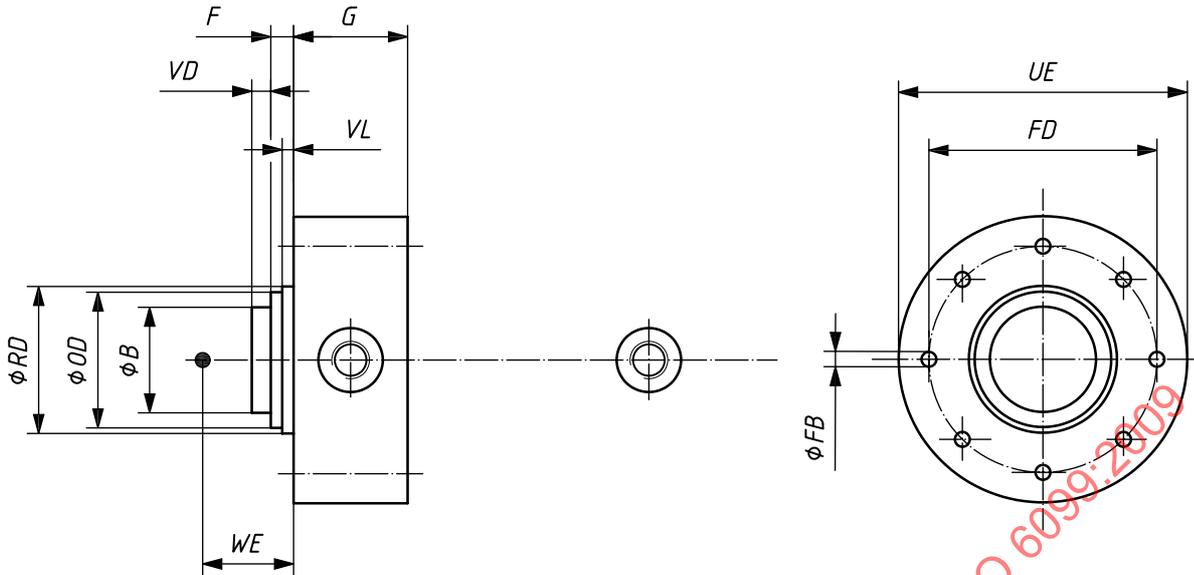


Figure 16 — ME 7: Head, round

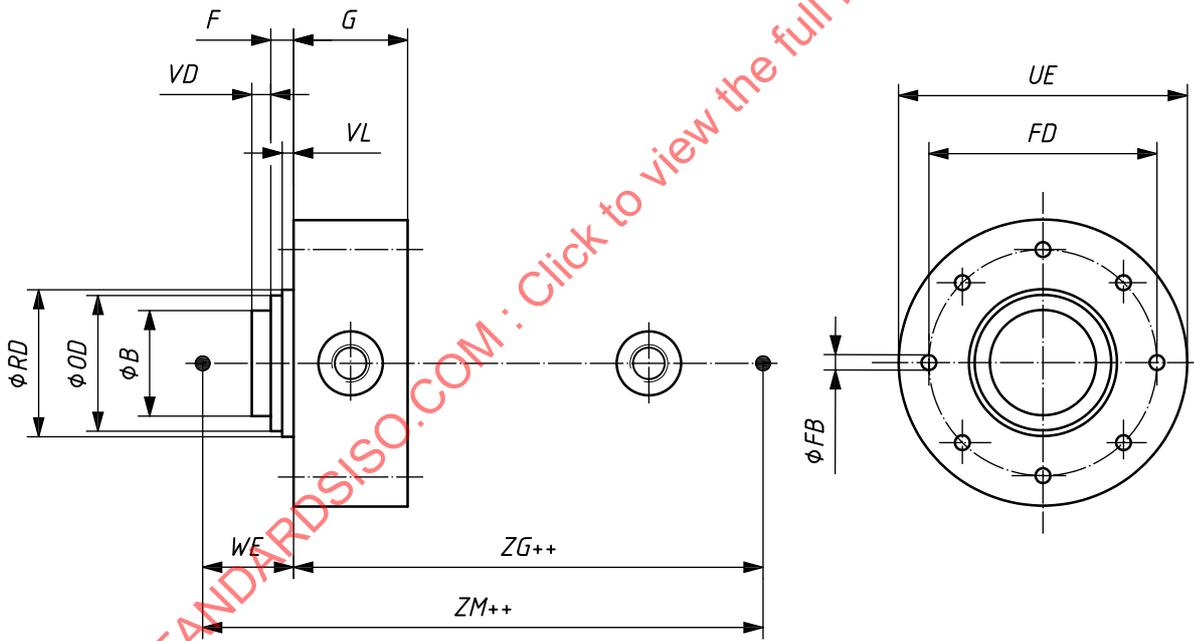


Figure 17 — MDE 7: Head, round — Double rod

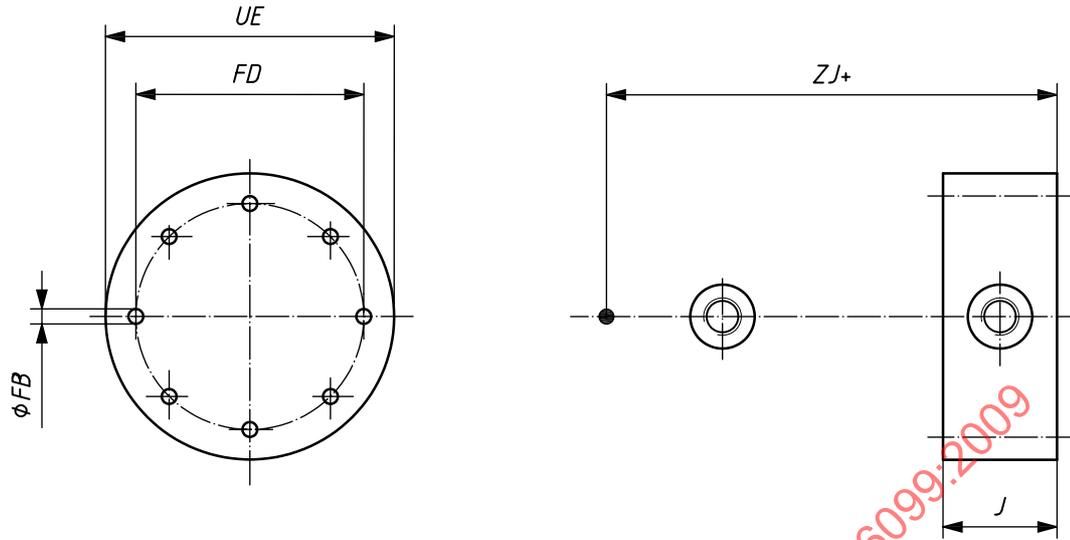


Figure 18 — ME 8: Cap, round

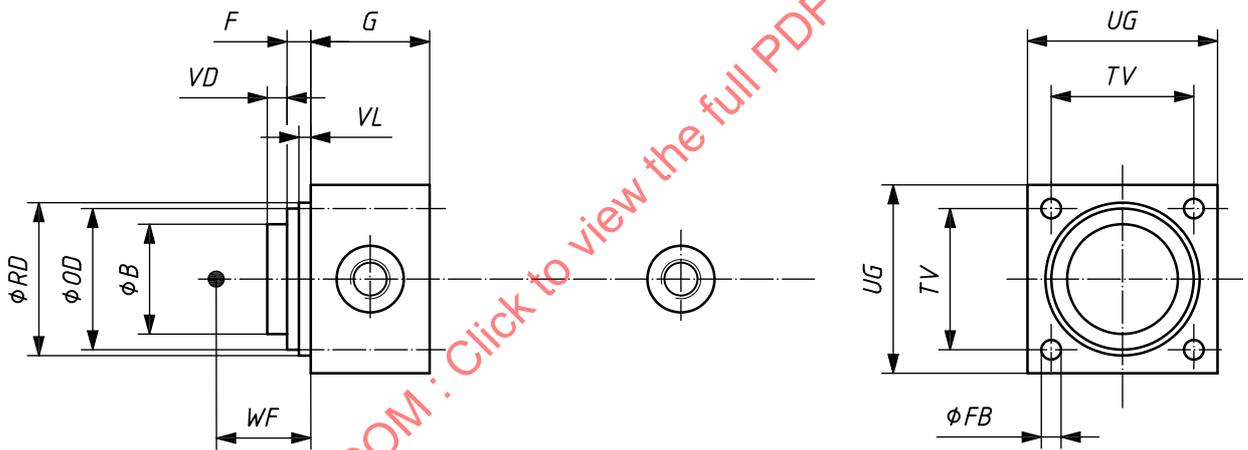


Figure 19 — ME 9: Head, square

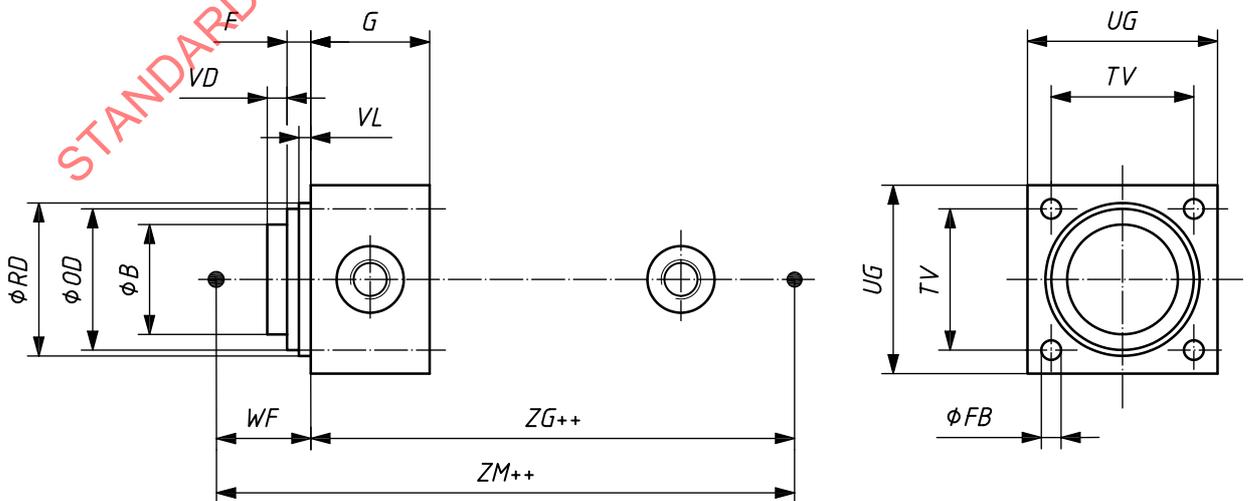


Figure 20 — MDE 9: Head, square — Double rod

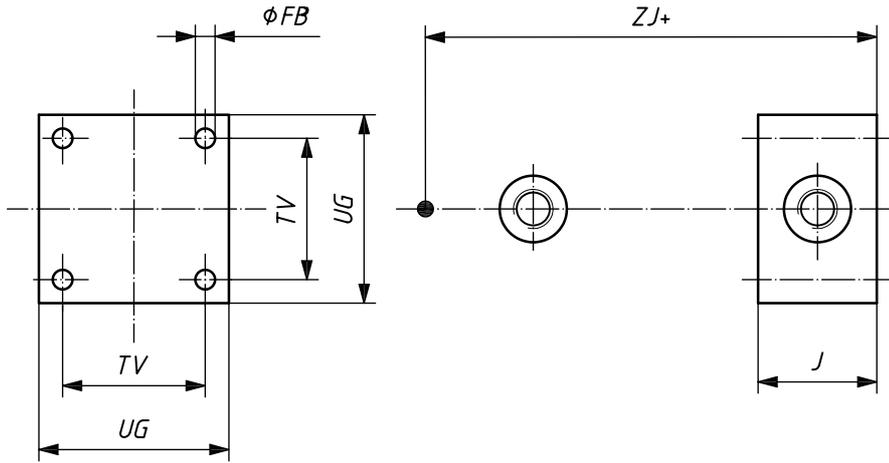


Figure 21 — ME 10: Cap, square

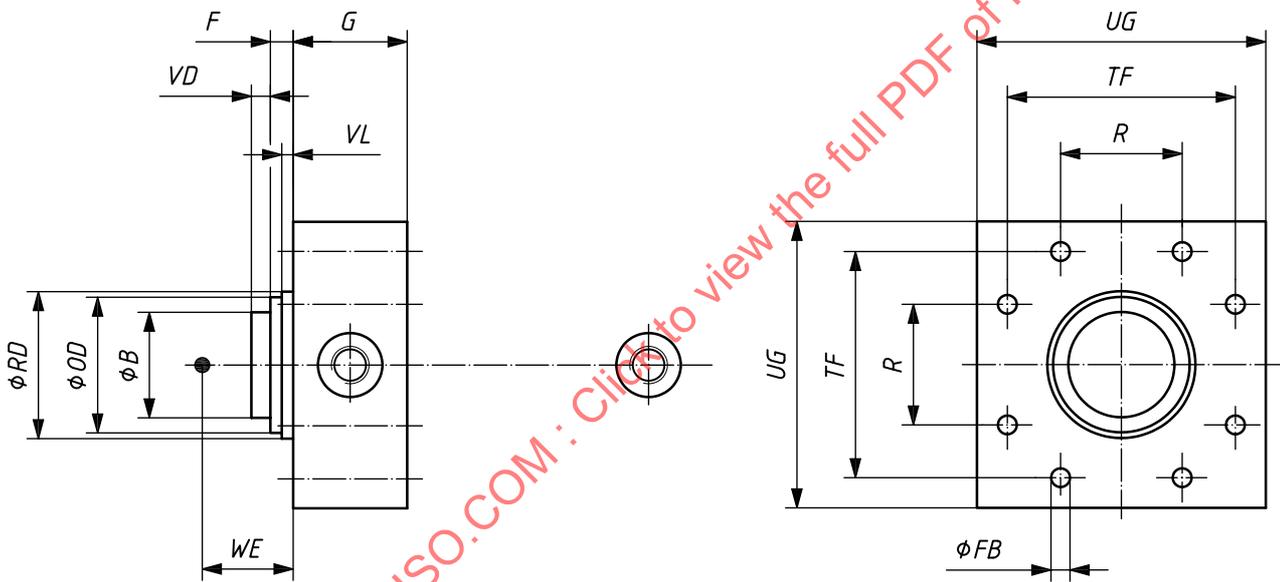


Figure 22 — ME 11: Head, square

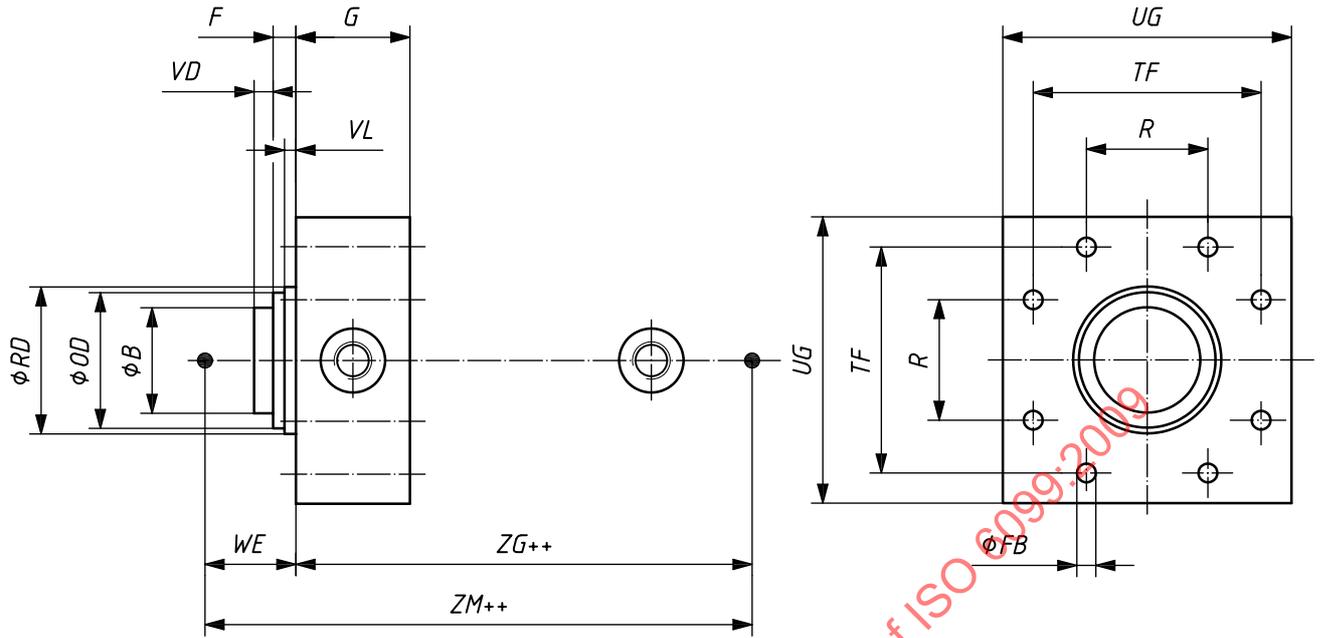


Figure 23 — MDE 11: Head, square — Double rod

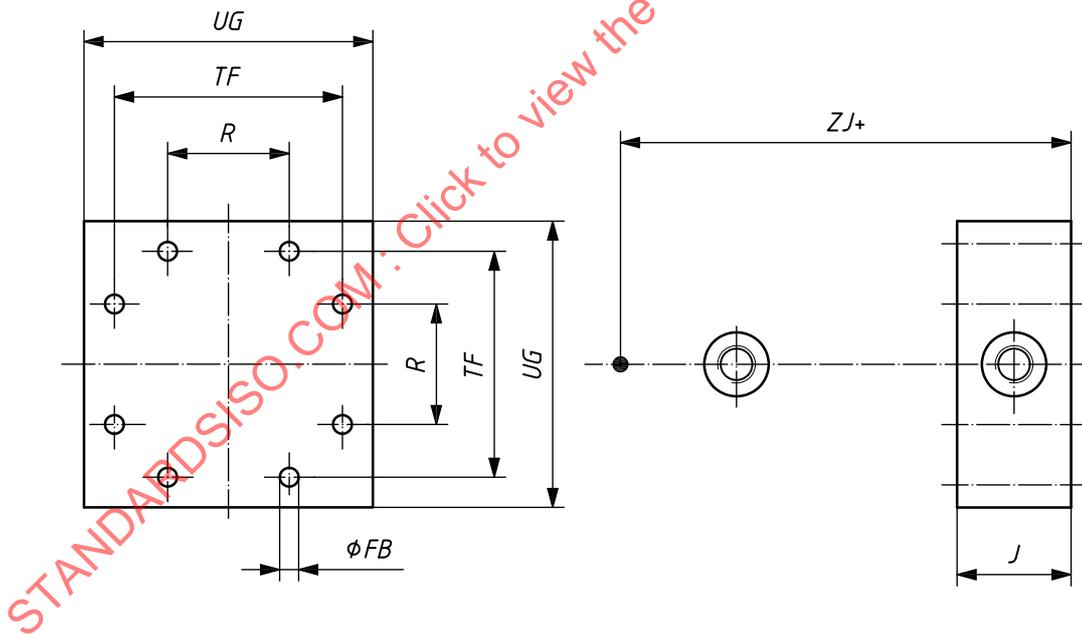


Figure 24 — ME 12: Cap, square

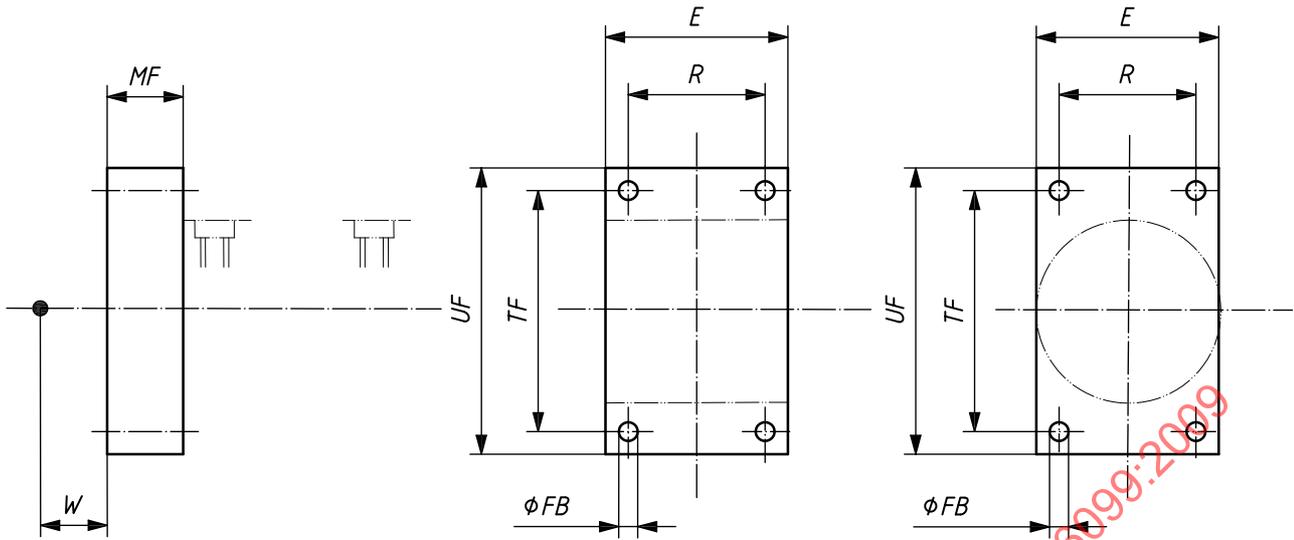


Figure 25 — MF 1: Head, rectangular flange

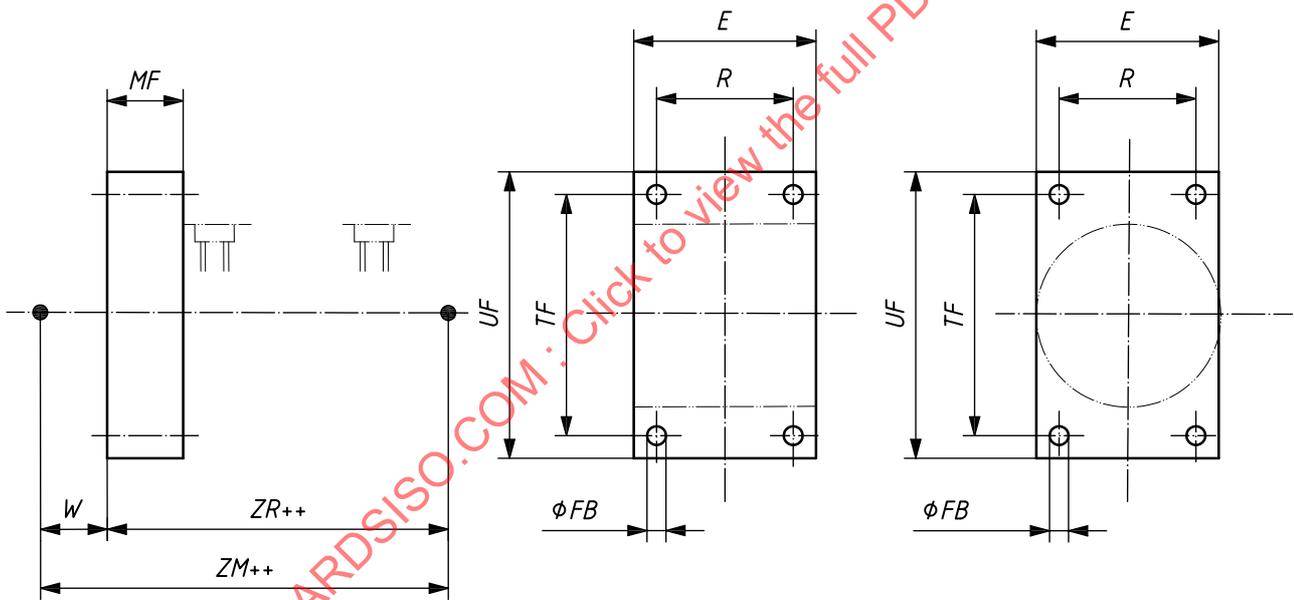


Figure 26 — MDF 1: Head, rectangular flange — Double rod

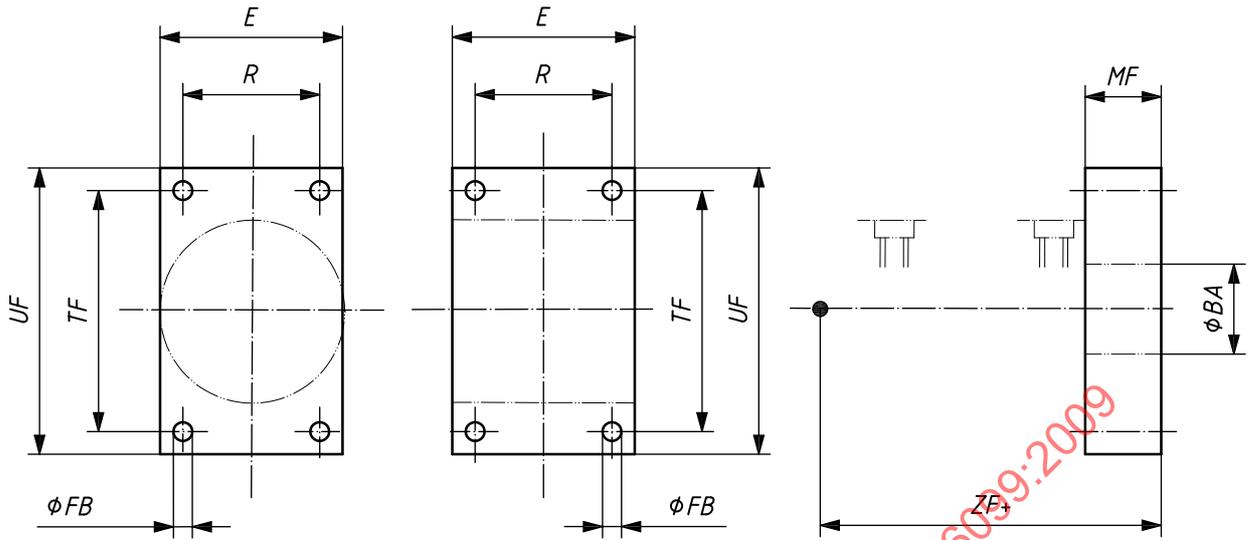


Figure 27 — MF 2: Cap, rectangular flange

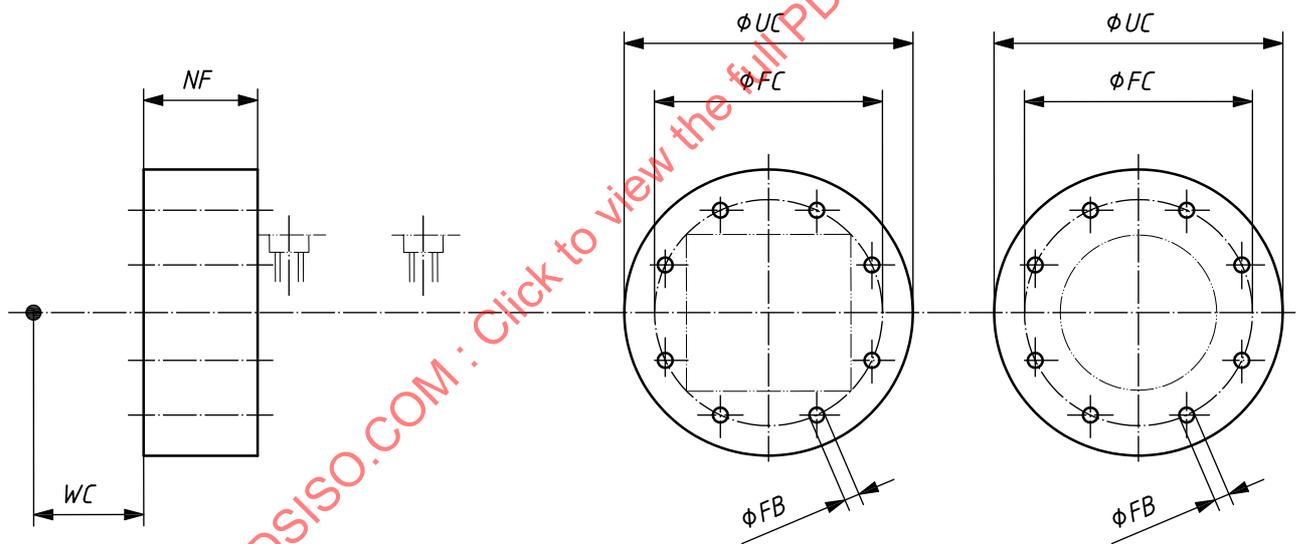


Figure 28 — MF 3: Head, circular flange

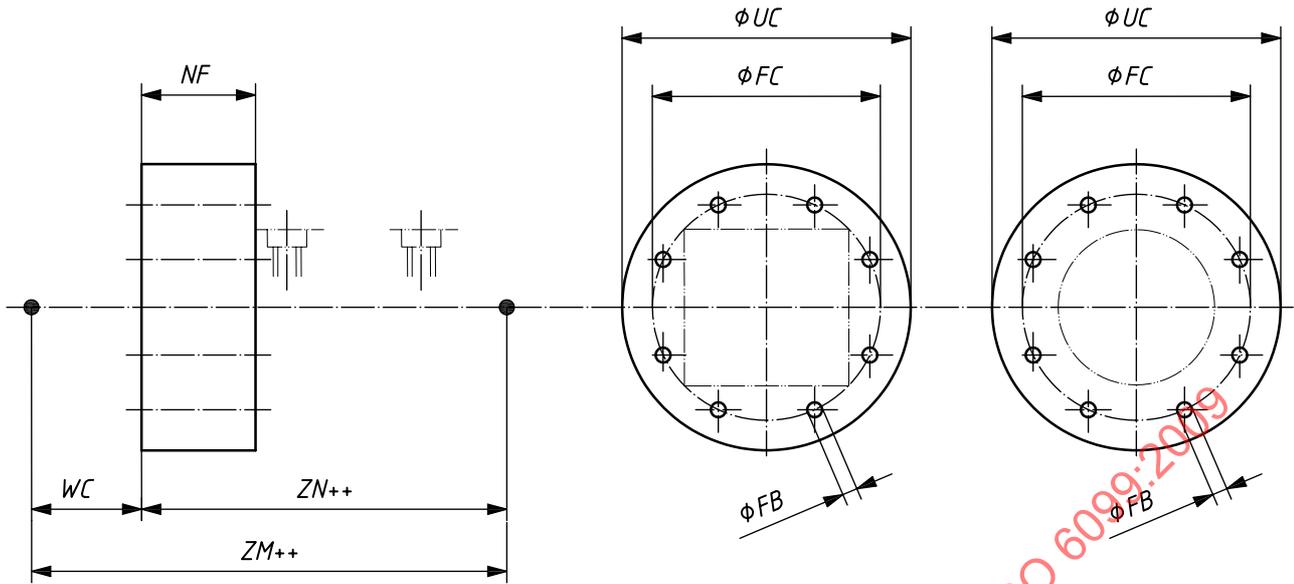


Figure 29 — MDF 3: Head, circular flange — Double rod

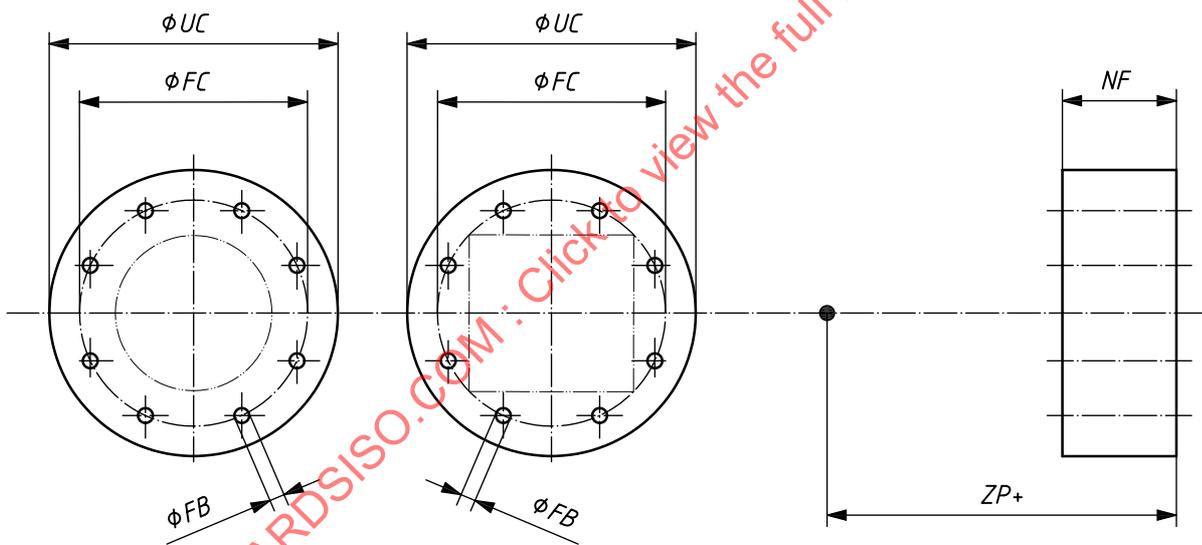


Figure 30 — MF 4: Cap, circular flange

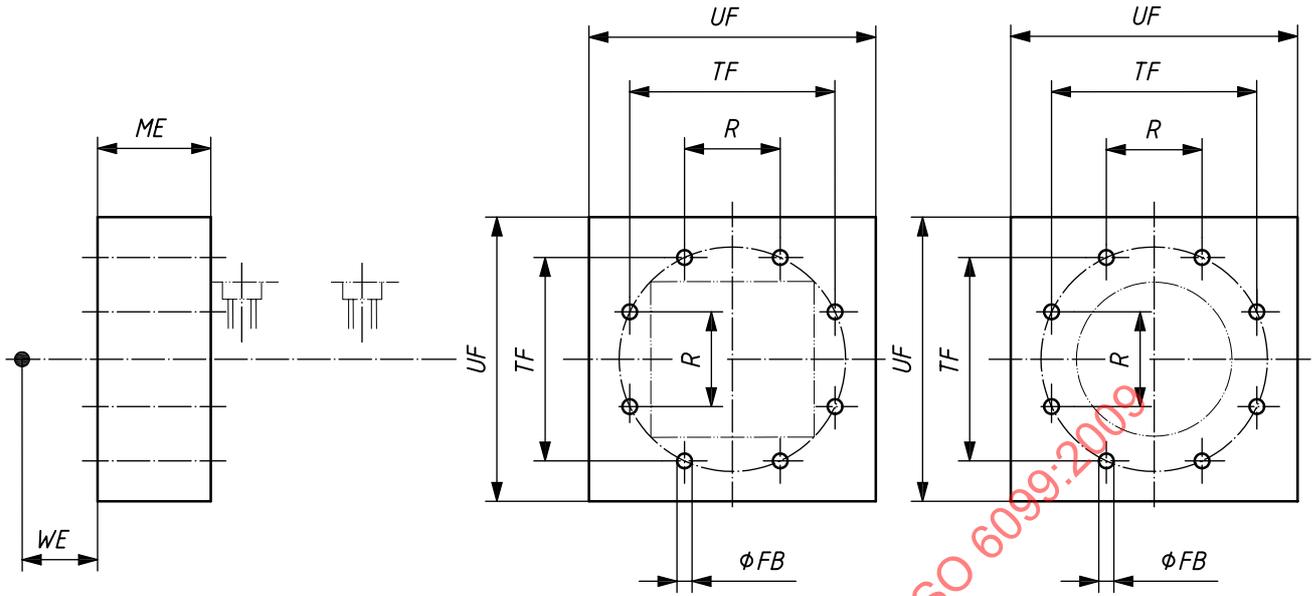


Figure 31 — MF 5: Head, square flange

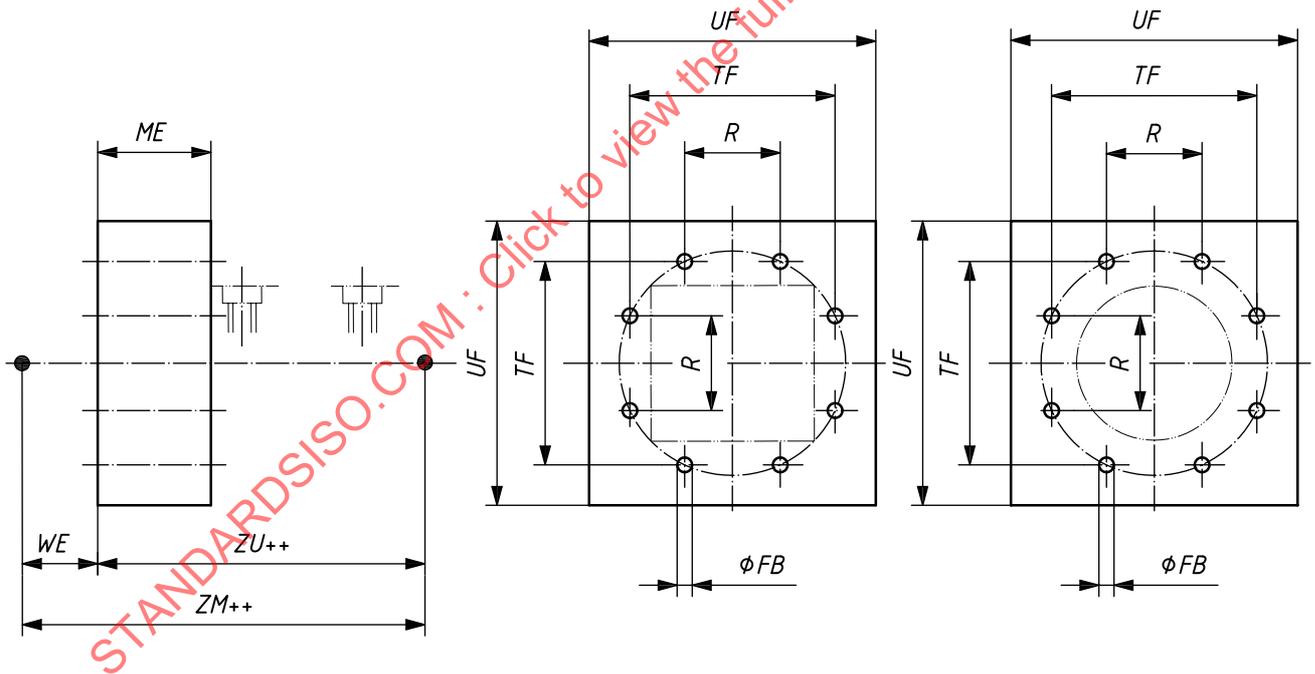


Figure 32 — MDF 5: Head, square flange — Double rod

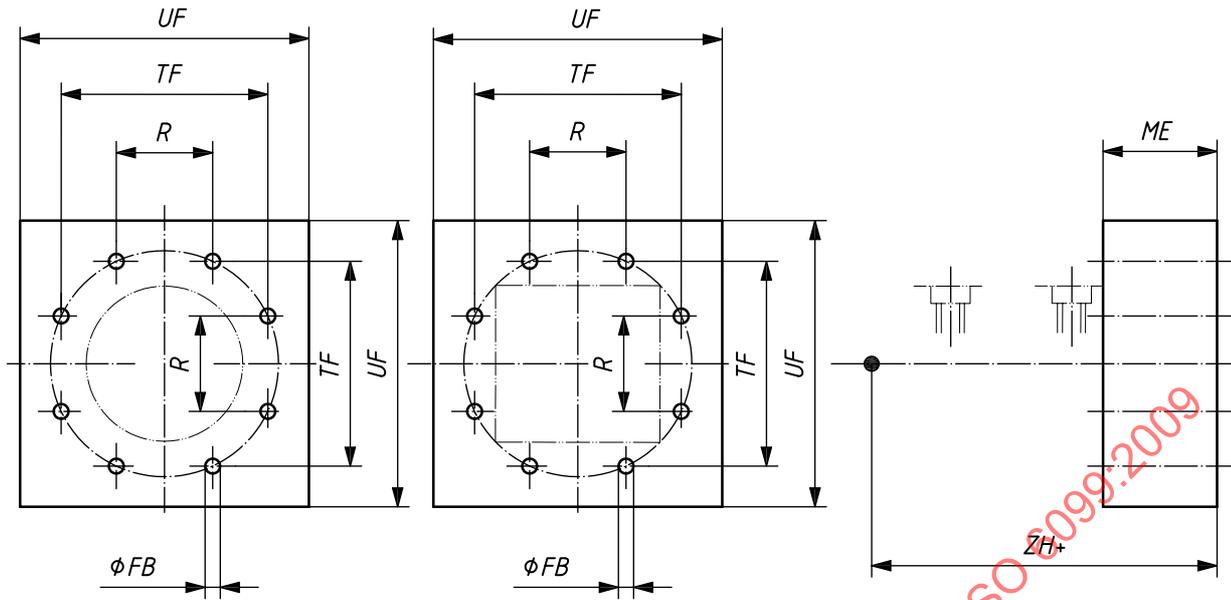


Figure 33 — MF 6: Cap, square flange

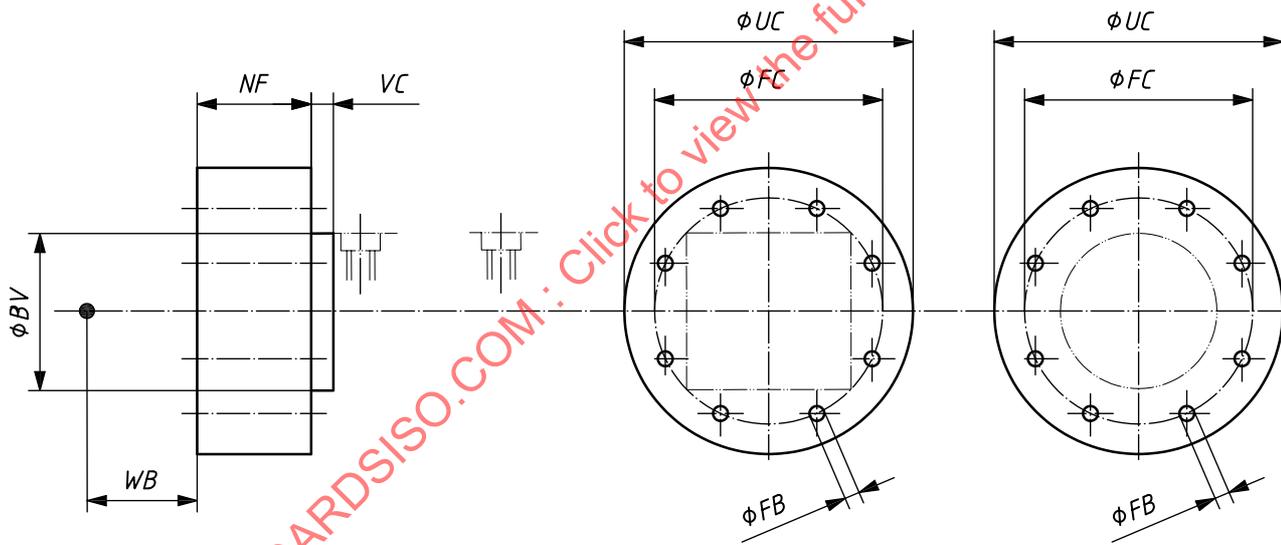


Figure 34 — MF 7: Head, circular flange centred on the rear side

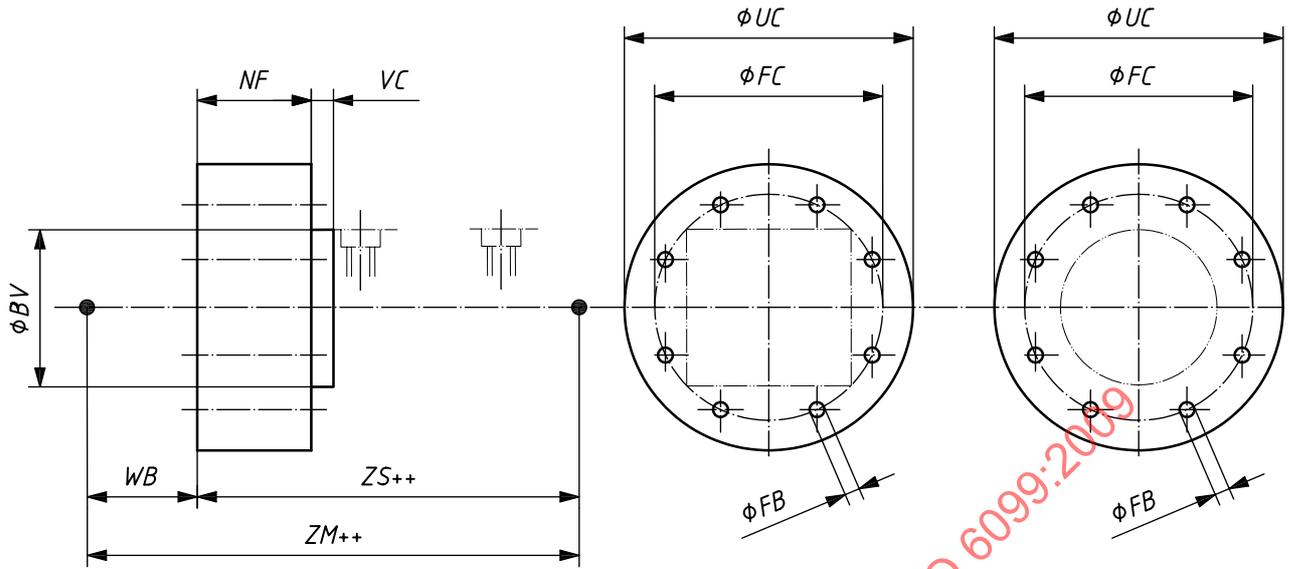


Figure 35 — MDF 7: Head, circular flange centred on the rear side — Double rod

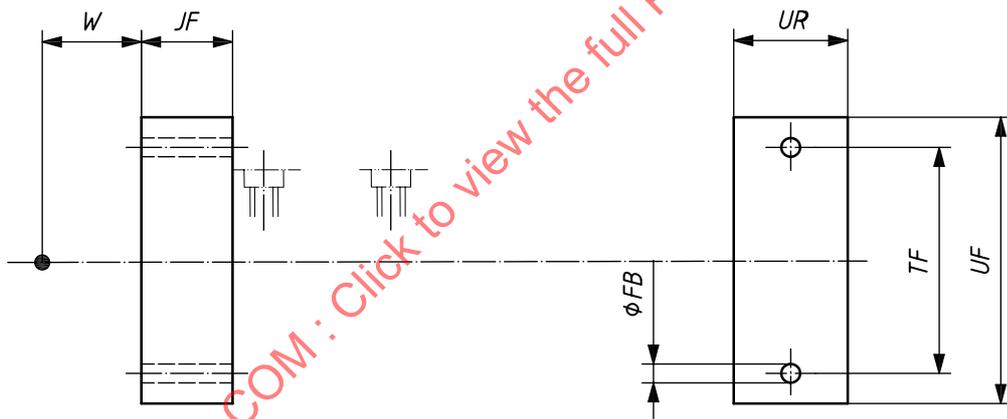


Figure 36 — MF 8: Head, rectangular flange with two holes

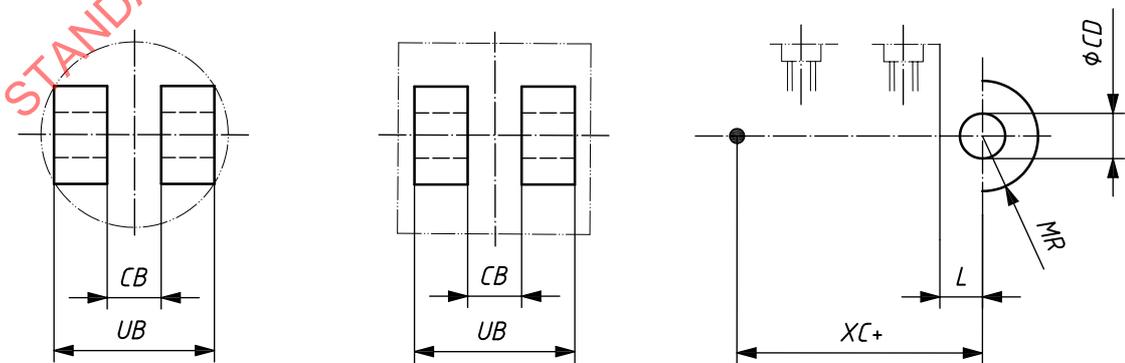


Figure 37 — MP 1: Cap, fixed clevis

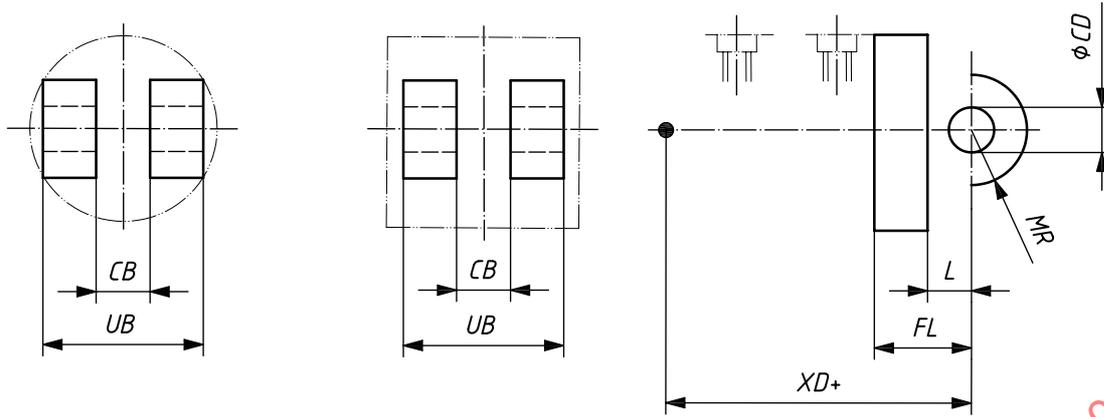


Figure 38 — MP 2: Cap, detachable clevis

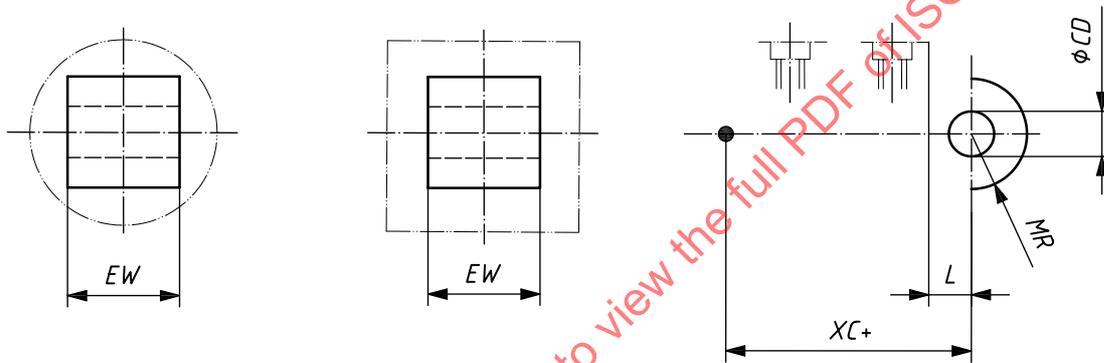


Figure 39 — MP 3: Cap, fixed plain eye

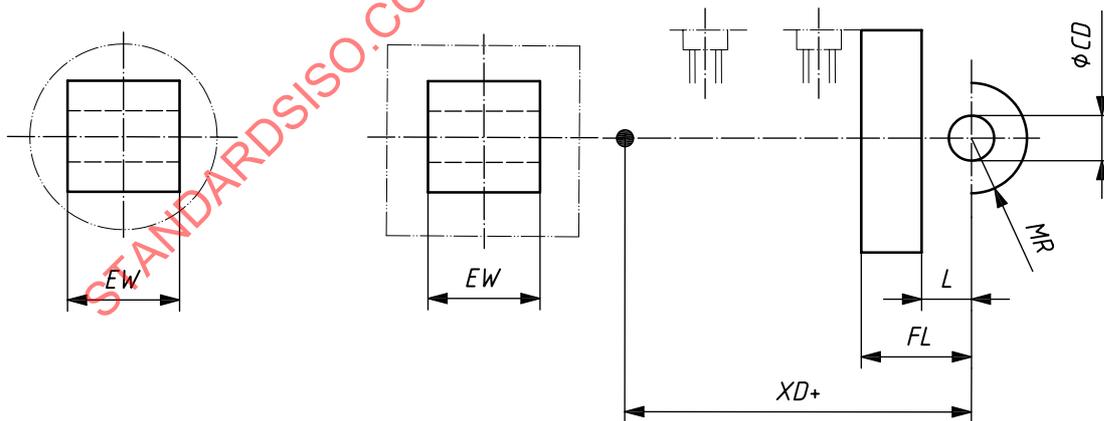


Figure 40 — MP 4: Cap, detachable plain eye

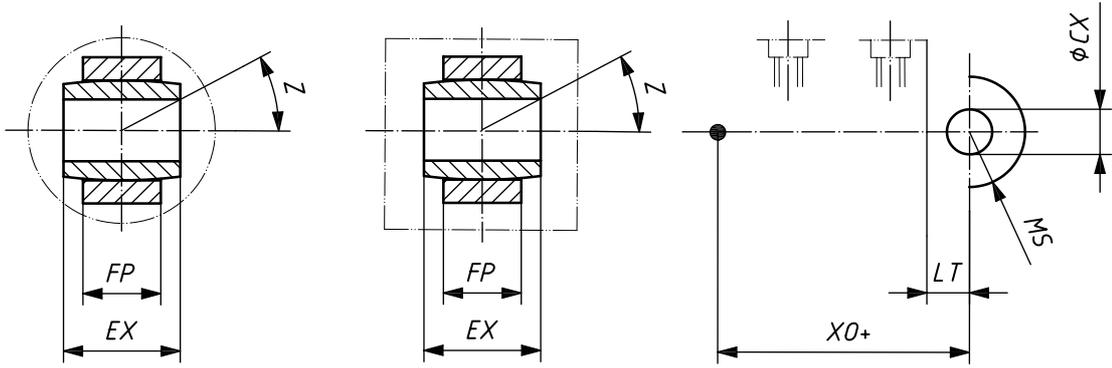


Figure 41 — MP 5: Cap, fixed eye with spherical bearing

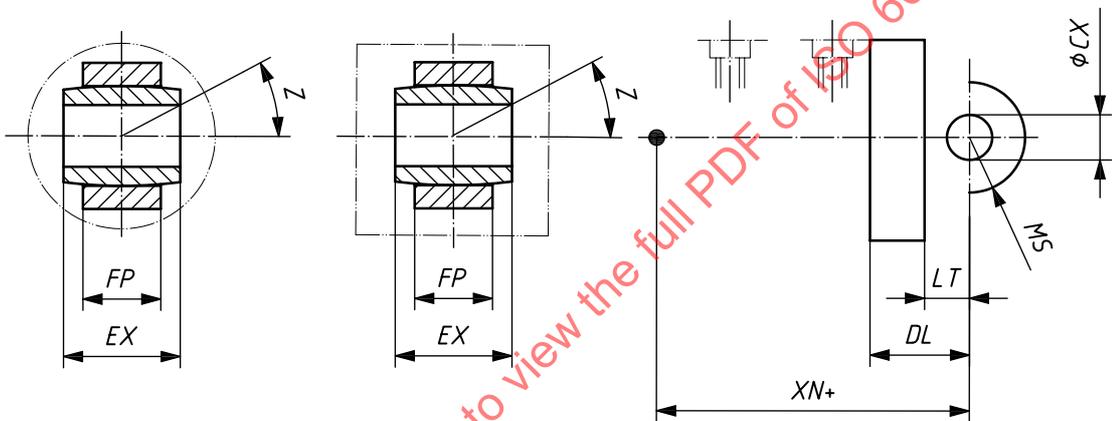


Figure 42 — MP 6: Cap, detachable eye with spherical bearing

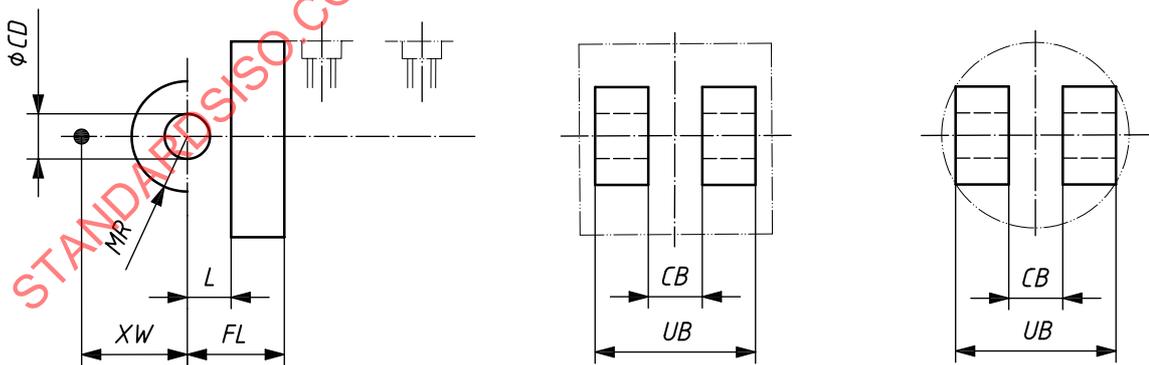


Figure 43 — MP 7: Head, detachable clevis

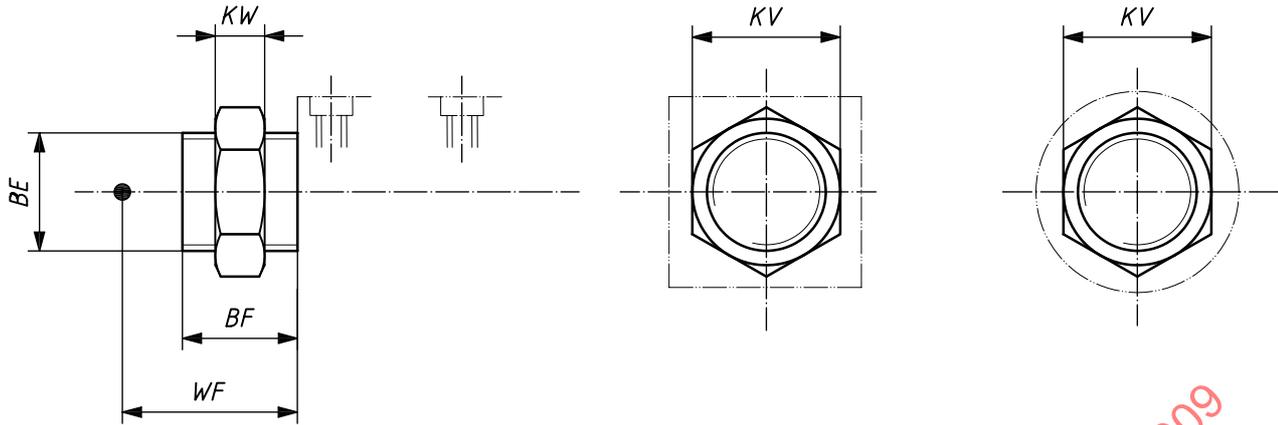


Figure 44 — MR 3: Head, threaded

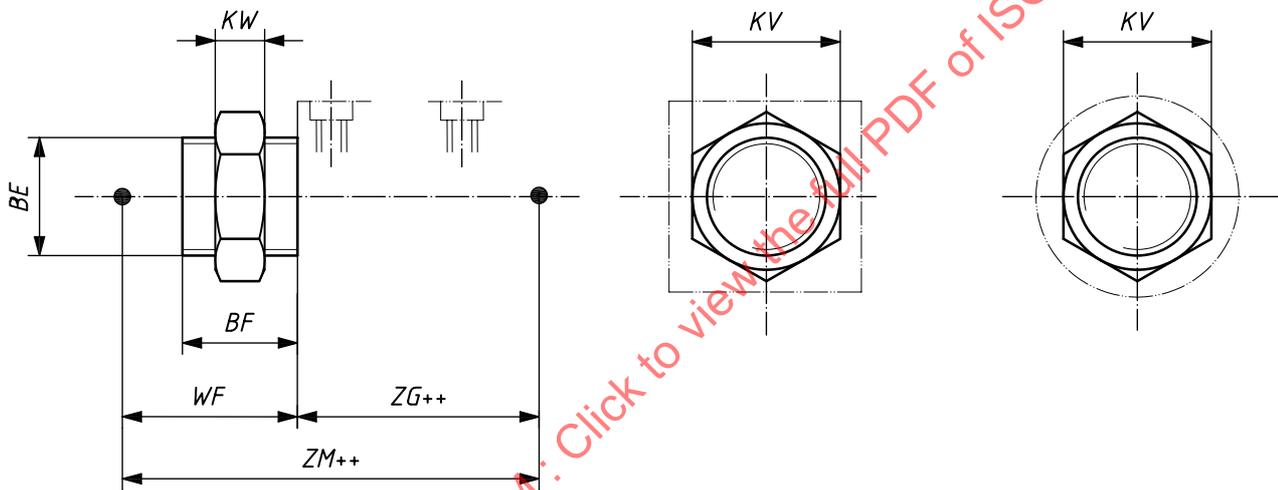


Figure 45 — MDR 3: Head, threaded — Double rod

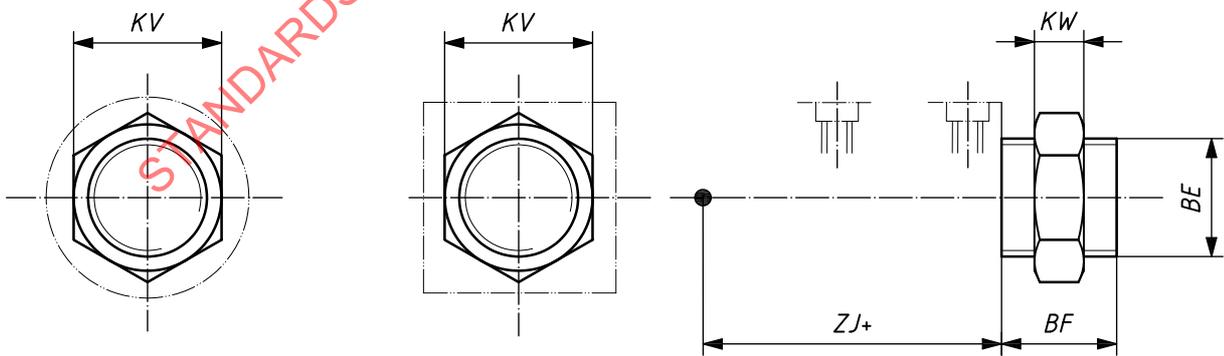


Figure 46 — MR 4: Cap, threaded

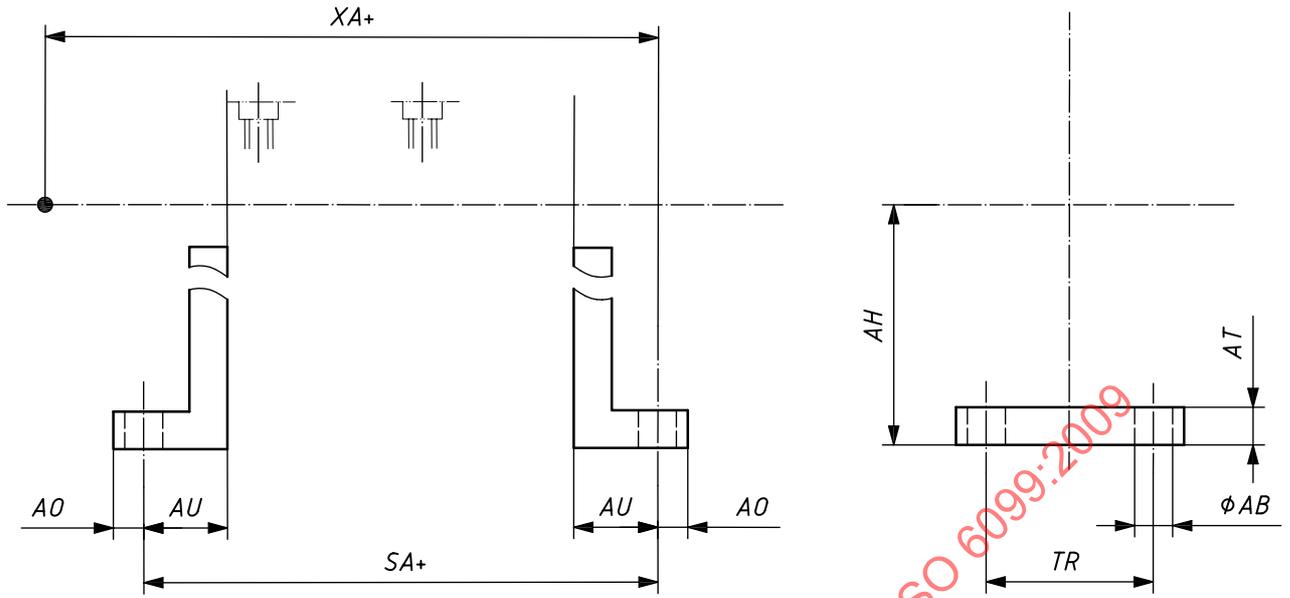


Figure 47 — MS 1: End angles

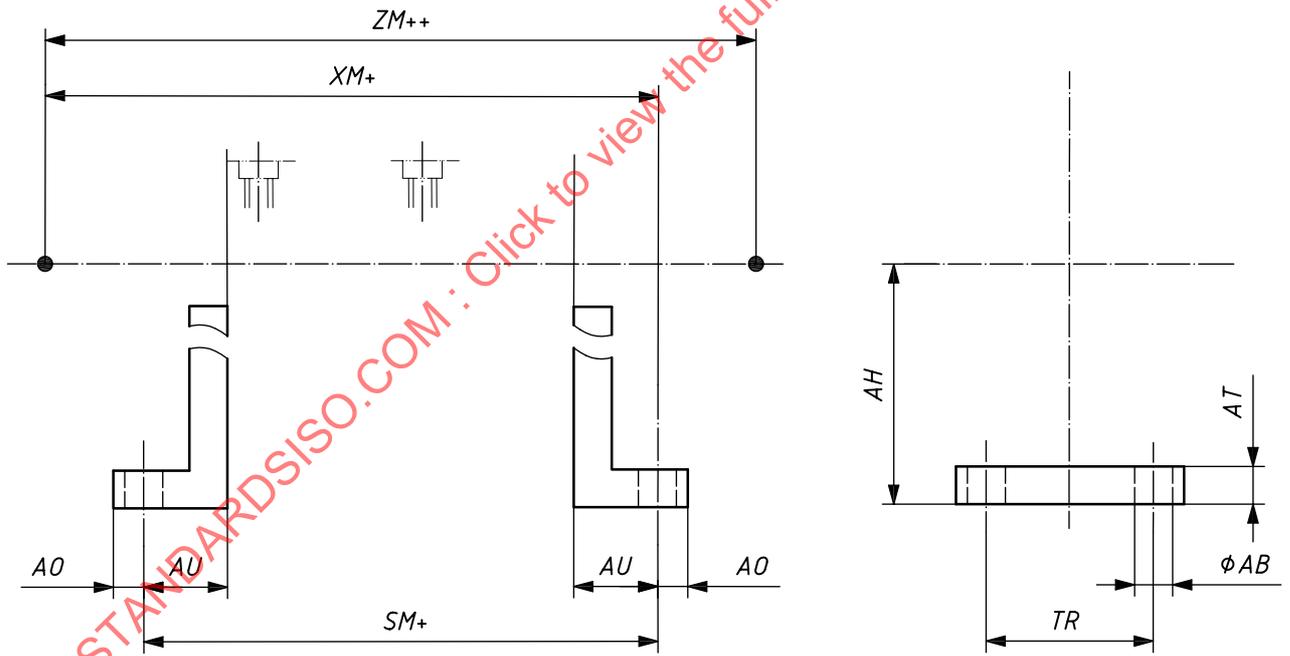


Figure 48 — MDS 1: End angles — Double rod

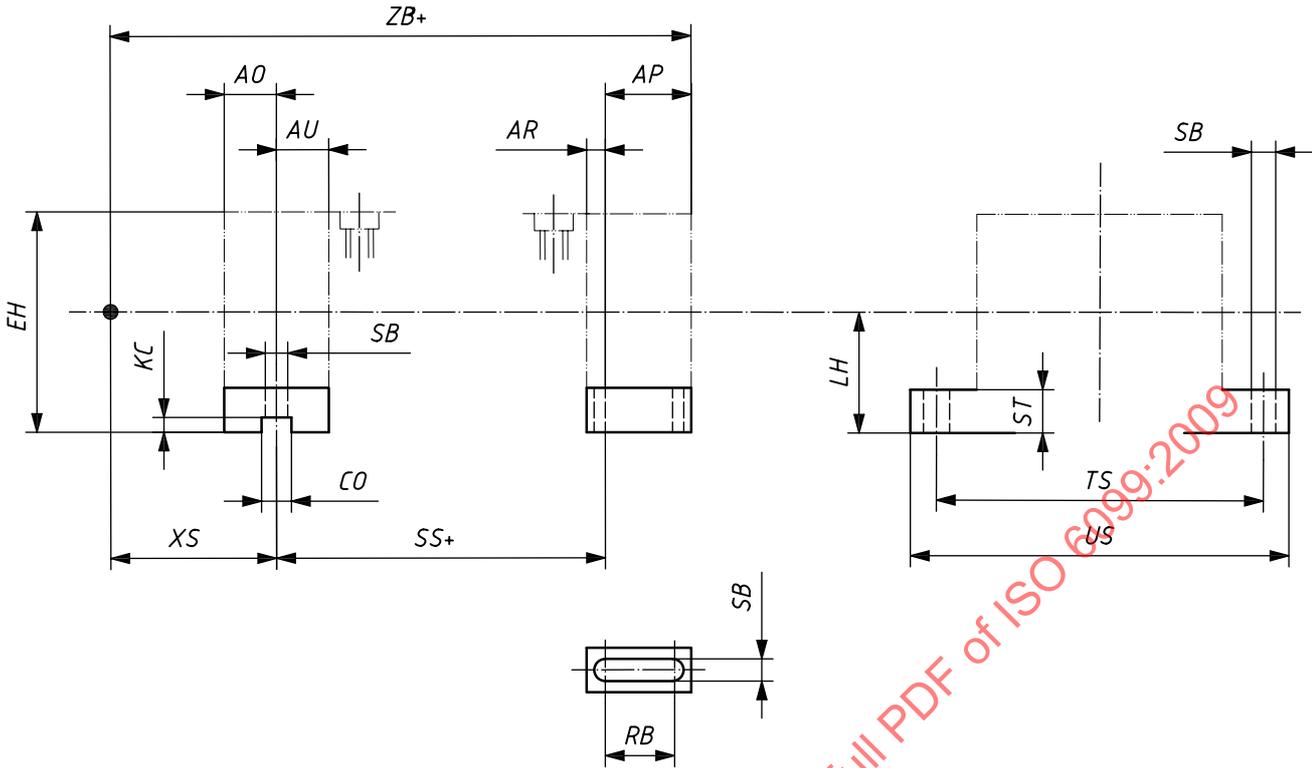


Figure 49 — MS 2: Side lugs

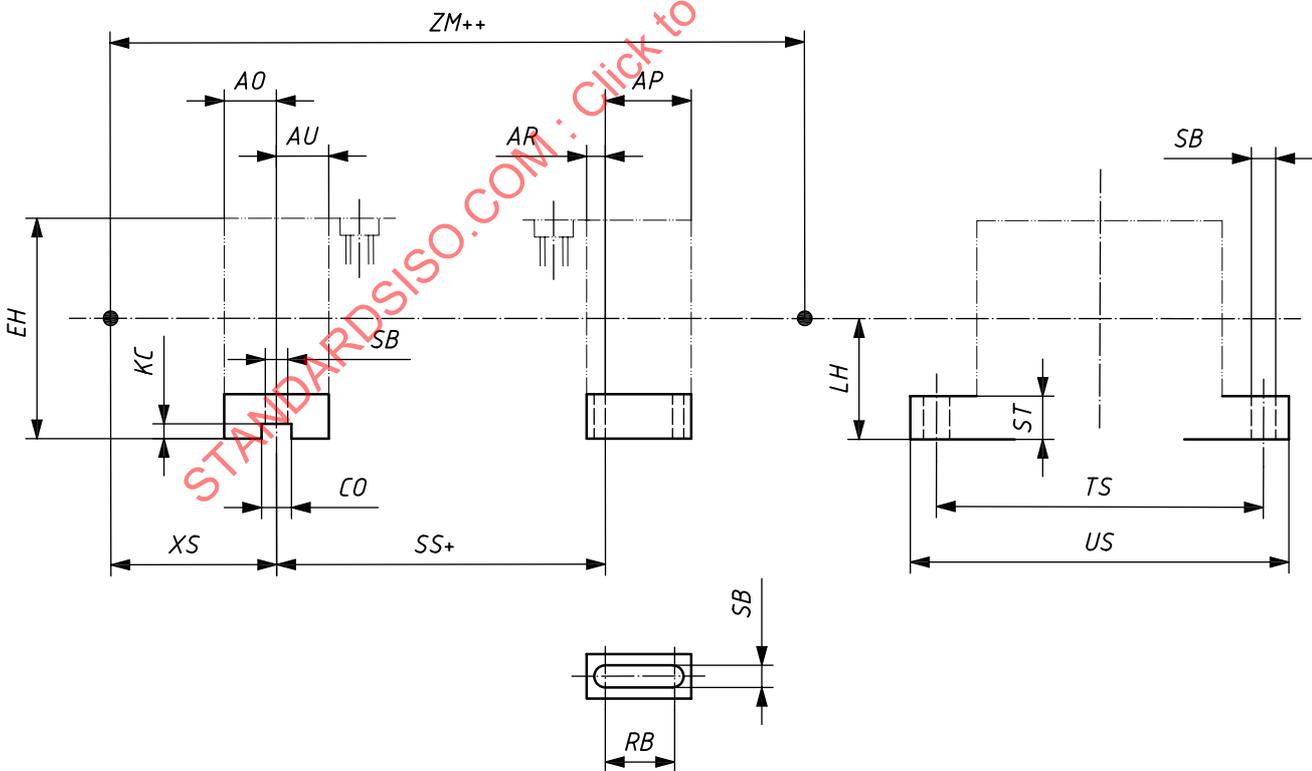


Figure 50 — MDS 2: Side lugs — Double rod

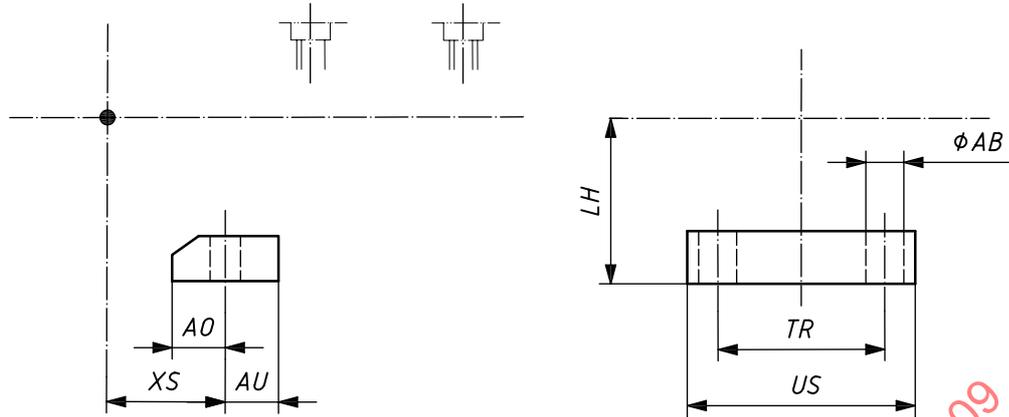


Figure 51 — MS 3: Head angle

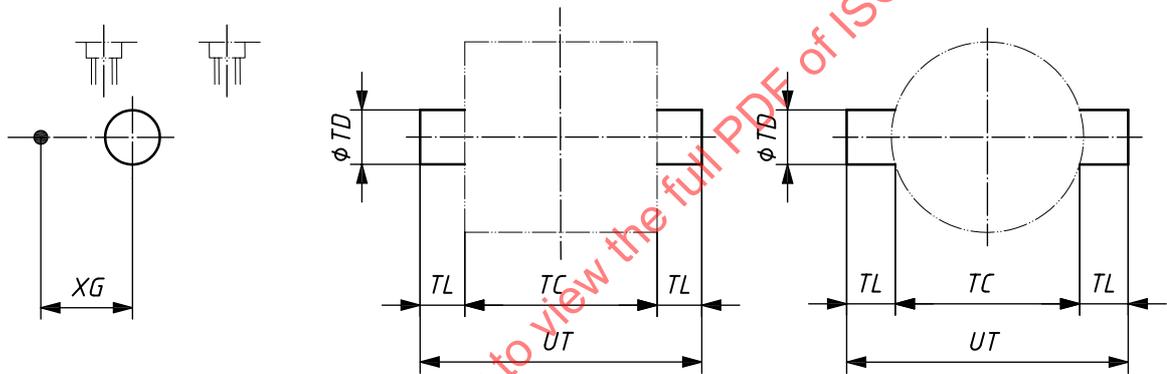


Figure 52 — MT 1: Head, integral trunnion (male)

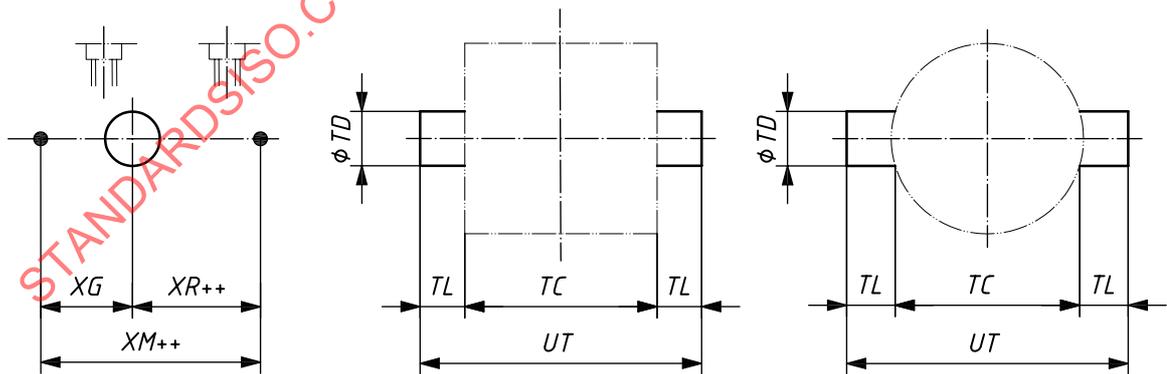


Figure 53 — MDT 1: Head, integral trunnion (male) — Double rod

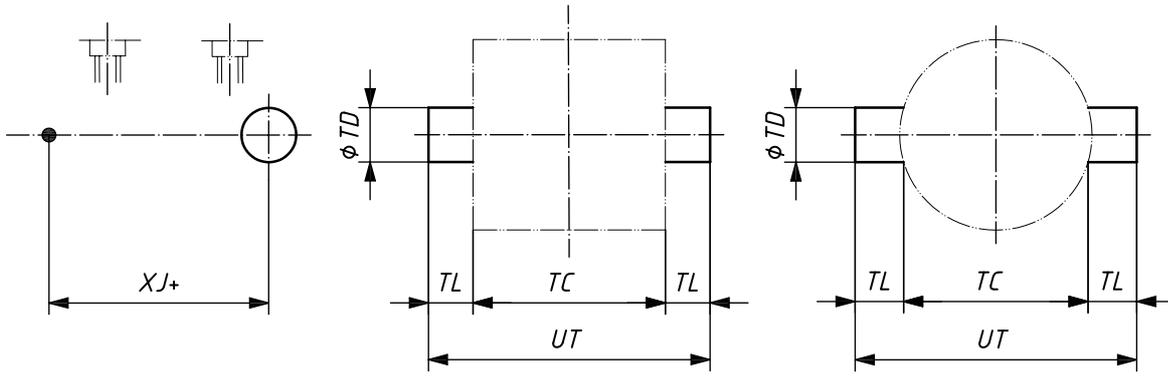


Figure 54 — MT 2: Cap, integral trunnion (male)

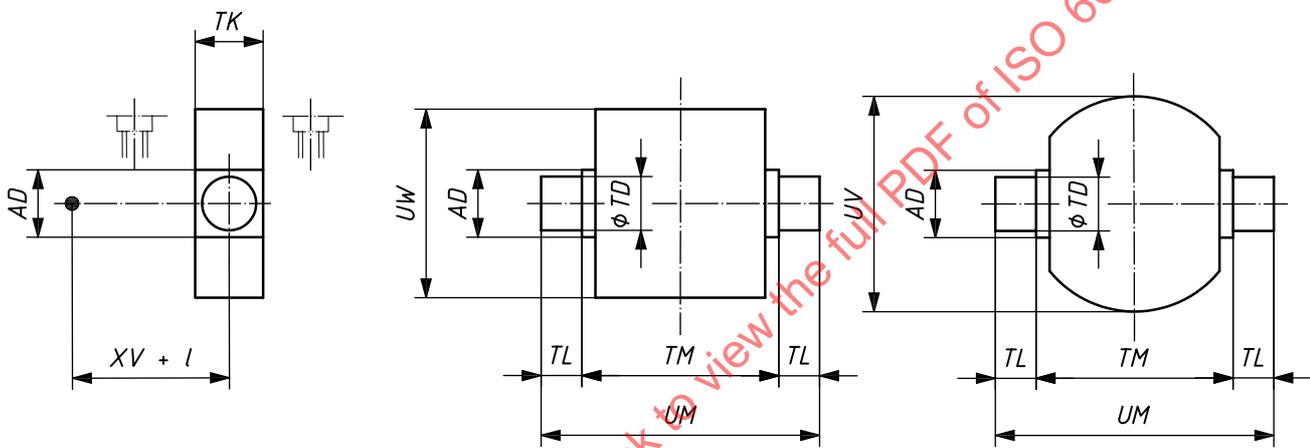


Figure 55 — MT 4: Intermediate trunnion (male) fixed or mobile

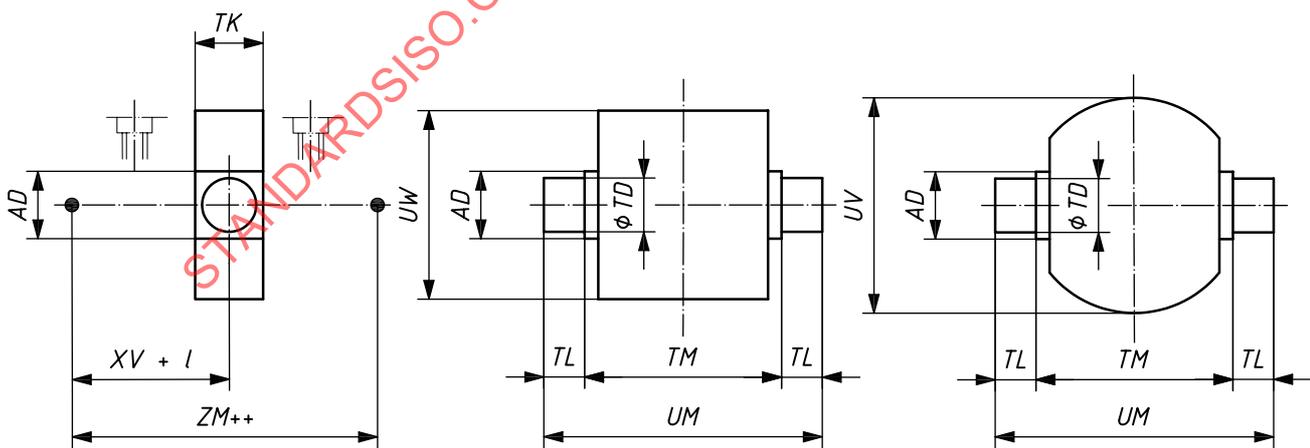


Figure 56 — MDT 4: Intermediate trunnion (male) fixed or mobile — Double rod

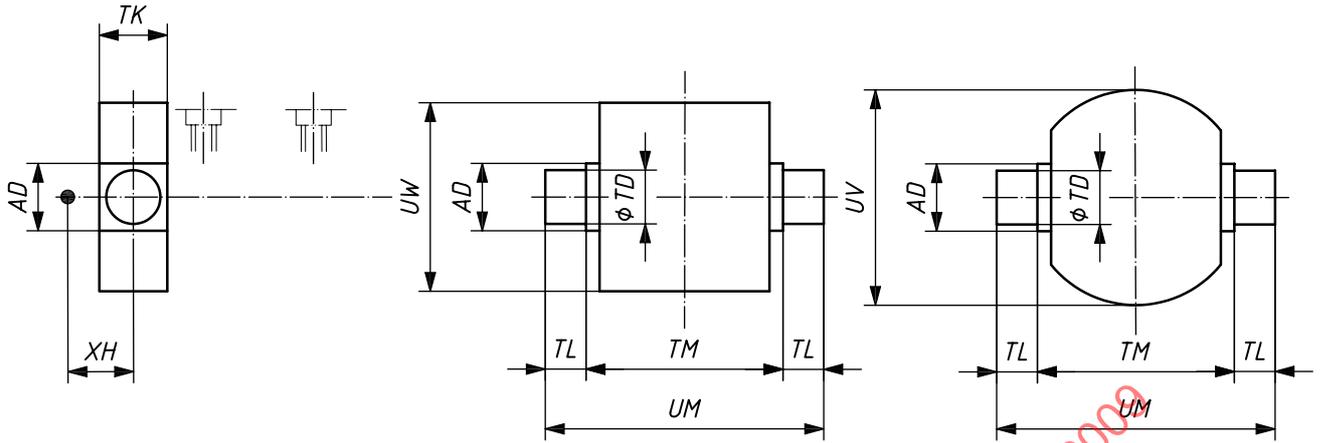


Figure 57 — MT 5: Head, detachable trunnion (male)

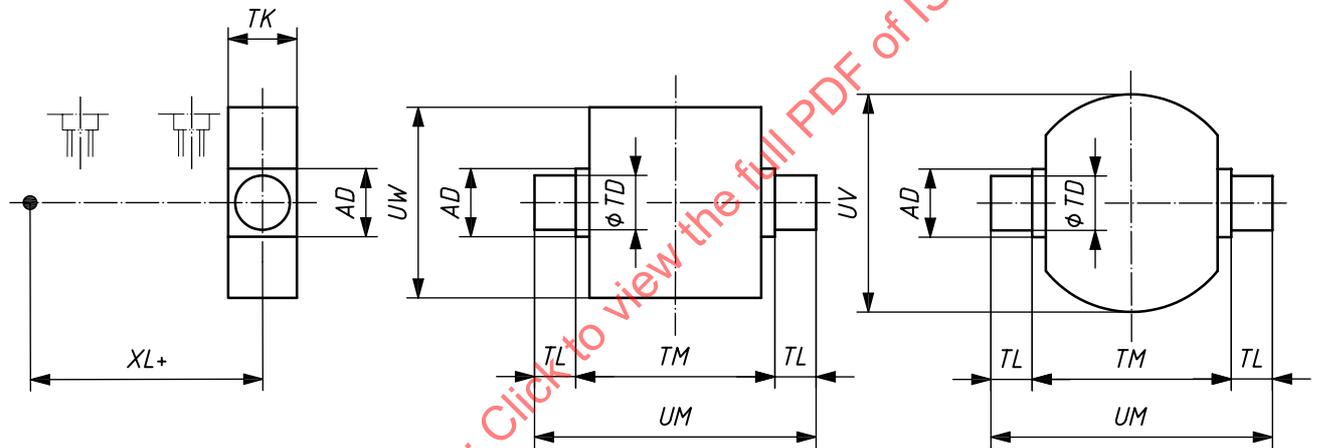


Figure 58 — MT 6: Cap, detachable trunnion (male)

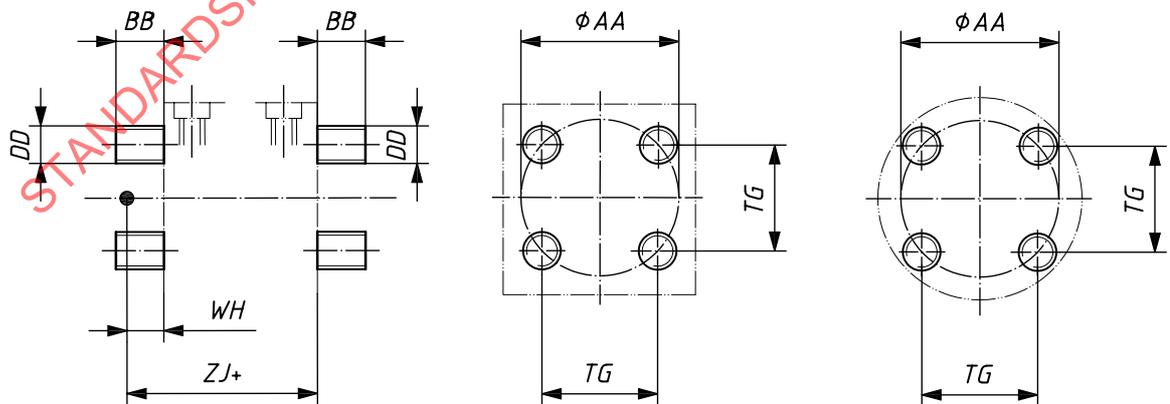


Figure 59 — MX 1: Both ends studs or tie rods extended

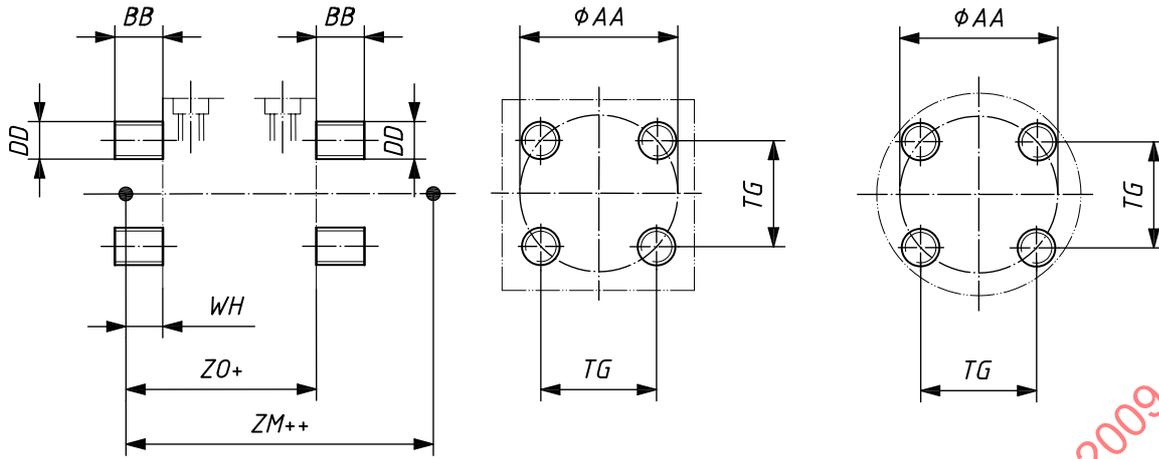


Figure 60 — MDX 1: Both ends studs or tie rods extended — Double rod

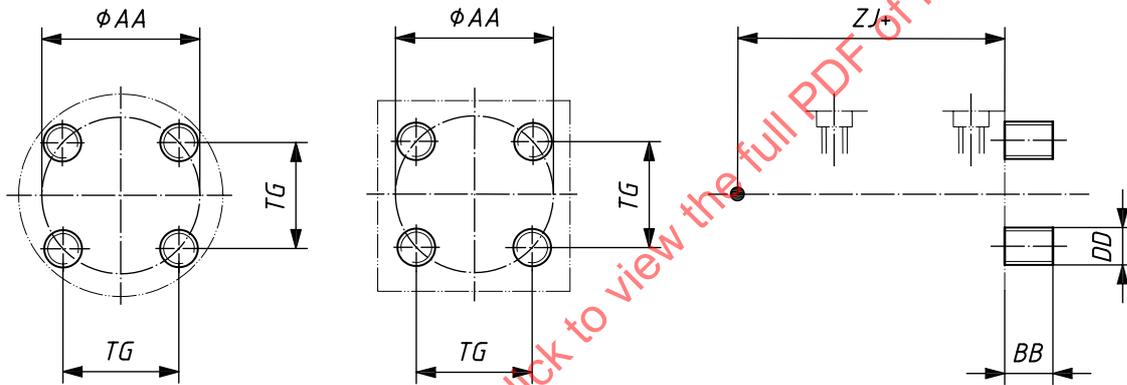


Figure 61 — MX 2: Cap studs or tie rods extended

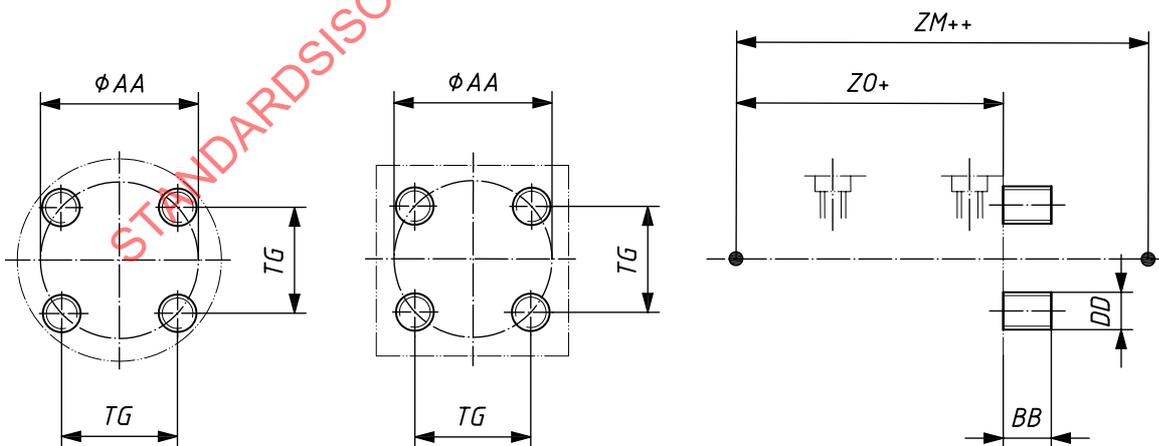


Figure 62 — MDX 2: Cap studs or tie rods extended — Double rod

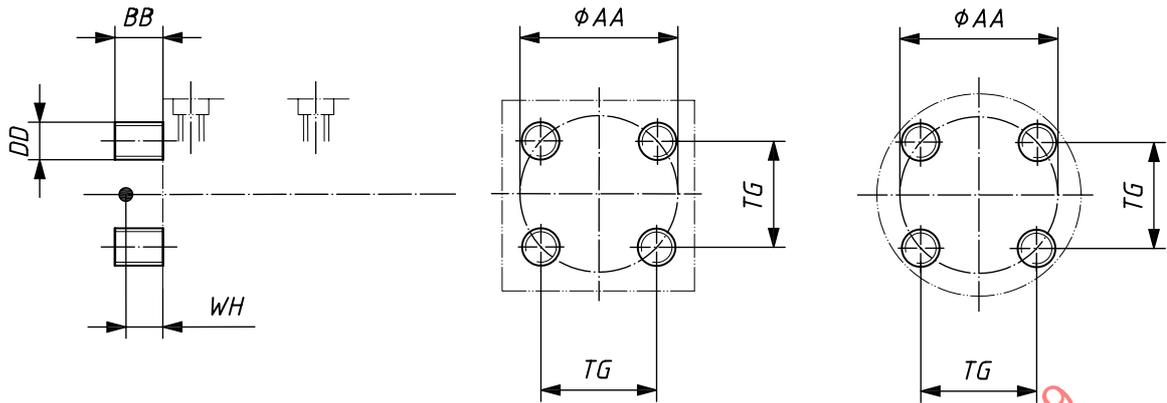


Figure 63 — MX 3: Head studs or tie rods extended

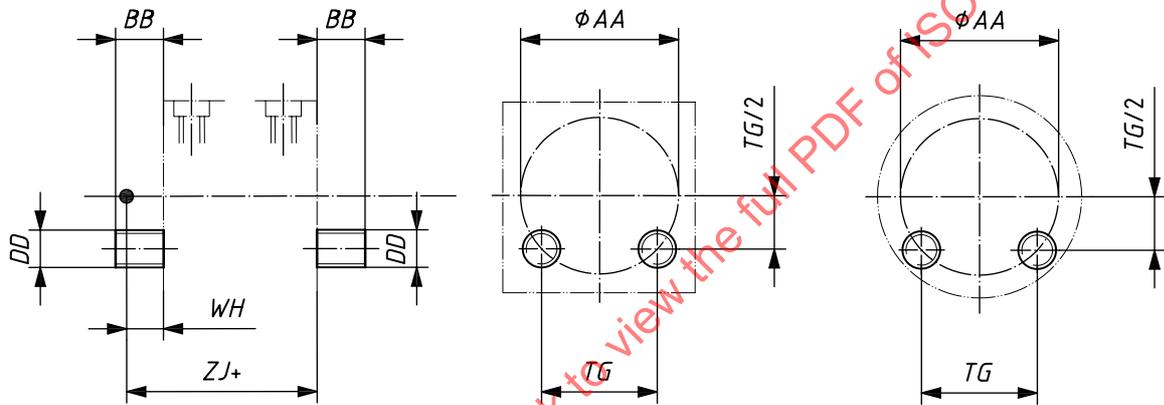


Figure 64 — MX 4: Both ends 2 studs or tie rods extended

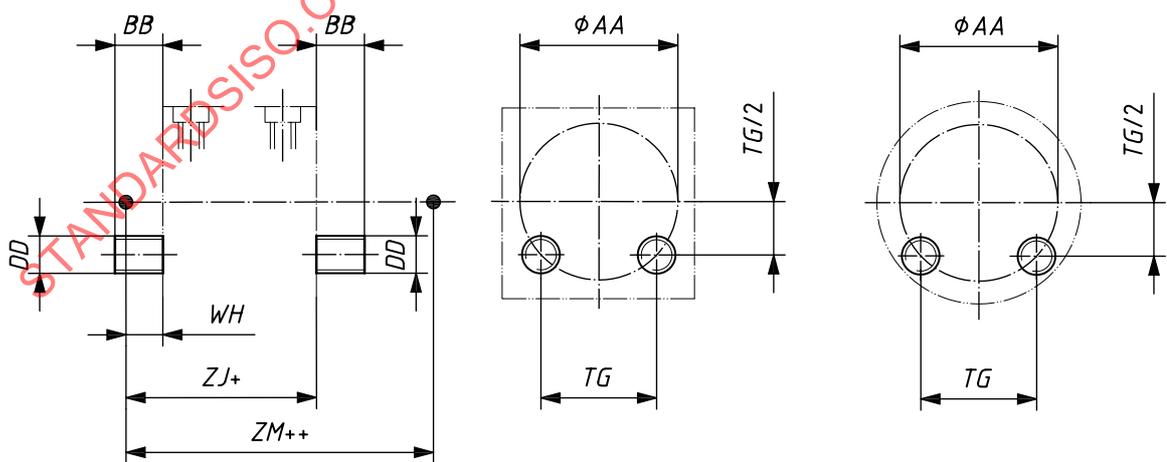


Figure 65 — MDX 4: Both ends 2 studs or tie rods extended — Double rod

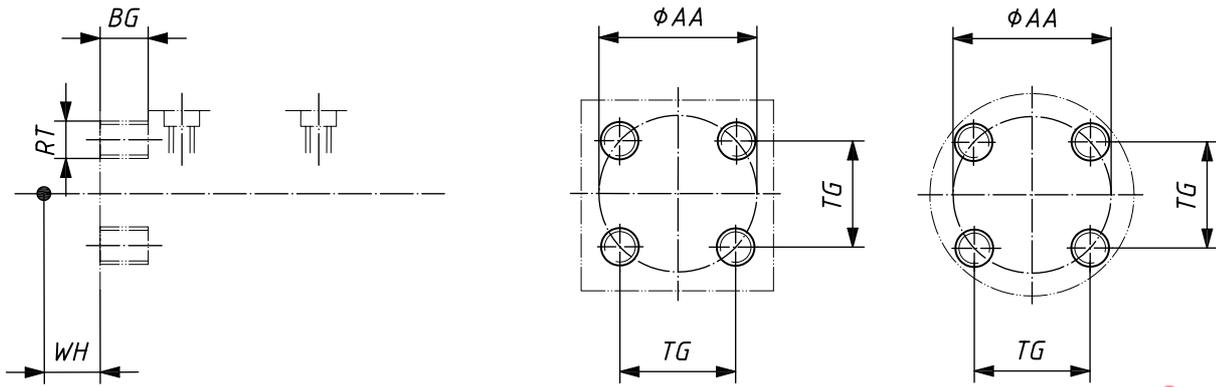


Figure 66 — MX 5: Head, tapped

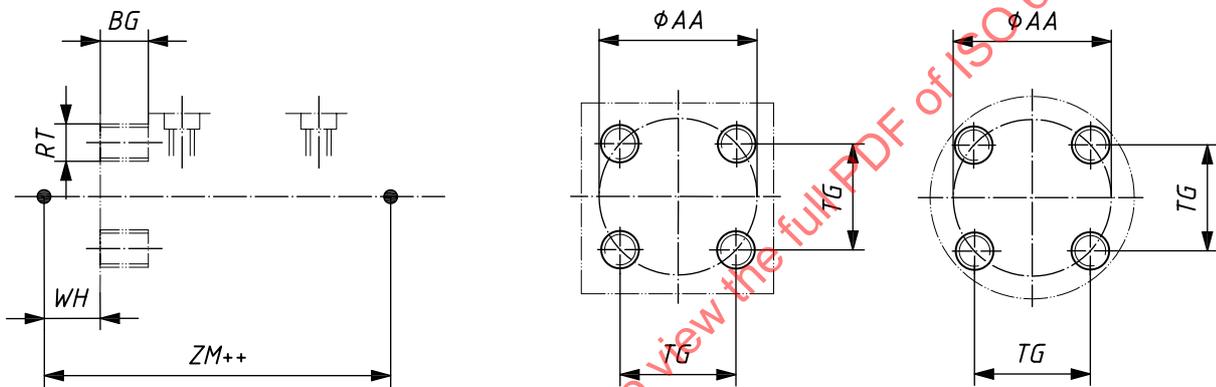


Figure 67 — MDX 5: Head, tapped — Double rod

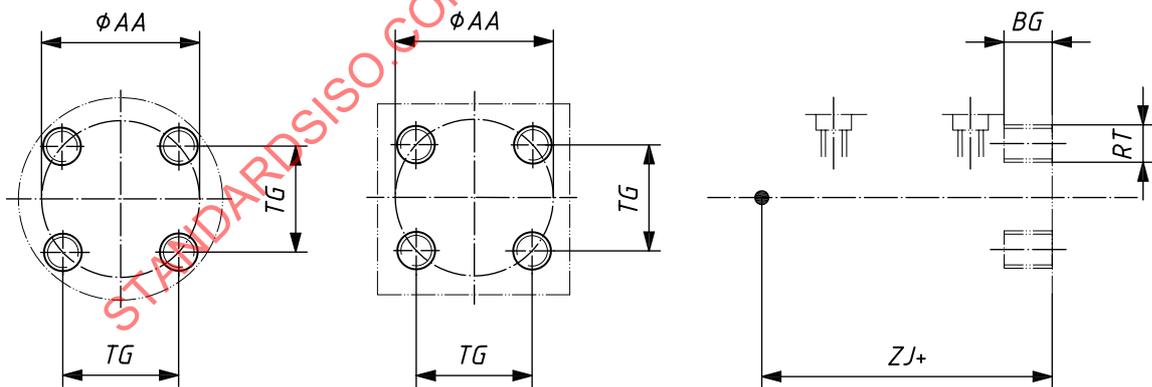


Figure 68 — MX 6: Cap, tapped

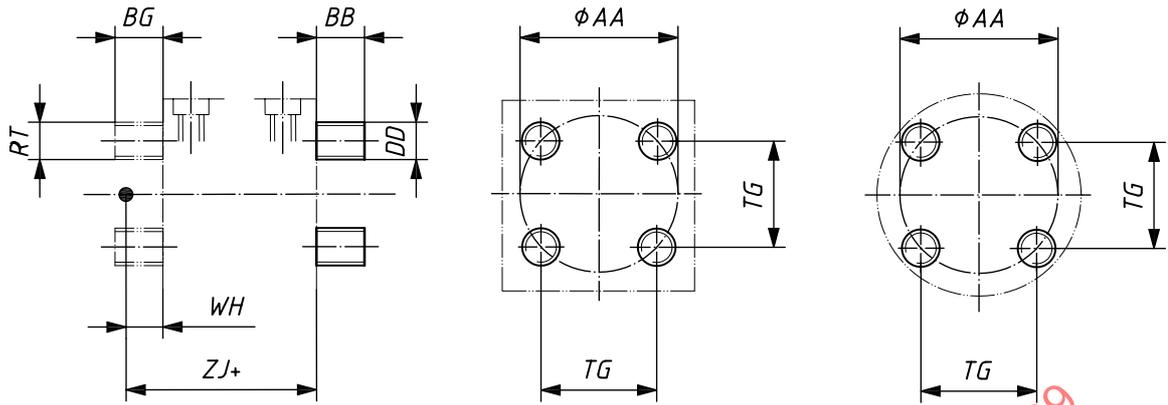


Figure 69 — MX 7: Head, tapped, and cap studs or tie rods extended

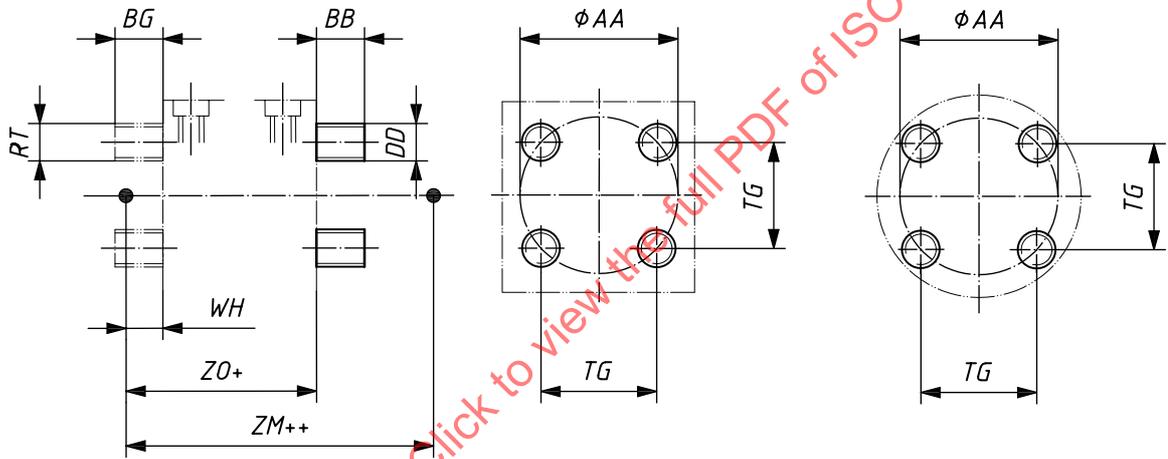


Figure 70 — MDX 7: Head, tapped, and cap studs or tie rods extended — Double rod

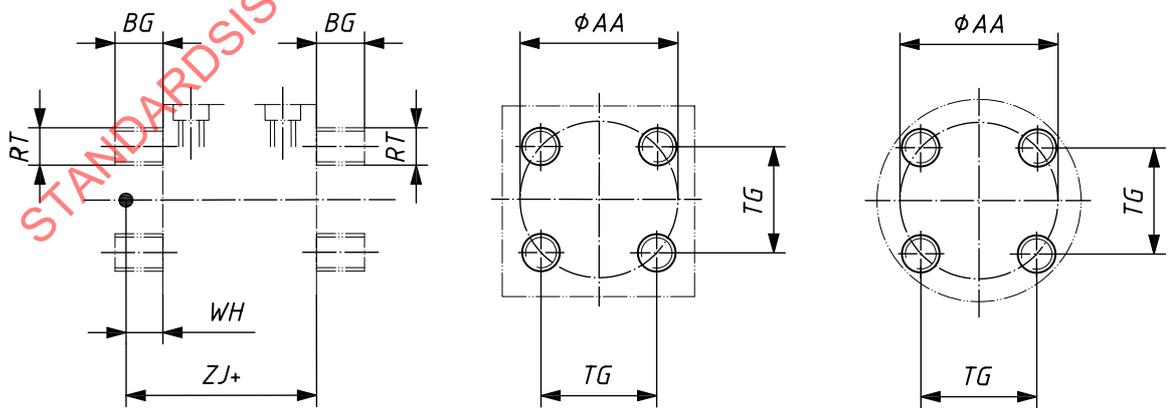


Figure 71 — MX 8: Head and cap, tapped

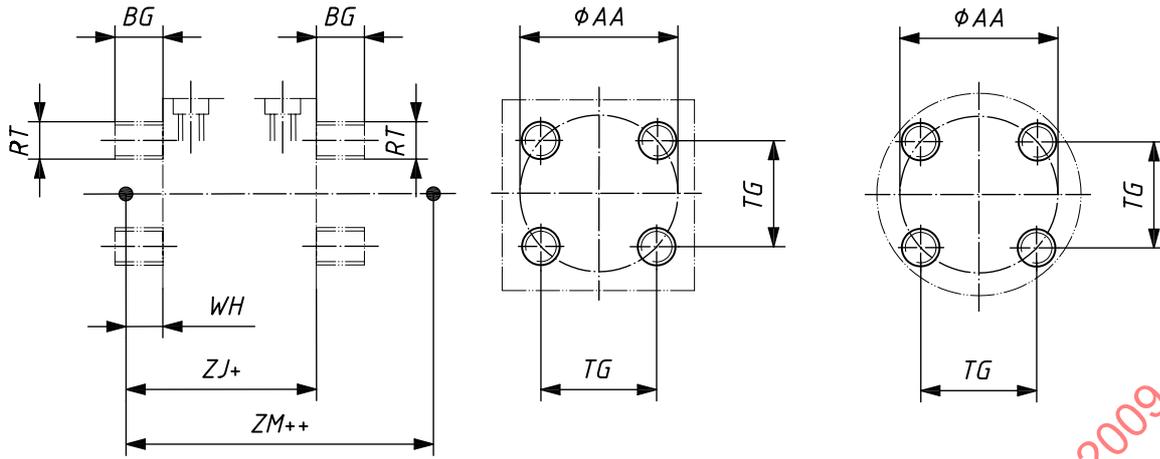


Figure 72 — MDX 8: Head and cap, tapped — Double rod

7 Identification code for accessory types

7.1 General

The identification code for cylinder accessory types consists of two letters and a number.

EXAMPLE



7.2 Accessory types

The accessory types defined in this International Standard are given with their identification code in Table 3.

Table 3 — Accessory types

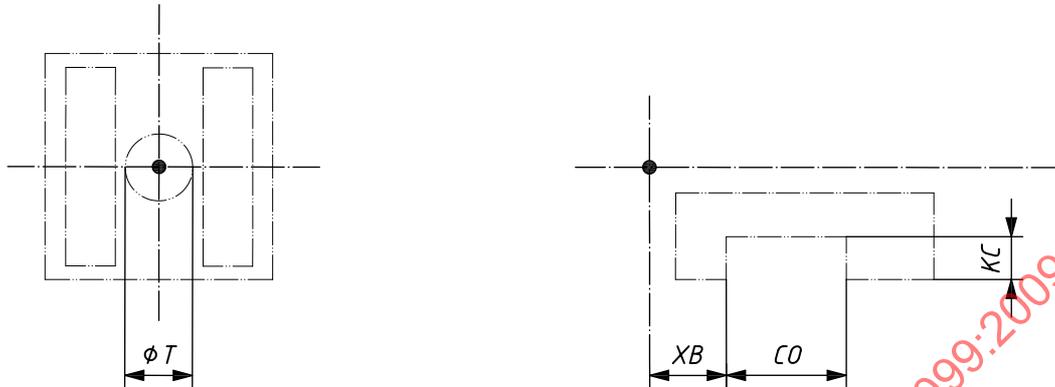
Identification code	Description	Figure	With split pins	With rings	With locking plate	With key way	With centre hole
			- S ^a	- R ^a	- L ^a	- K ^a	- H ^a
AA4	Pivot pin, plain	84, 86, 90	- S	- R	- L		
AA6	Pivot pin, spherical bearing	85, 87, 88	- S	- R	- L		
AB2	Eye bracket, straight	77				- K	
AB3	Clevis bracket, in angle	79			- L	- K	- H
AB4	Clevis bracket, straight	78			- L	- K	- H
AB5	Clevis bracket, spherical eye, in angle	81			- L	- K	- H
AB6	Clevis bracket, spherical eye, straight	80			- L	- K	- H
AB7	Eye bracket, in angle	91				- K	
AF3	Rod flange, circular	82					
AL6	Locking plate for pivot pin	89					
AP2	Rod clevis, female thread	74			- L		
AP4	Rod eye plain, female thread	75					
AP6	Rod eye spherical, female thread	76					
AT4	Trunnion bracket	83					

^a See Figure 73.

EXAMPLE **AB4-L-K** Accessory Clevis bracket, straight with locking plate and key way.

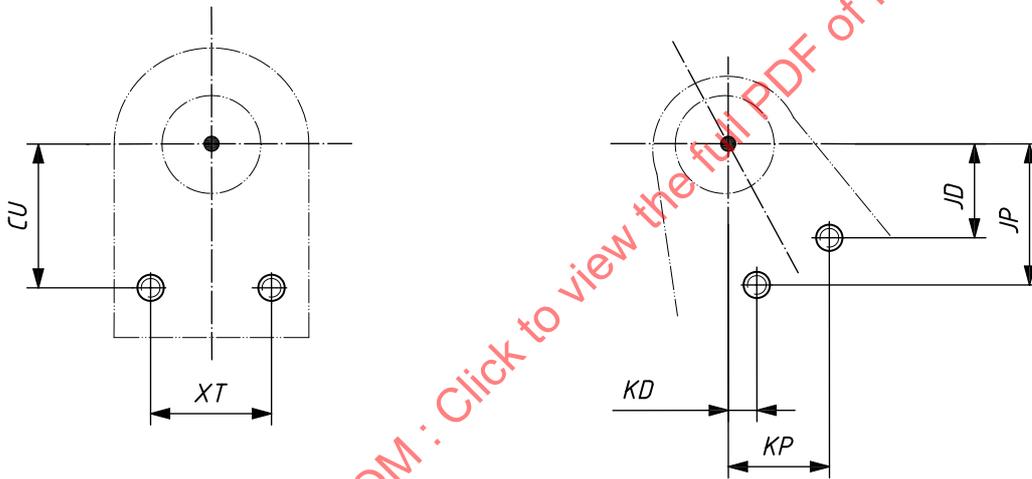
7.3 Letter codes of accessories according to accessory type

The letter code for accessories according to type is shown in Figure 73 to Figure 91.



a) Centre hole through the mounting face - H

b) Key way - K



c) Mounting bolts for locking plate - L

Figure 73 — Optional function for accessories

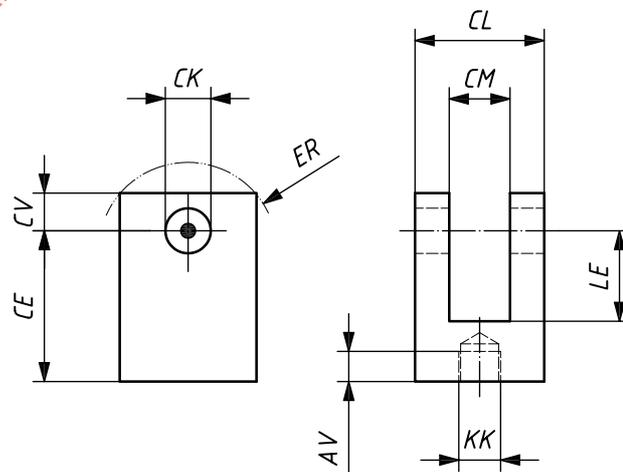


Figure 74 — AP2: Rod clevis, female thread

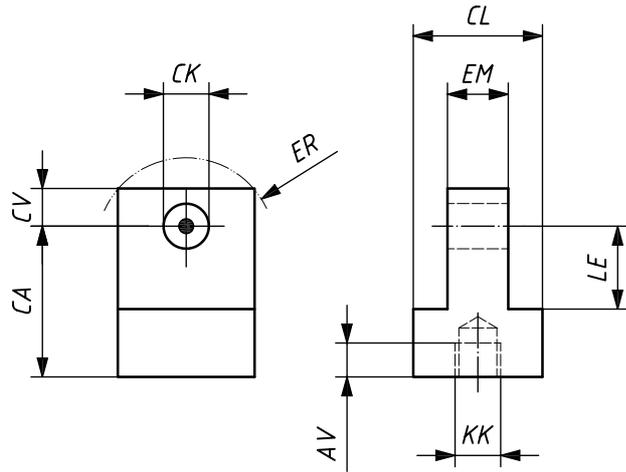


Figure 75 — AP4: Rod eye plain, female thread

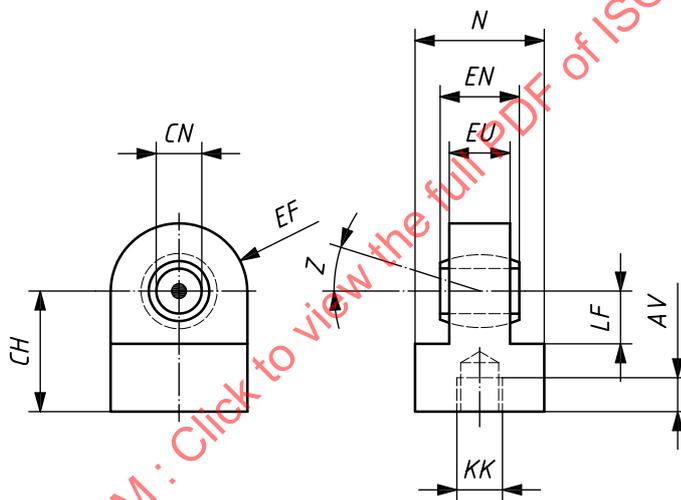


Figure 76 — AP6: Rod eye spherical, female thread

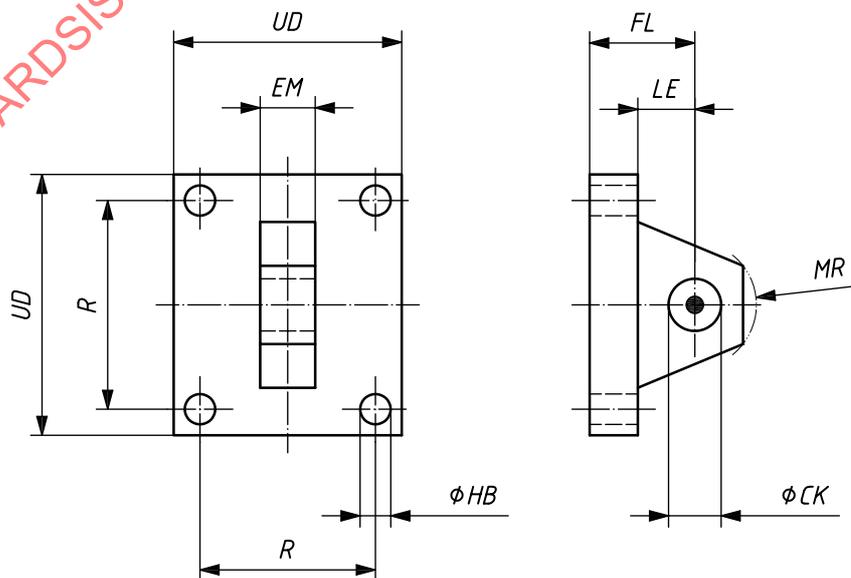


Figure 77 — AB2: Eye bracket, straight

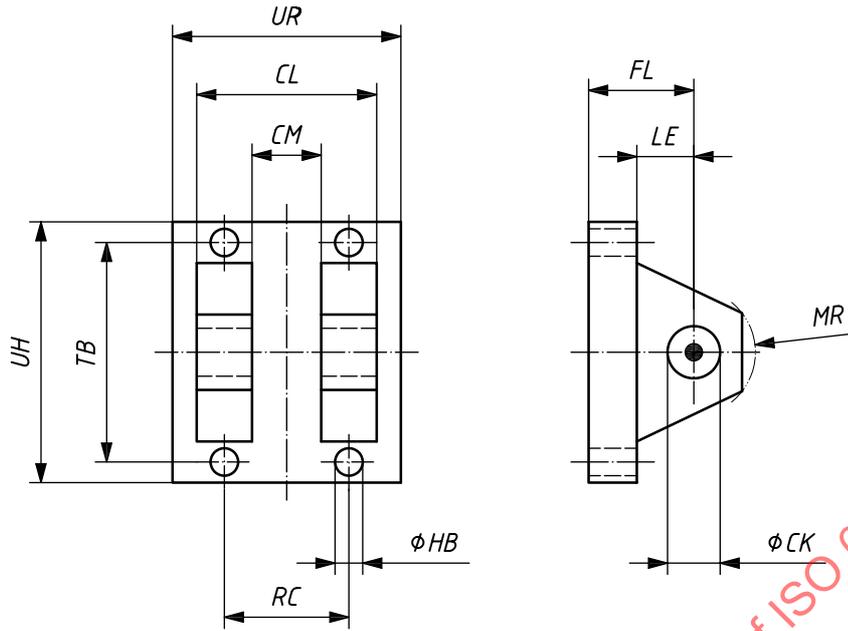


Figure 78 — AB4: Clevis bracket, straight

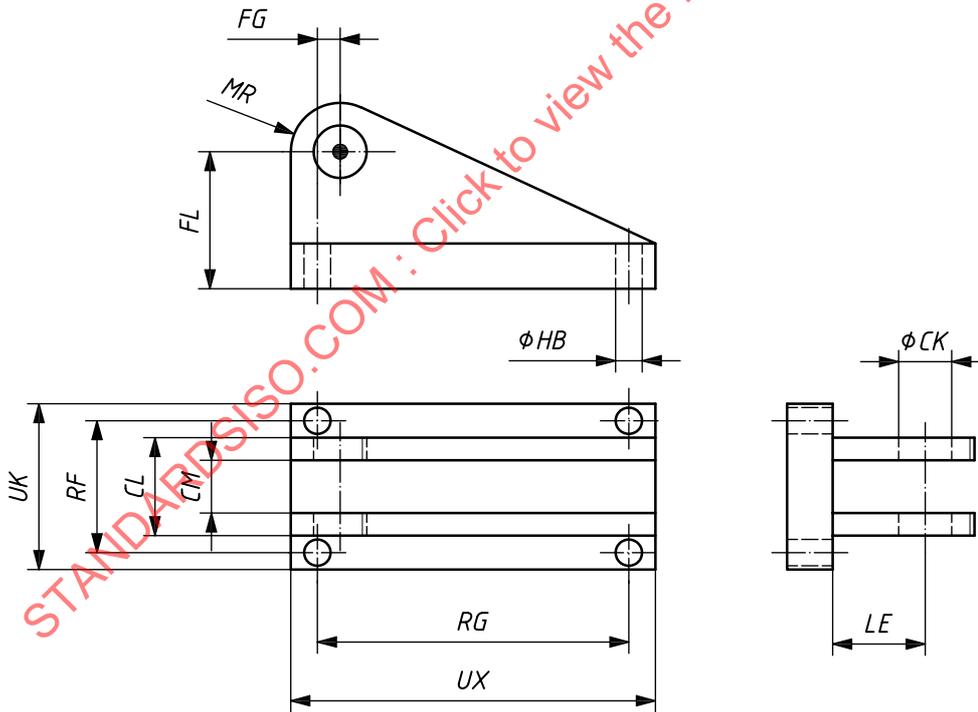


Figure 79 — AB3: Clevis bracket, in angle

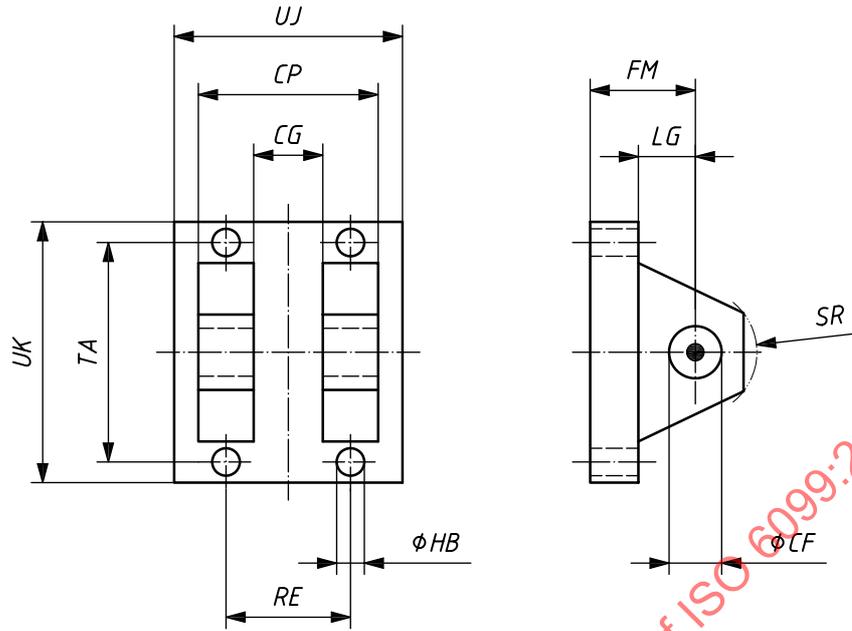


Figure 80 — AB6: Clevis bracket, spherical eye, straight

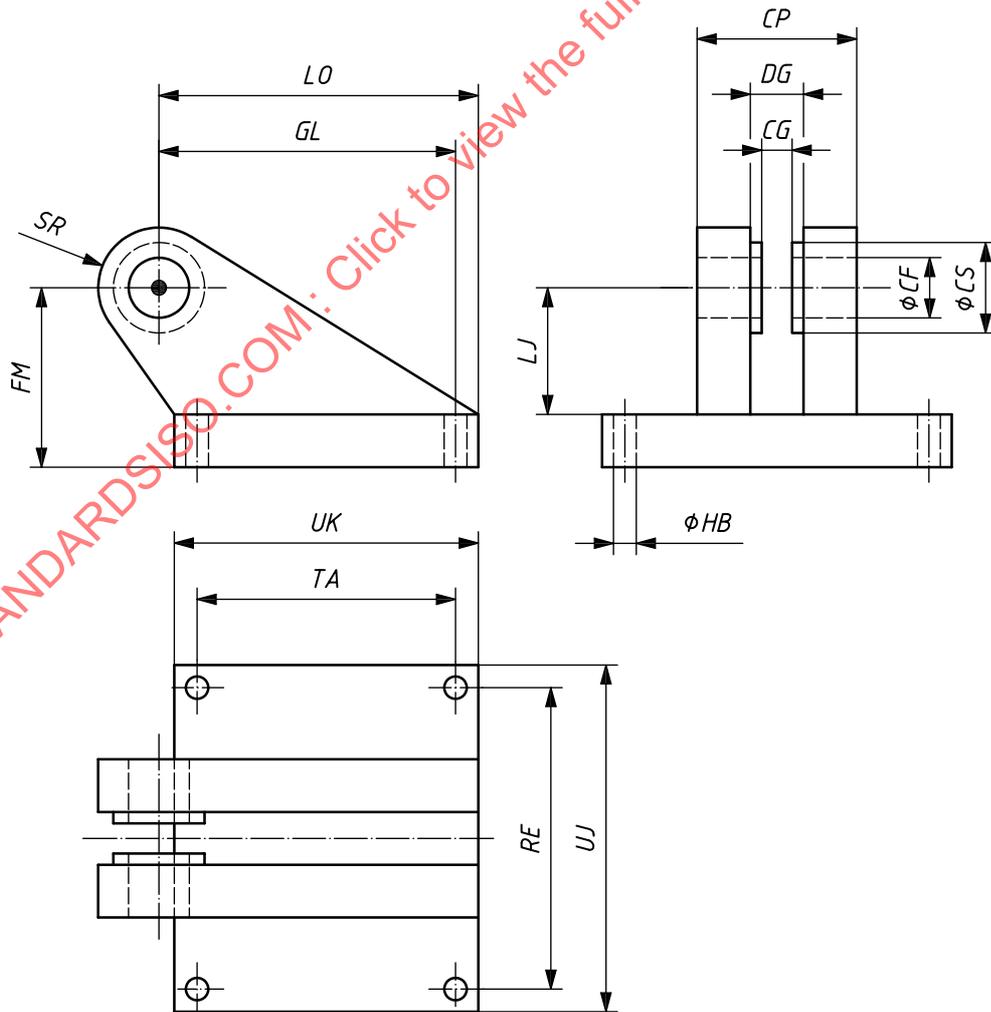


Figure 81 — AB5: Clevis bracket, spherical eye, in angle

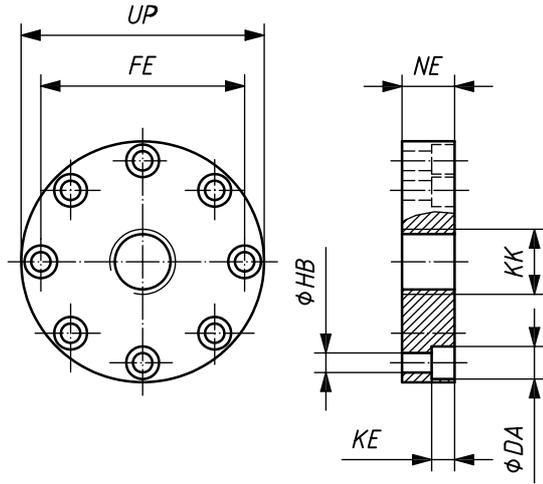


Figure 82 — AF3: Rod flange, circular

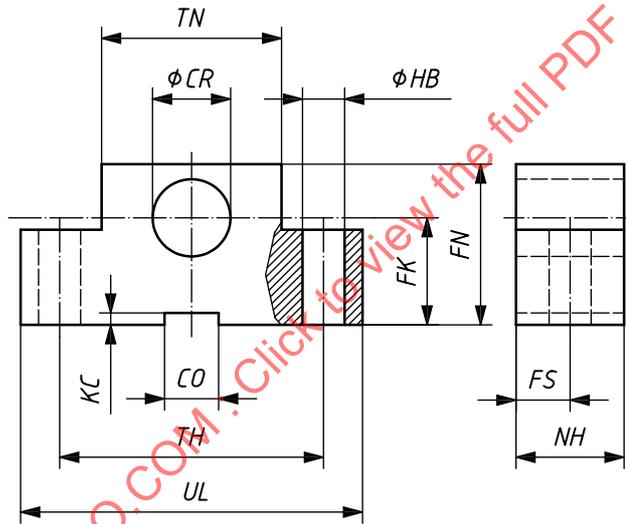


Figure 83 — AT4: Trunnion bracket

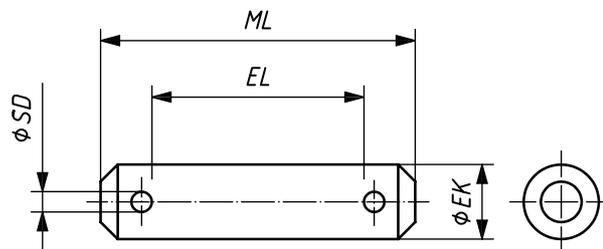


Figure 84 — AA4 - S: Pivot pin, plain, split pins

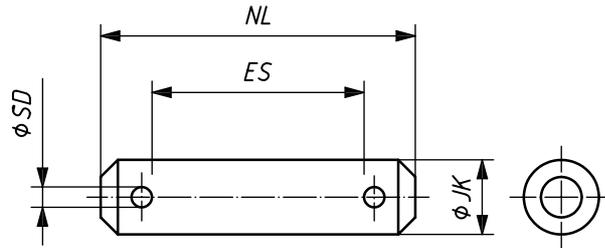


Figure 85 — AA6 - S: Pivot pin, spherical bearing, split pins

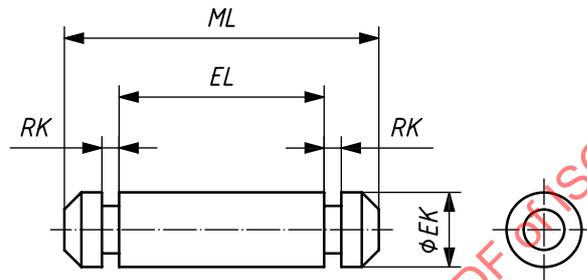


Figure 86 — AA4 - R: Pivot pin, plain, rings

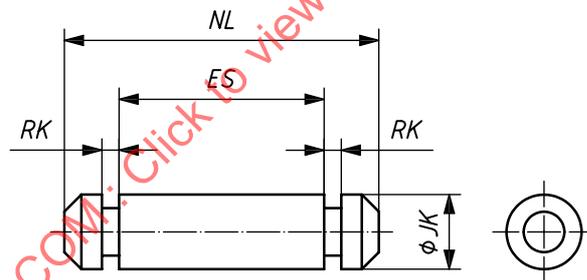


Figure 87 — AA6 - R: Pivot pin, spherical bearing, rings

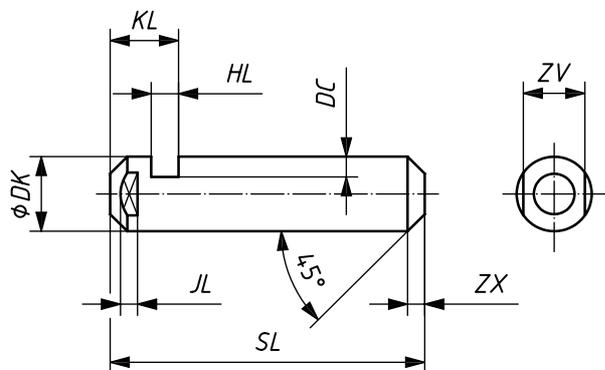
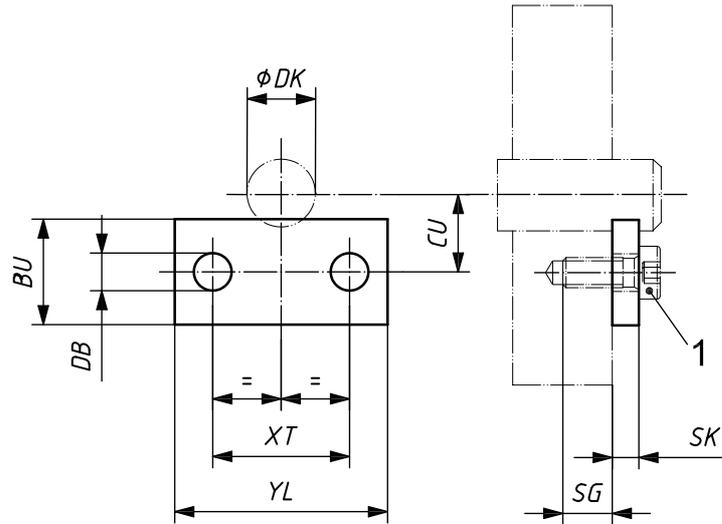


Figure 88 — AA6 - L: Pivot pin, spherical bearing, locking plate



Key
1 screw

Figure 89 — AL6: Locking plate for pivot pin

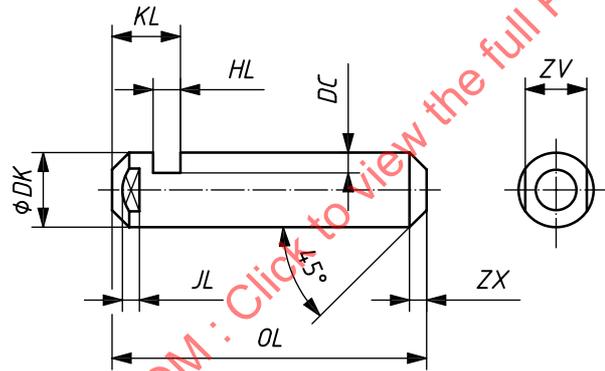


Figure 90 — AA4 - L: Pivot pin, plain, locking plate

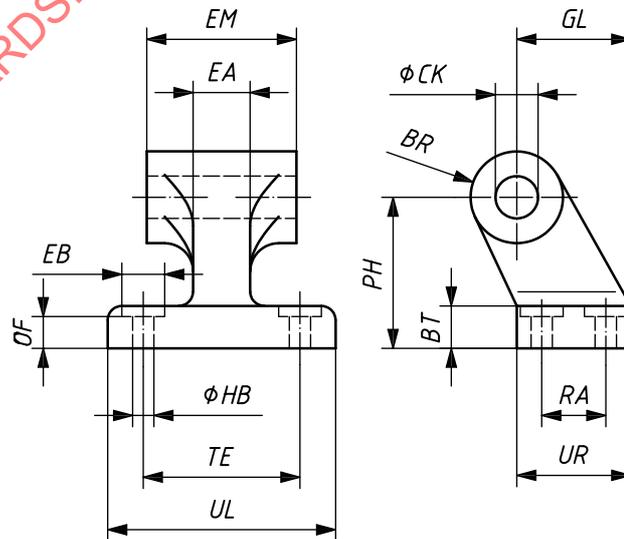


Figure 91 — AB7: Eye bracket, in angle

8 Designation of the position of the ports in round and square types

The designation of the port position can be described for the head and end cap of the cylinder.

— For square type cylinders, port position 1 to port position 4 can be selected as shown in Figure 92.

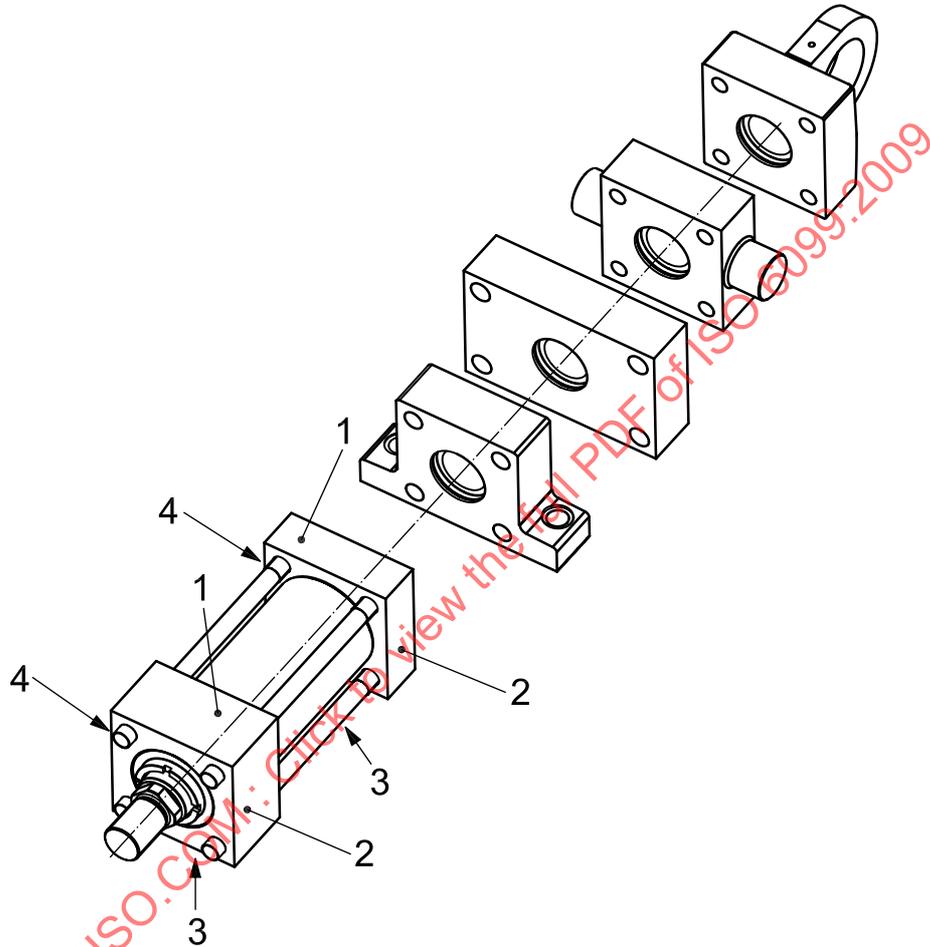


Figure 92 — Port position for square type cylinders

EXAMPLE 1 Example for the designation of the port position:

Port position 1

— For round type cylinders, port position 1 to port position 4 can be selected as shown in Figure 93 or as a sector between two positions.

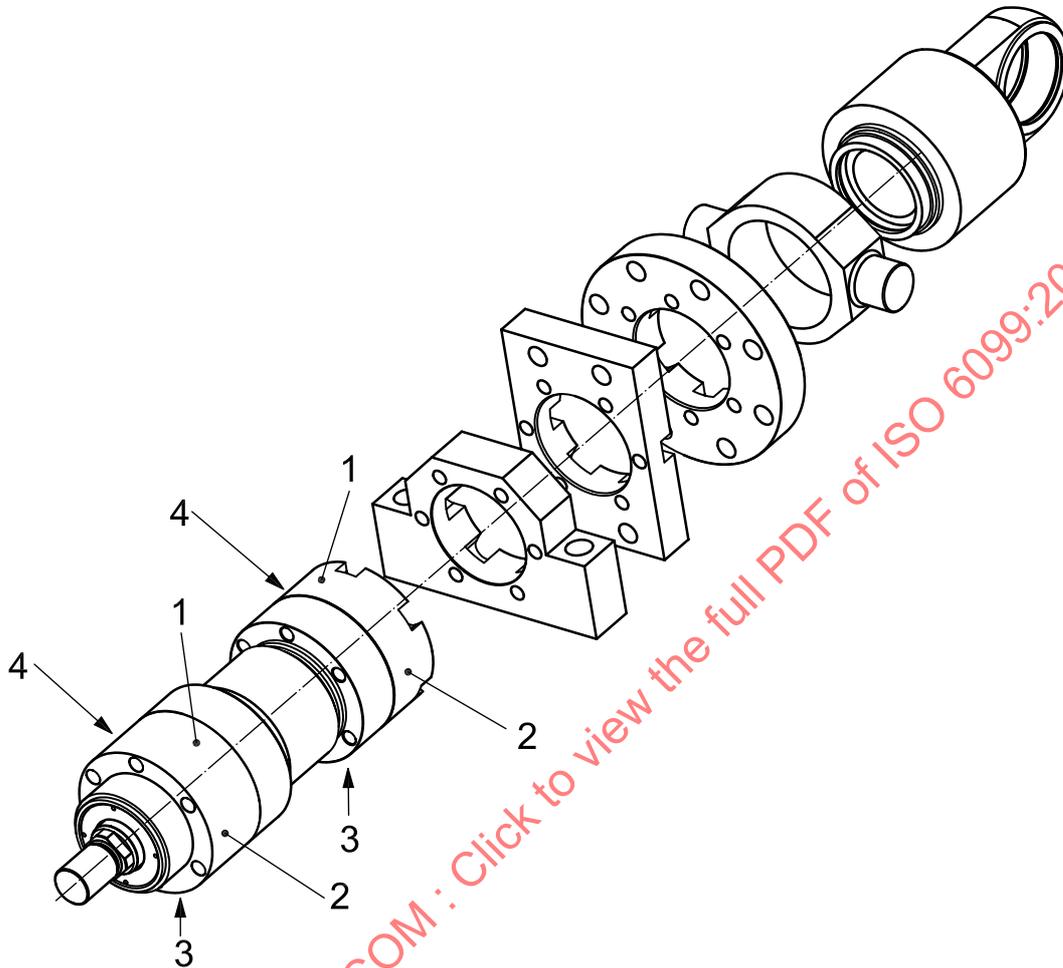


Figure 93 — Port position for round type cylinders

EXAMPLE 2 Example for the designation of the port position:

Port position between 1 and 2

9 Identification statement (Reference to this International Standard)

It is strongly recommended to manufacturers who have chosen to conform to this International Standard that the following statement be used in test reports, catalogues and sales literature:

“Cylinder mounting identification code in accordance with ISO 6099, *Fluid power systems and components — Cylinders — Identification code for mounting dimensions and mounting types.*”

Table 4 — Letter code listing

Symbol	Designation
<i>A</i>	Thread length of externally threaded rod end (rod end dimensions)
<i>B</i>	Diameter of head end pilot (general dimensions — MB 1 — MDB 1 — MB 2 — MDB 2 — ME 5 — MDE 5 — ME 7 — MDE 7 — ME 9 — MDE 9 — ME 11 — MDE 11)
<i>C</i>	
<i>D</i>	Ends outer diameter (general dimensions — MB 2 — MDB2)
<i>E</i>	End view dimensions (general dimensions — MB 1 — MDB 1 — ME 5 — MDE 5 — ME 6 — MF 1 — MDF 1 — MF 2)
<i>F</i>	Thickness of retainer plate (general dimensions — ME 5 — MDE 5 — ME 7 — MDE 7 — ME 9 — MDE 9 — ME 11 — MDE 11)
<i>G</i>	Head thickness (ME 5 — MDE 5 — ME 7 — MDE 7 — ME 9 — MDE 9 — ME 11 — MDE 11)
<i>H</i>	Increase dimension <i>E</i> to facilitate ports (general dimensions — MB 1 — MDB 1 — MB 2 — MDB 2)
<i>J</i>	Cap thickness (ME 6 — ME 8 — ME 10 — ME 12)
<i>K</i>	
<i>L</i>	Clearance around pivot axis (MP 1 — MP 2 — MP 3 — MP 4 — MP 7)
<i>M</i>	
<i>N</i>	Width of rod eye (AP4 — AP6)
<i>O</i>	
<i>P</i>	
<i>R</i>	Distance between mounting holes (AB2 — ME 5 — MDE 5 — ME 6 — MF 1 — MDF 1 — MF 2 — MF 5 — MDF 5 — MF 6 — ME 11 — MDE 11 — ME 12)
<i>S</i>	
<i>T</i>	Clearance hole through the mounting face (AB4 — AB6)
<i>U</i>	
<i>V</i>	
<i>W</i>	Distance between TRP ^a and mounting face (MF 1 — MDF 1 — MF 8)
<i>X</i>	
<i>Y</i>	Distance between TRP and head port (general dimensions)
<i>Z</i>	Tilting angle (AP 6 — MP 5 — MP 6)

Table 4 (continued)

Symbol 2nd letter	Designation
<i>A</i>	
<i>AA</i>	Pitch circle diameter of studs or tie rods (for reference only) (MX1 — MDX 1 — MX 2 — MDX 2 — MX 3 — MX 4 — MDX 4 — MX 5 — MDX 5 — MX 6 — MX 7 — MDX 7 — MX 8 — MDX 8)
<i>BA</i>	Diameter of cap pilot (general dimensions — MF 2 — MF 4)
<i>CA</i>	Distance between TRP and pivot axis (AP4)
<i>DA</i>	Counter sunk diameter for mounting screws (AF3)
<i>EA</i>	Rib thickness (AB7)
<i>FA</i>	
<i>GA</i>	
<i>HA</i>	
<i>JA</i>	
<i>KA</i>	Nut height, recessed (general dimensions)
<i>LA</i>	
<i>MA</i>	Flange diameter (rod end dimensions)
<i>NA</i>	
<i>OA</i>	
<i>PA</i>	
<i>RA</i>	Longitudinal distance (AB7)
<i>SA</i>	Longitudinal distance between mounting holes (MS 1)
<i>TA</i>	Distance between mounting holes (AB5 — AB6)
<i>UA</i>	
<i>VA</i>	Cap pilot extension (general dimensions)
<i>WA</i>	
<i>XA</i>	Distance between TRP and rear mounting holes (MS 1)
<i>YA</i>	
<i>ZA</i>	

Table 4 (continued)

Symbol 2nd letter	Designation
<i>B</i>	
<i>AB</i>	Mounting holes diameter (MS 1 — MDS 1 — MS 3)
<i>BB</i>	Length of stud or tie rod extension (MX 1 — MDX 1 — MX 2 — MDX 2 — MX 3 — MX 4 — MDX 4 — MX 7 — MDX 7)
<i>CB</i>	Clevis slot width (MP 1 — MP 2 — MP 7)
<i>DB</i>	Mounting holes for diameter locking plate (AL6)
<i>EB</i>	Diameter of mounting hole spot facing (AB7)
<i>FB</i>	Mounting holes diameter (MB 1 — MDB 1 — MB 2 — MDB 2 — ME 5 — MDE 5 — ME 6 — ME 7 — MDE 7 — ME 8 — ME 9 — MDE 9 — ME 10 — ME 11 — MDE 11 — ME 12 — MF 1 — MDF 1 — MF 2 — MF 3 — MDF 3 — MF 4 — MF 5 — MDF 5 — MF 6 — MF 7 — MDF 7 — MF 8)
<i>GB</i>	
<i>HB</i>	Mounting holes diameter (AB2 — AB3 — AB4 — AB5 — AB6 — AB7 — AF3 — AT4)
<i>JB</i>	
<i>KB</i>	Nut height, exposed (general dimensions)
<i>LB</i>	
<i>MB</i>	Groove diameter (rod end dimensions)
<i>NB</i>	
<i>OB</i>	
<i>PB</i>	
<i>RB</i>	
<i>SB</i>	Mounting holes diameter (MS 2 — MDS 2)
<i>TB</i>	Distance between mounting holes (AB4)
<i>UB</i>	Envelope distance (MP 1 — MP 2 — MP 7)
<i>VB</i>	
<i>WB</i>	Distance between TRP and mounting face (MF 7 — MDF 7)
<i>XB</i>	Distance between hole pin and key way (AB7 — AB5 — AB3)
<i>YB</i>	
<i>ZB</i>	Distance between TRP and cap end extremity (general dimensions)

Table 4 (continued)

Symbol 2nd letter	Designation
<i>C</i>	
<i>AC</i>	
<i>BC</i>	
<i>CC</i>	
<i>DC</i>	Groove depth clevis bracket (AA4-L — AA6-L)
<i>EC</i>	
<i>FC</i>	Pitch circle diameter (MF 3 — MDF 3 — MF 4 — MF 7 — MDF 7)
<i>GC</i>	
<i>HC</i>	
<i>JC</i>	
<i>KC</i>	Groove depth for key way (MS 2 — MDS2 — AB3 — AT4)
<i>LC</i>	
<i>MC</i>	
<i>NC</i>	
<i>OC</i>	
<i>PC</i>	
<i>RC</i>	Distance between mounting holes (AB4)
<i>SC</i>	
<i>TC</i>	Distance between trunnion bases (MT 1 — MDT 1 — MT 2 — MT 5 — MT 6)
<i>UC</i>	Envelope diameter (MF 3 — MDF 3 — MF 4 — MF 7 — MDF 7)
<i>VC</i>	Extension of pilot on flange (MF 7 — MDF 7)
<i>WC</i>	Distance between TRP and mounting face (MF 3 — MDF 3)
<i>XC</i>	Distance between TRP and pivot axis (MP 1 — MP 3)
<i>YC</i>	
<i>ZC</i>	

Table 4 (continued)

Symbol 2nd letter	Designation
<i>D</i>	
<i>AD</i>	Dimension of trunnion holder (MT 4 — MDT 4 — MT 5 — MT 6)
<i>BD</i>	
<i>CD</i>	Diameter of pivot hole (MP 1 — MP 2 — MP 3 — MP 4 — MP 7)
<i>DD</i>	Thread size (MX 1 — MDX 1 — MX 2 — MDX 2 — MX 3 — MX 4 — MDX 4 — MX 7 — MDX 7)
<i>ED</i>	
<i>FD</i>	Pitch circle diameter of holes (ME 7 — MDE 7 — ME 8 — MB 2 — MDB 2)
<i>GD</i>	
<i>HD</i>	
<i>JD</i>	
<i>KD</i>	
<i>LD</i>	
<i>MD</i>	
<i>ND</i>	
<i>OD</i>	Diameter for reducing length of centring RD (ME5 — MDE5 — ME7 — MDE7 — ME9 — MDE9 — ME11 — MDE11)
<i>PD</i>	
<i>RD</i>	Diameter of retainer plate (ME 5 — MDE 5 — ME 7 — MDE 7 — ME 9 — MDE 9 — ME 11 — MDE 11)
<i>SD</i>	Diameter of hole (AA4-S — AA6-S)
<i>TD</i>	Diameter of trunnion pins (MT 1 — MDT 1 — MT 2 — MT 4 — MDT 4 — MT 5 — MT 6)
<i>UD</i>	Envelope length (AB2)
<i>VD</i>	Pilot extension past retainer plate (general dimensions — MB 1 — MDB 1 — MB 2 — MDB 2 — ME 5 — MDE 5 — ME 7 — MDE 7 — ME 9 — MDE 9 — ME 11 — MDE 11)
<i>WD</i>	Diameter hole for hook wrench holes (rod end dimensions)
<i>XD</i>	Distance between TRP and pivot axis (MP 2 — MP 4)
<i>YD</i>	
<i>ZD</i>	

Table 4 (continued)

Symbol 2nd letter <i>E</i>	Designation
<i>AE</i>	Groove width (rod end dimensions)
<i>BE</i>	Mounting thread size (MR 3 — MDR 3 — MR 4)
<i>CE</i>	Distance between TRP and pivot axis (AP2)
<i>DE</i>	
<i>EE</i>	Port size (tapped, general dimensions)
<i>FE</i>	Pitch diameter of mounting holes (AF3)
<i>GE</i>	
<i>HE</i>	
<i>JE</i>	
<i>KE</i>	Depth of tapped mounting holes (AF3)
<i>LE</i>	Clearance around pivot axis (AB2 — AB3 — AB4 — AP2 — AP4) (rod end dimensions)
<i>ME</i>	Thickness of flange (MF 5 — MDF 5 — MF 6)
<i>NE</i>	Width of rod flange (AF3)
<i>OE</i>	
<i>PE</i>	
<i>RE</i>	Distance between mounting holes (AB5 — AB6)
<i>SE</i>	
<i>TE</i>	Transversal distance between mounting holes (AB7)
<i>UE</i>	Envelope diameter (ME 7 — MDE 7 — ME 8)
<i>VE</i>	Head end pilot extension past head (general dimensions, $VE = VD + F$)
<i>WE</i>	Distance between TRP and mounting face (MF 5 — MDF 5)
<i>XE</i>	
<i>YE</i>	
<i>ZE</i>	

Table 4 (continued)

Symbol 2nd letter <i>F</i>	Designation
<i>AF</i>	Thread length of tapped rod end (rod end dimensions)
<i>BF</i>	Length of mounting screw (MR 3 — MDR 3 — MR 4)
<i>CF</i>	Diameter of pivot hole (AB5 — AB6)
<i>DF</i>	
<i>EF</i>	Clearance radius of pivot axis (AP6)
<i>FF</i>	Flange port size (general dimensions)
<i>GF</i>	
<i>HF</i>	
<i>JF</i>	Thickness of flange (MF8)
<i>KF</i>	Thread size in tapped rod end (rod end dimensions)
<i>LF</i>	Clearance around pivot axis (AP6)
<i>MF</i>	Thickness of flange (MF 1 — MDF 1 — MF 2)
<i>NF</i>	Thickness of flange (MF 3 — MDF 3 — MF 4 — MF 7 — MDF 7)
<i>OF</i>	Distance from spot face to head of brackets (AB7)
<i>PF</i>	
<i>RF</i>	Distance of mounting holes (AB3)
<i>SF</i>	Width of wrench flat (rod end dimensions)
<i>TF</i>	Distance between mounting holes (ME 11 — MDE 11 — ME 12 — MF 1 — MDF 1 — MF 2 — MF 5 — MDF 5 — MF 6 — MF 8)
<i>UF</i>	Envelope length (MF1 — MDF 1 — MF 2 — MF 5 — MDF 5 — MF 6 — MF 8)
<i>VF</i>	
<i>WF</i>	Distance between TRP and head of mounting face (general dimensions — MB 1 — MDB 1 — MB 2 — MDB 2 — ME 5 — MDE 5 — ME 7 — MDE 7 — ME 9 — MDE 9 — ME 11 — MDE 11 — MR 3 — MDR 3)
<i>XF</i>	
<i>YF</i>	
<i>ZF</i>	Distance between TRP and back face of rear flange (MF 2)

Table 4 (continued)

Symbol 2nd letter <i>G</i>	Designation
<i>AG</i>	Dimension from TRP to shoulder of the piston (Figure 6)
<i>BG</i>	Depth of tapped mounting holes (MX 5 — MDX 5 — MX 6 — MX 7 — MDX 7 — MX 8 — MDX 8)
<i>CG</i>	Clevis bracket for spherical bearing slot (AB5 — AB6)
<i>DG</i>	Clearance around pivot axis (AB5)
<i>EG</i>	
<i>FG</i>	Distance between studs and mounting holes (AB3)
<i>GG</i>	
<i>HG</i>	
<i>JG</i>	
<i>KG</i>	
<i>LG</i>	Clearance around pivot axis (AB6)
<i>MG</i>	
<i>NG</i>	
<i>OG</i>	
<i>PG</i>	
<i>RG</i>	Distance of mounting bolts (AB3)
<i>SG</i>	Threaded depth for screw locking plate
<i>TG</i>	Distance between studs or tie rods (MX 1 — MDX 1 — MX 2 — MDX 2 — MX 3 — MX 4 — MDX 4 — MX 5 — MDX 5 — MX 6 — MX 7 — MDX 7 — MX 8 — MDX 8)
<i>UG</i>	Envelope length (ME 9 — MDE 9 — ME 10 — ME 11 — MDE 11 — ME 12)
<i>VG</i>	
<i>WG</i>	Depth of holes for hook wrench (rod end dimensions)
<i>XG</i>	Distance between TRP and trunnion axis (MT 1 — MDT 1)
<i>YG</i>	
<i>ZG</i>	Distance between mounting face and opposite rod shoulder (MDE 5 — MDE 7 — MDE 9 — MDE 11 — MDR 3)