# International Standard ISO 6099

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

# 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*

**First edition — 1982-12-15**



**UDC 621.226** **Ref. No. ISO 6099-1982 (E)**

**Descriptors** : fluid power, hydraulic fluid power, pneumatic fluid power, hydraulic cylinders, pneumatic cylinders, mountings, mounting flanges, dimensions, designation.

Price based on 45 pages

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 6099 was developed by Technical Committee ISO/TC 131, *Fluid power systems*, and was circulated to the member bodies in July 1981.

It has been approved by the member bodies of the following countries:

| | | |
|---|---|---|
| Australia | France | Romania |
| Austria | Germany, F.R. | Spain |
| Belgium | Hungary | Sweden |
| Canada | India | Switzerland |
| China | Mexico | United Kingdom |
| Czechoslovakia | Netherlands | USA |
| Egypt, Arab Rep. of | Norway | USSR |
| Finland | Poland | |

No member body expressed disapproval of the document.





Printed in Switzerland

# Contents

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



## 0 Introduction

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

One component of such systems 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.

## 1 Scope and field of application

This International Standard specifies a conventional system for identifying fluid power cylinder dimensions and mounting dimensions thereof. Such a system will be composed of :

a) a letter code for identifying

- mounting dimensions
- envelope dimensions
- cylinder fitting dimensions;

b) a code for identifying cylinder mounting types.

This International Standard does not represent a standard list of all cylinder mounting types.

The codes indicated in this International Standard are also not to be considered as complete for the development of future interchangeability standards. It establishes uniform descriptions for dimensions and achieves a conformity of language.

Although this International Standard presents a code and a method of dimensioning, it is not intended that all dimensions shall be standardized.

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

## 2 Reference

ISO 5598, *Fluid power systems and components — Vocabulary.* [1)]

## 3 Definitions

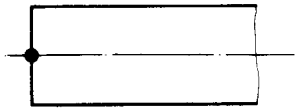
For definitions of terms used, see ISO 5598.

1) At present at the state of draft.

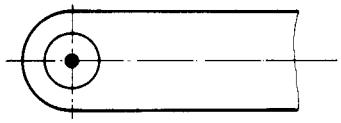
## 4 Reference point

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

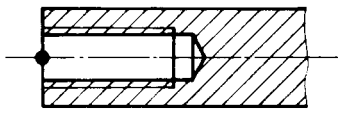
**4.1** For a plain rod end, the reference point is located on the rod centreline at the end of the piston rod :



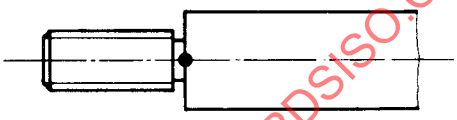
**4.2** For a pin rod end, the reference point is located at the intersection of the pin centreline and of the piston rod centre line :



**4.3** For a female threaded rod end, the reference point is located on the rod centreline at the end of the piston rod :



**4.4** For a male threaded rod end, the reference point is located on the rod centreline, at the shoulder level :



**4.5** New types of rod ends can be introduced later as required.

## 5 Letter codes for identifying cylinder mounting, envelope and accessory dimensions

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

The meaning of the letters and of the sign $+$ is the following :

### 5.1 Letter $Z$

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

### 5.2 Letter $U$

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

### 5.3 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.

### 5.4 Letter $H$

Any group of two letters ending with $H$ identifies the cylinder centre height with respect to its mounting plane.

### 5.5 Sign +

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

$ZJ+$ = $ZJ$ plus stroke

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

$ZM++$ = $ZM$ plus two times the stroke

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

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

## 5.6 Dimensioning

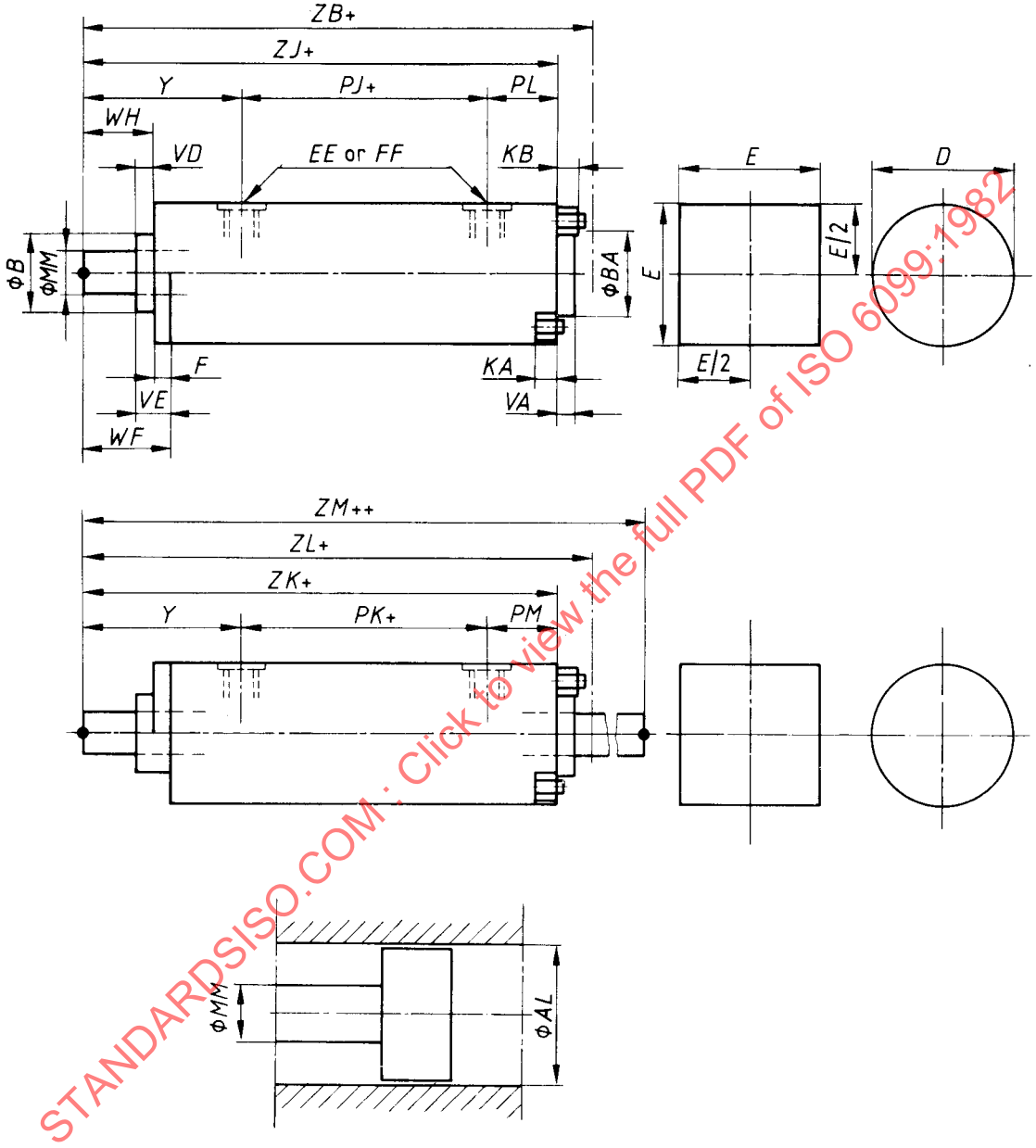



Figure 1 — General dimensions arrangement by cylinders

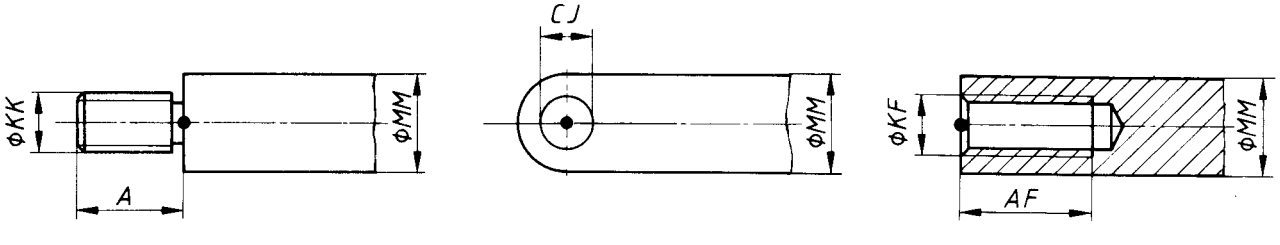
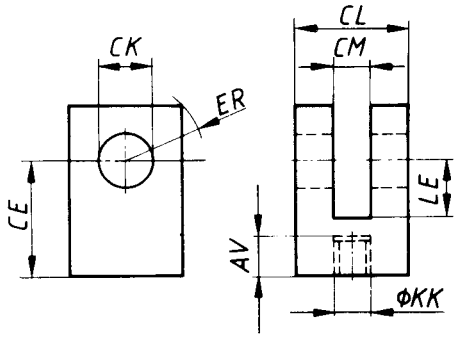
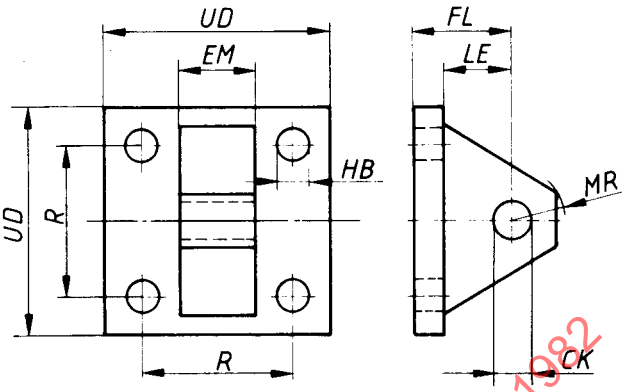


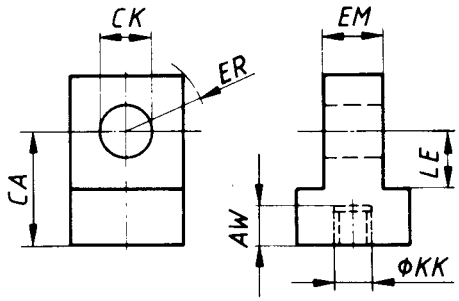

Figure 2 — Rod end dimensions



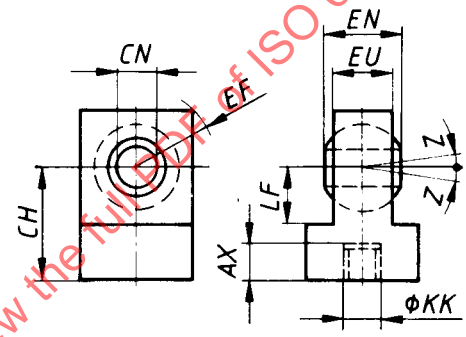

a) Rod clevis



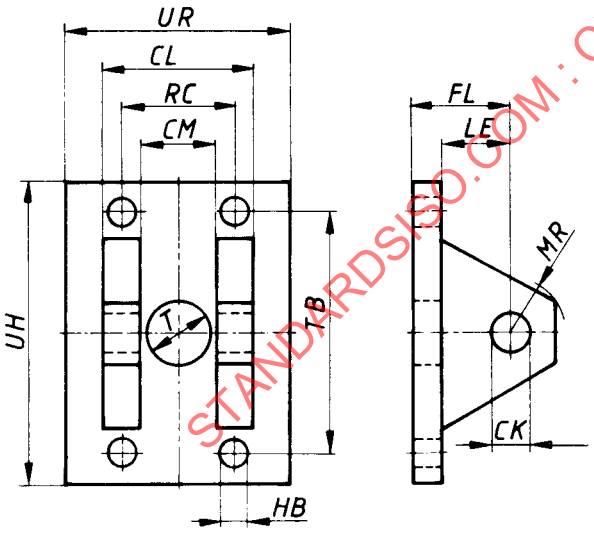

b) Eye bracket



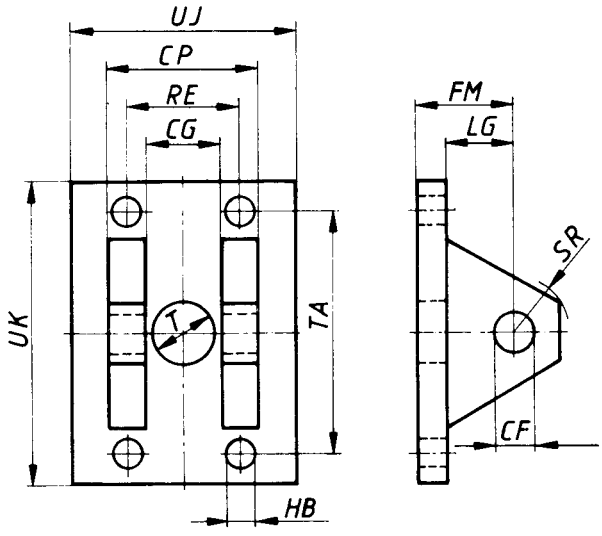

c) Rod eye plain



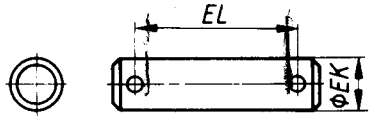

d) Rod eye with spherical plain bearing



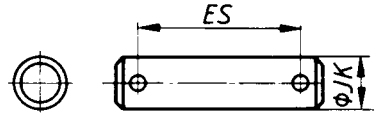

e) Clevis bracket




f) Clevis bracket for spherical plain bearing




g) Pivot pin, plain (Cotter pin or snap ring type)




h) Pivot pin, spherical plain bearing (Cotter pin or snap ring type)

Figure 3 — Cylinder accessories

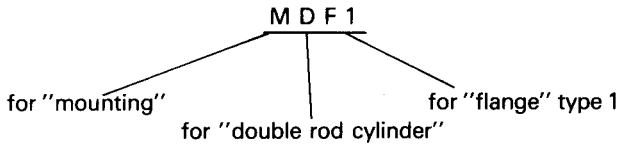
## 6 Identification code for mounting types

### 6.1 General

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

*Example* :


*Example* :




The following letters may be substituted for the letter designating flanges in the examples above :

| Letter | Mounting type |
|---|---|
| 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 following types of mounting are defined in this International Standard :

ME 5 Head rectangular (Figure 4)
MDE 5 Head rectangular — Double rod (Figure 5)
ME 6 Cap rectangular (Figure 6)
ME 7 Head round (Figure 7)
MDE 7 Head round — Double rod (Figure 8)
ME 8 Cap round (Figure 9)
ME 9 Head square (Figure 10)
MDE 9 Head square — Double rod (Figure 11)
ME 10 Cap square (Figure 12)
MF 1 Head rectangular flange (Figure 13)
MDF 1 Head rectangular flange — Double rod (Figure 14)
MF 2 Cap rectangular flange (Figure 15)
MF 3 Head circular flange (Figure 16)
MDF 3 Head circular flange — Double rod (Figure 17)
MF 4 Cap circular flange (Figure 18)
MF 5 Head square flange (Figure 19)
MDF 5 Head square flange — Double rod (Figure 20)
MF 6 Cap square flange (Figure 21)
MF 7 Head circular flange centred on the rearside (Figure 22)
MDF 7 Head circular flange centred on the rearside — Double rod (Figure 23)
MP 1 Cap fixed clevis (Figure 24)
MP 2 Cap detachable clevis (Figure 25)
MP 3 Cap fixed eye (Figure 26)
MP 4 Cap detachable eye (Figure 27)
MP 5 Cap fixed eye with spherical plain bearing (Figure 28)
MP 6 Cap detachable eye with spherical plain bearing (Figure 29)
MP 7 Head detachable clevis (Figure 30)
MR 3 Head threaded (Figure 31)
MDR 3 Head threaded — Double rod (Figure 32)
MR 4 Cap threaded (Figure 33)
MS 1 End angles (Figure 34)
MDS 1 End angles — Double rod (Figure 35)
MS 2 Side lugs (Figure 36)
MDS 2 Side lugs — Double rod (Figure 37)
MT 1 Head integral trunnion (male) (Figure 38)
MDT 1 Head integral trunnion (male) — Double rod (Figure 39)
MT 2 Cap integral trunnion (male) (Figure 40)
MT 4 Intermediate fixed or movable trunnion (male) (Figure 41)
MDT 4 Intermediate fixed or movable trunnion (male) — Double rod (Figure 42)
MT 5 Head detachable trunnion (male) (Figure 43)
MT 6 Cap detachable trunnion (male) (Figure 44)
MX 1 Both ends studs or tie rods extended (Figure 45)
MDX 1 Both ends studs or tie rods extended — Double rod (Figure 46)
MX 2 Cap studs or tie rods extended (Figure 47)
MDX 2 Cap studs or tie rods extended — Double rod (Figure 48)
MX 3 Head studs or tie rods extended (Figure 49)
MX 4 Both ends 2 studs or tie rods extended (Figure 50)
MDX 4 Both ends 2 studs or tie rods extended — Double rod (Figure 51)
MX 5 Head tapped (Figure 52)
MDX 5 Head tapped — Double rod (Figure 53)
MX 6 Cap tapped (Figure 54)

## 7 Letter codes of mounting and envelope dimensions according to cylinder mounting types

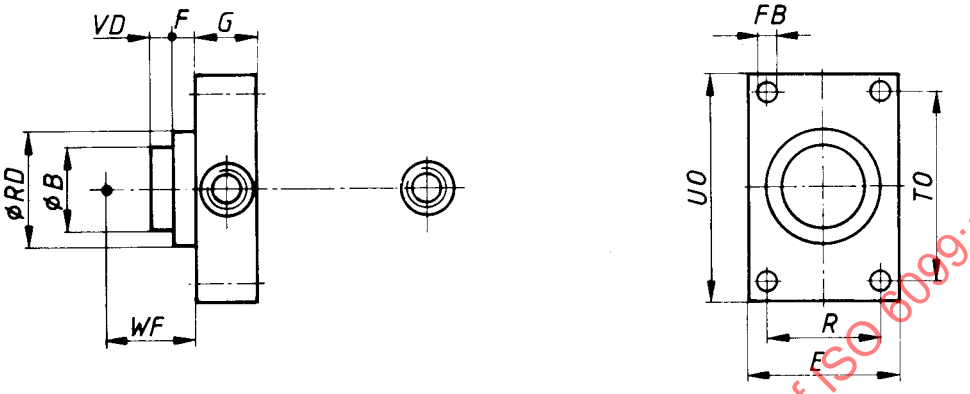



Figure 4 — (ME 5) Head, rectangular

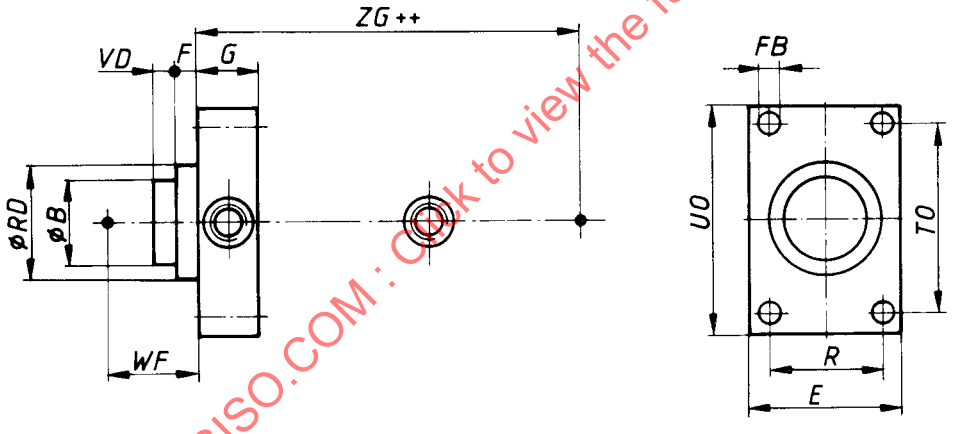



Figure 5 — (MDE 5) Head, rectangular — Double rod

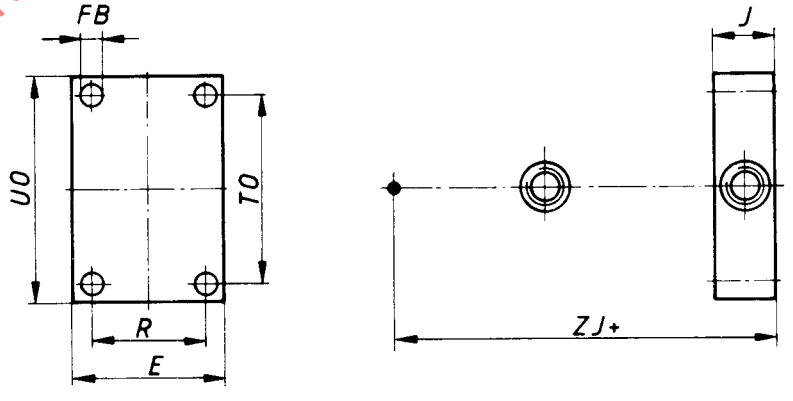



Figure 6 — (ME 6) Cap, rectangular

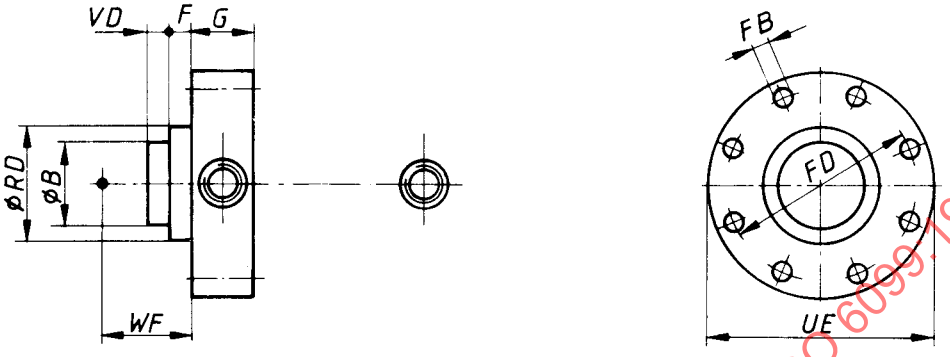



Figure 7 — (ME 7) Head, round

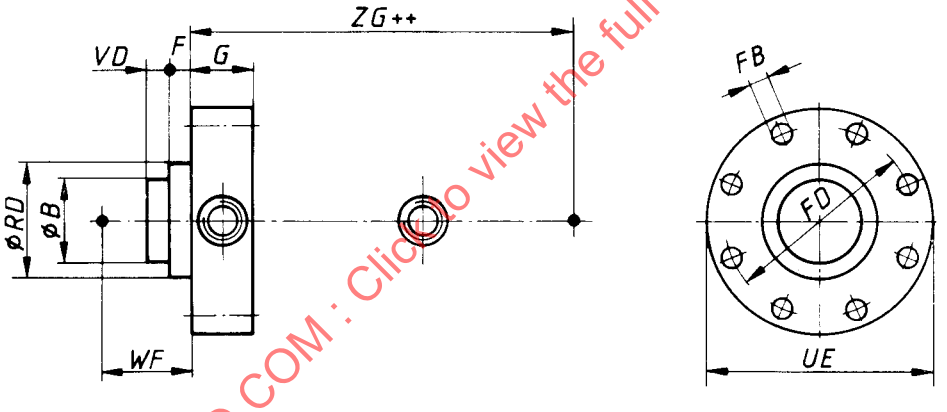



Figure 8 — (MDE 7) Head, round — Double rod

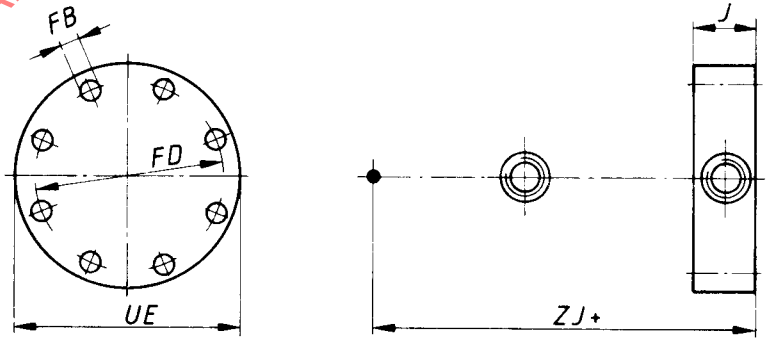



Figure 9 — (ME 8) Cap, round

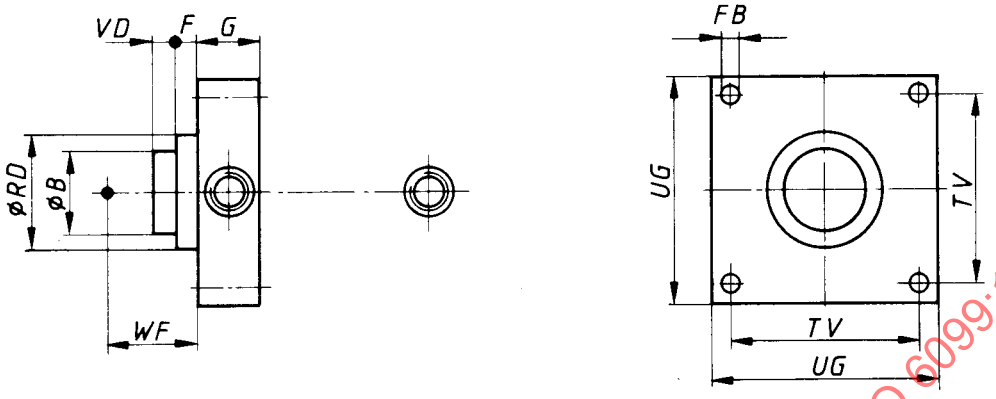



Figure 10 — (ME 9) Head, square

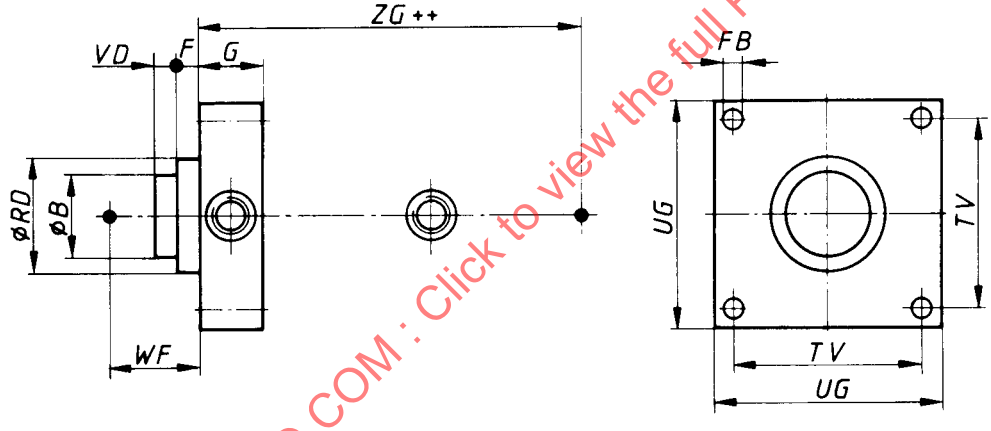



Figure 11 — (MDE 9) Head, square — Double rod

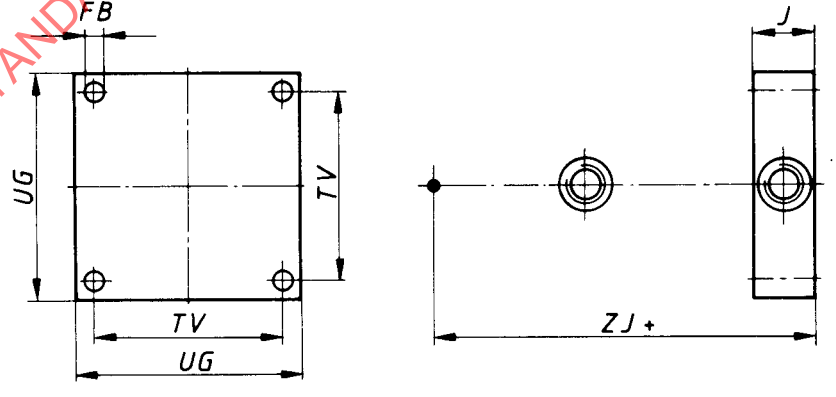



Figure 12 — (ME 10) Cap, square

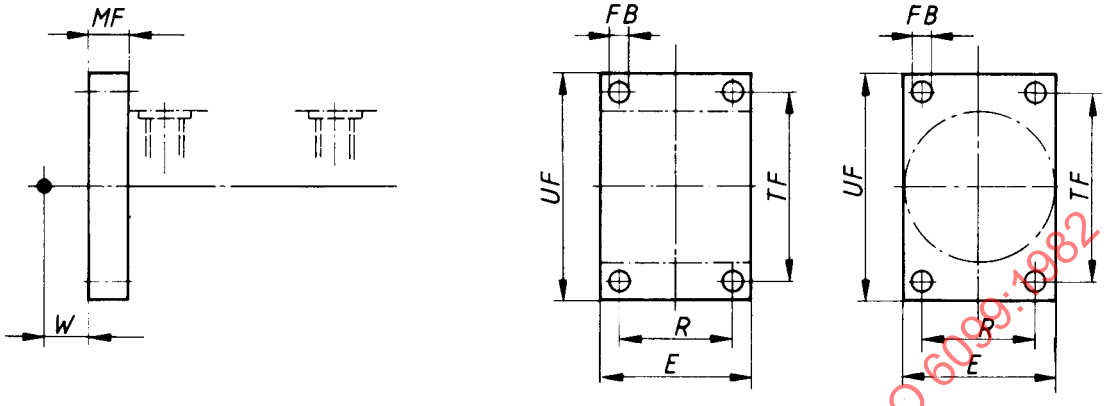



Figure 13 — (MF 1) Head, rectangular flange

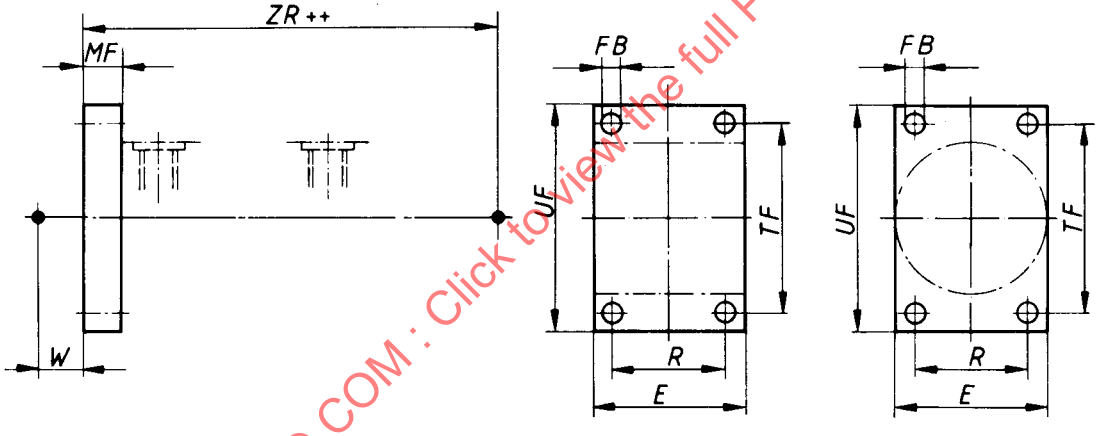



Figure 14 — (MDF 1) Head, rectangular flange — Double rod

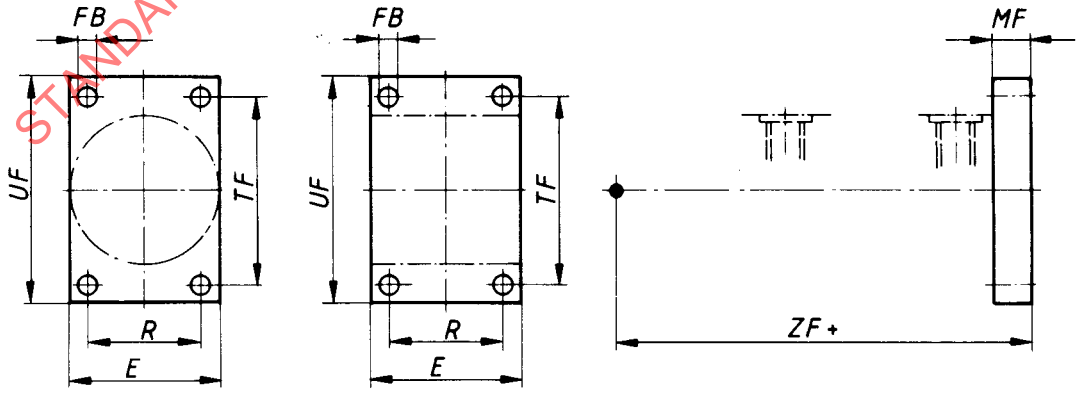



Figure 15 — (MF 2) Cap, rectangular flange

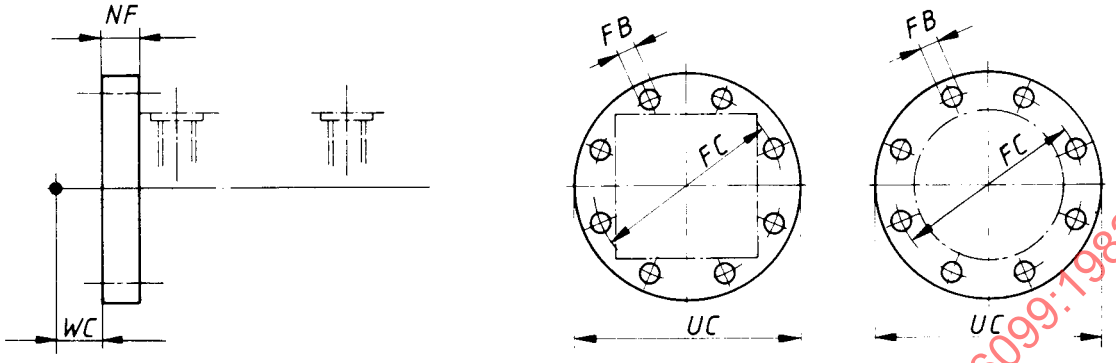



Figure 16 — (MF 3) Head, circular flange

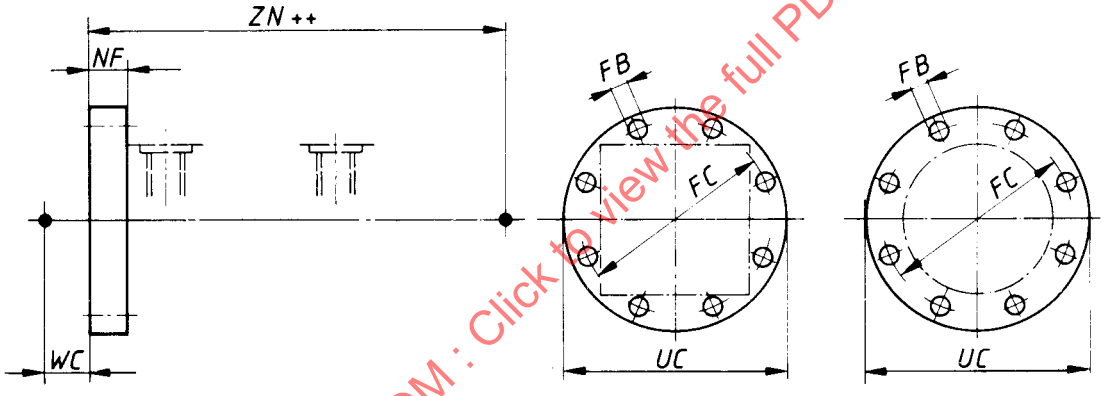



Figure 17 — (MDF 3) Head, circular flange — Double rod

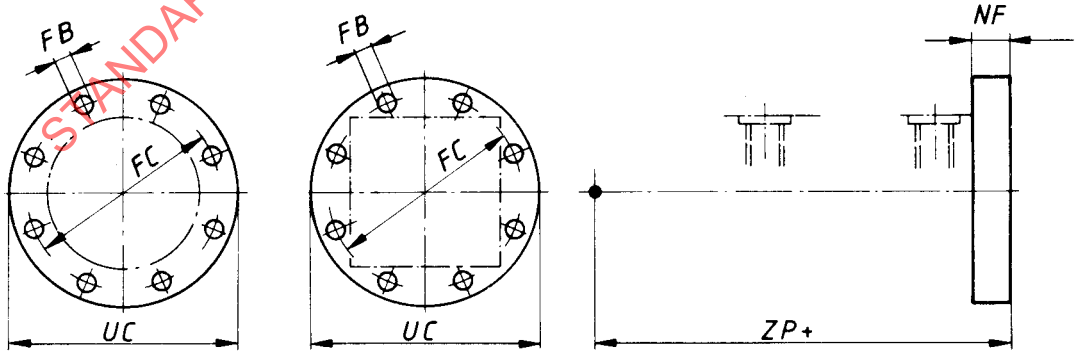



Figure 18 — (MF 4) Cap, circular flange

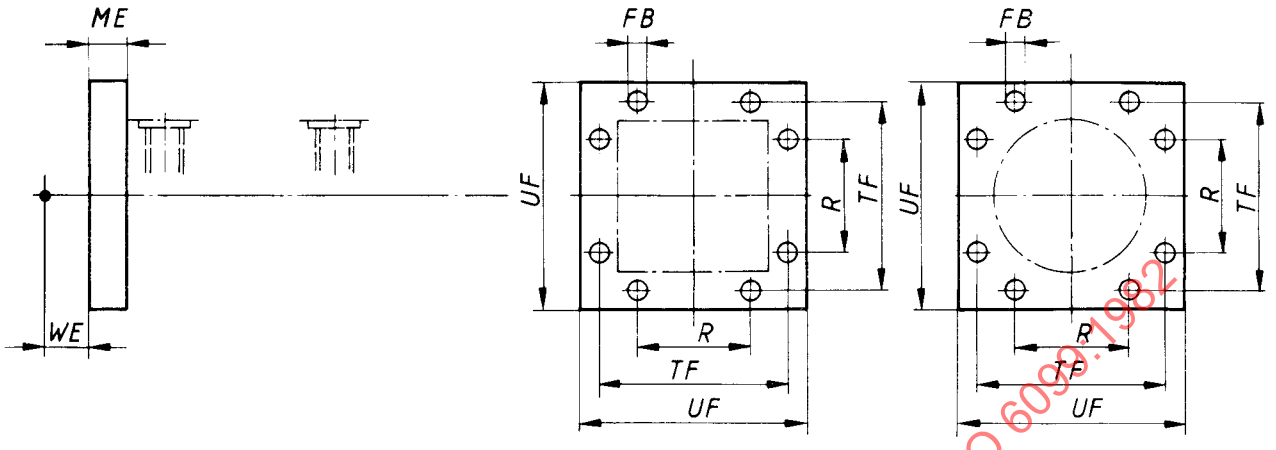



Figure 19 — (MF 5) Head, square flange

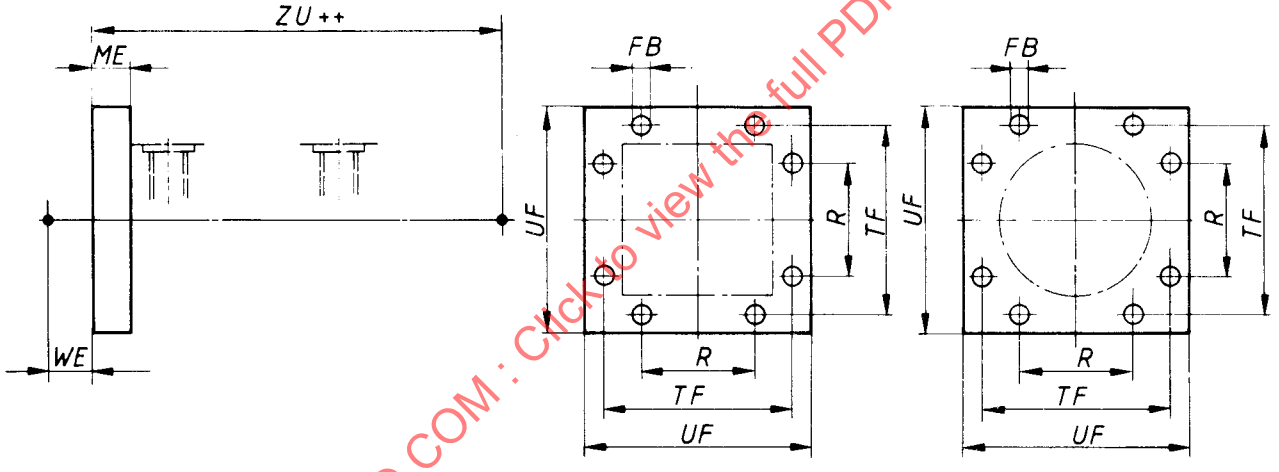



Figure 20 — (MDF 5) Head, square flange — Double rod

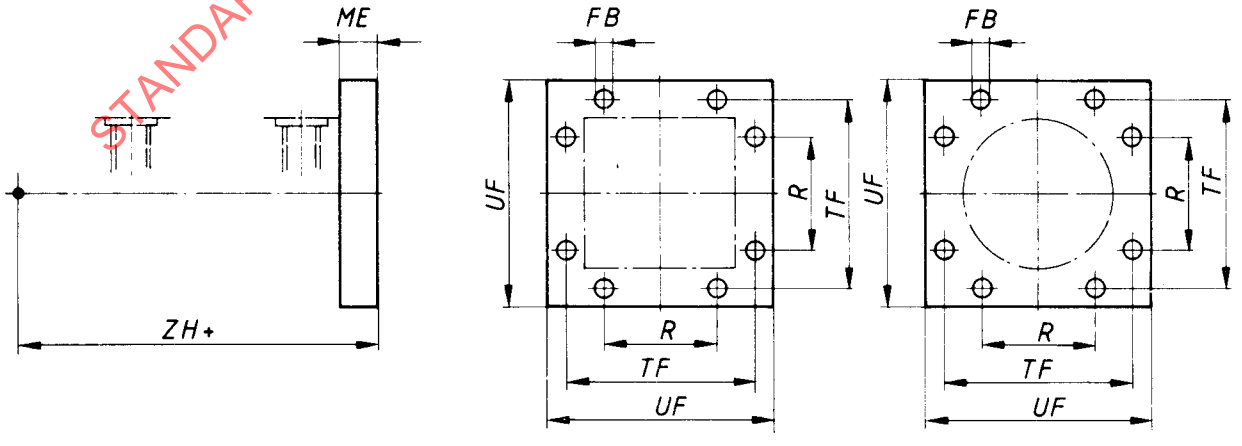



Figure 21 — (MF 6) Cap, square flange

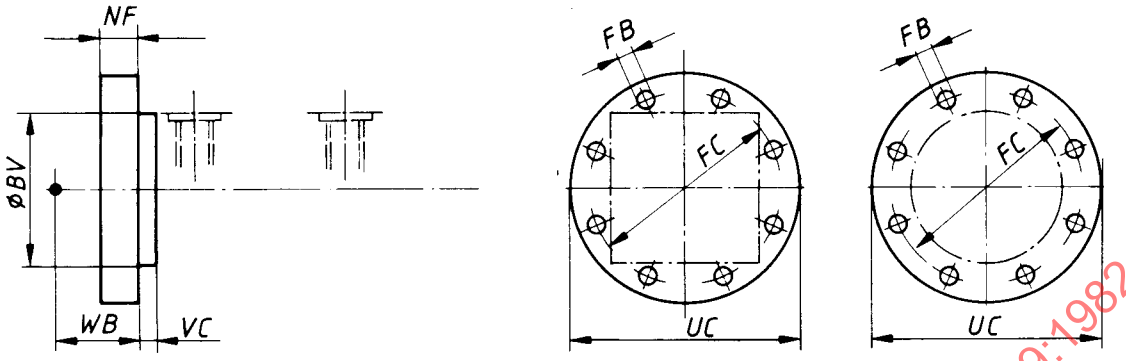



Figure 22 — (MF 7) Head circular flange centred on the rearside

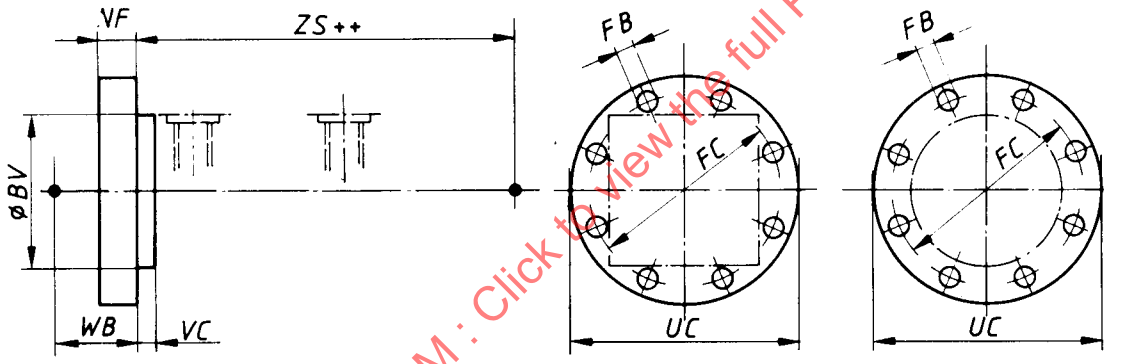



Figure 23 — (MDF 7) Head circular flange centred on the rearside — Double rod

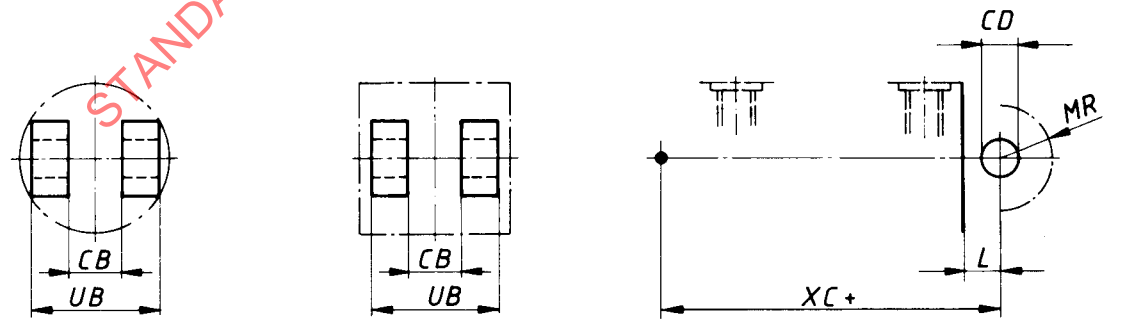



Figure 24 — (MP 1) Cap fixed clevis

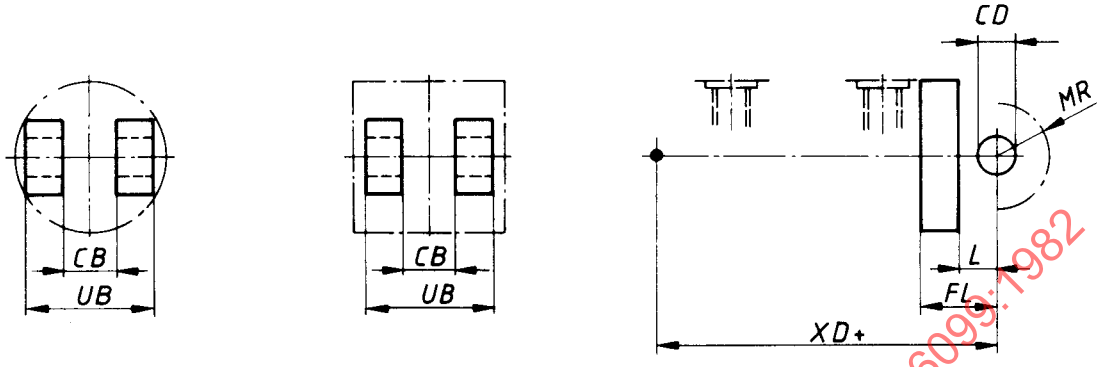



Figure 25 — (MP 2) Cap detachable clevis

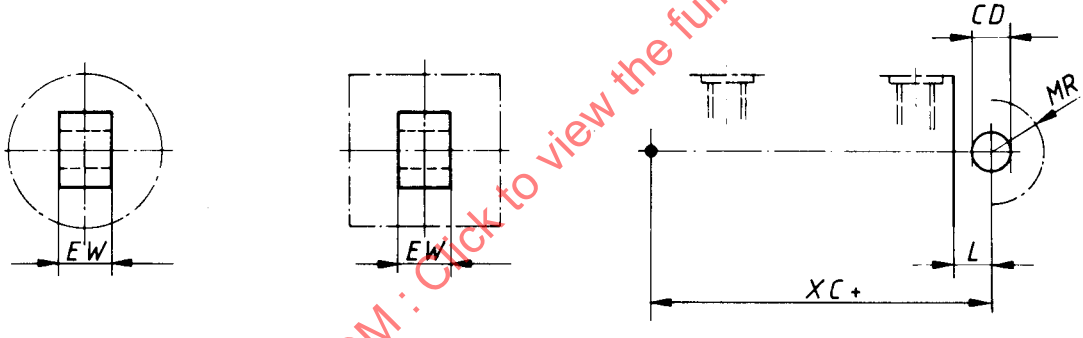



Figure 26 — (MP 3) Cap fixed eye

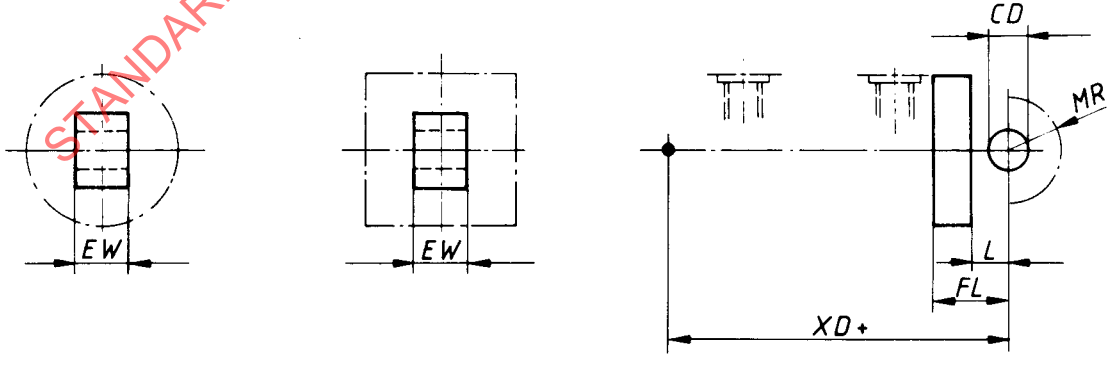



Figure 27 — (MP 4) Cap detachable eye

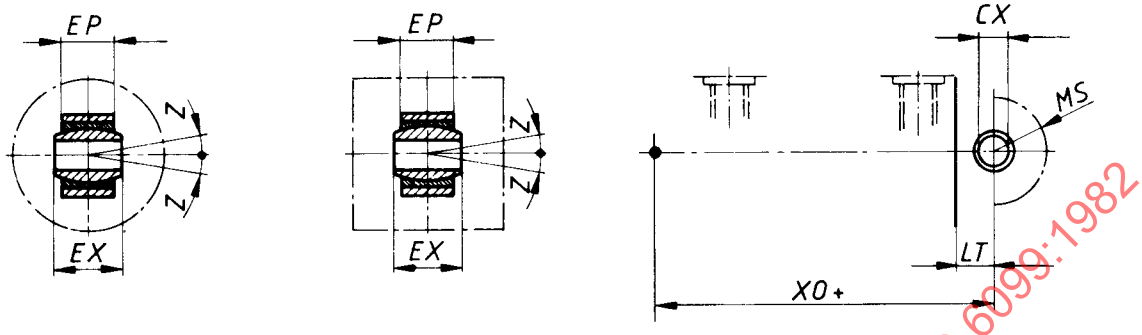



Figure 28 — (MP 5) Cap fixed eye with spherical plain bearing

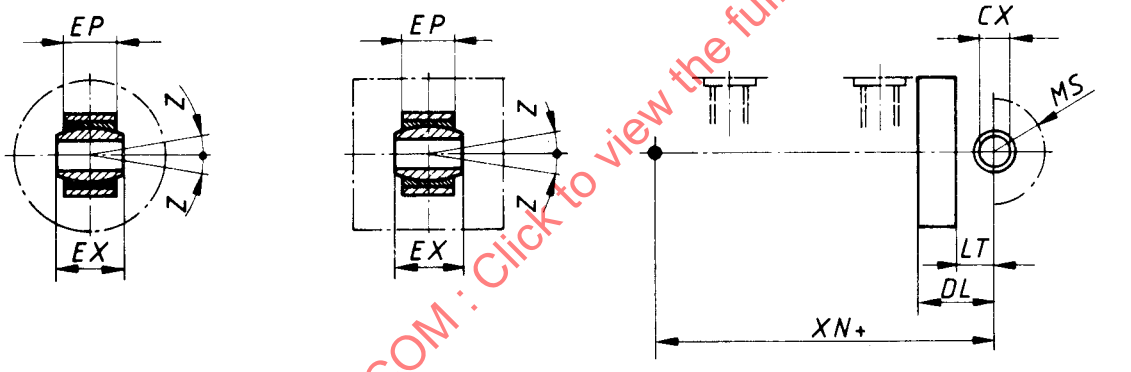



Figure 29 — (MP 6) Cap detachable eye with spherical plain bearing

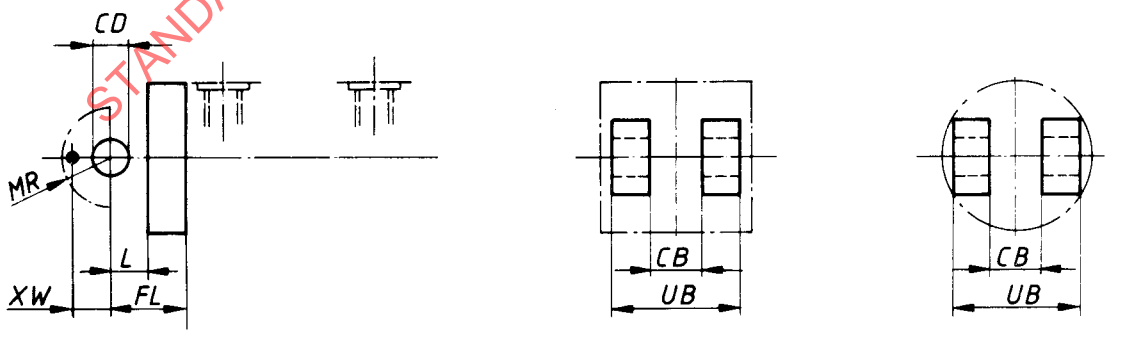



Figure 30 — (MP 7) Head detachable clevis

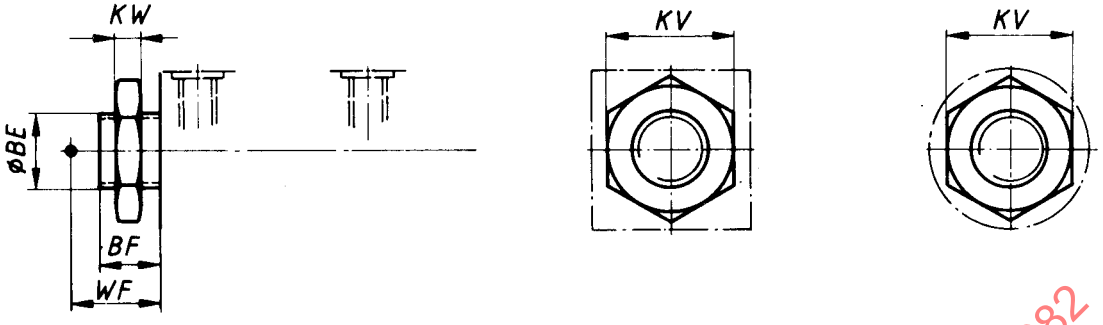



Figure 31 — (MR 3) Head, threaded

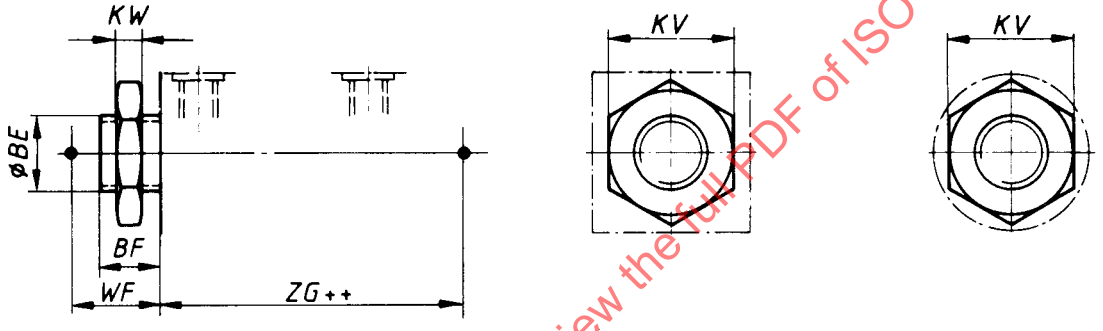



Figure 32 — (MDR 3) Head, threaded — Double rod

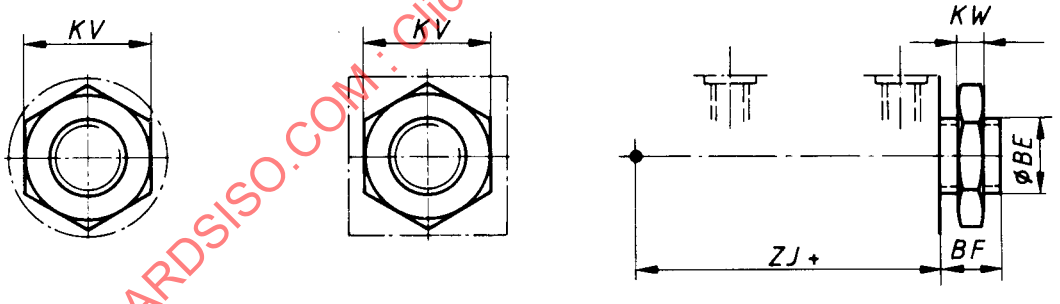



Figure 33 — (MR 4) Cap, threaded

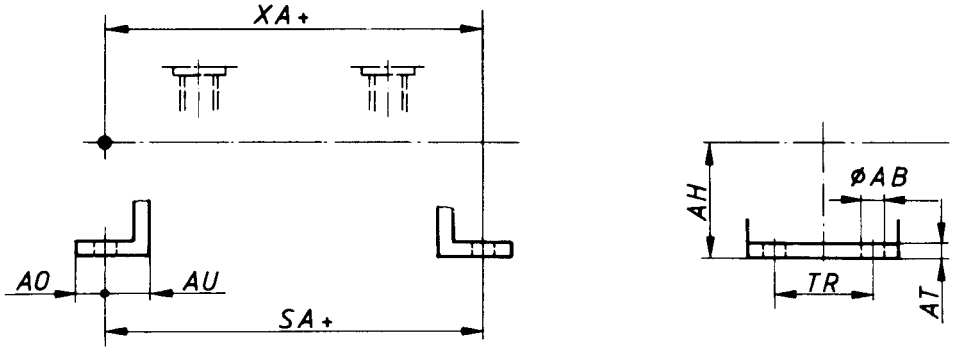



Figure 34 — (MS 1) End angles

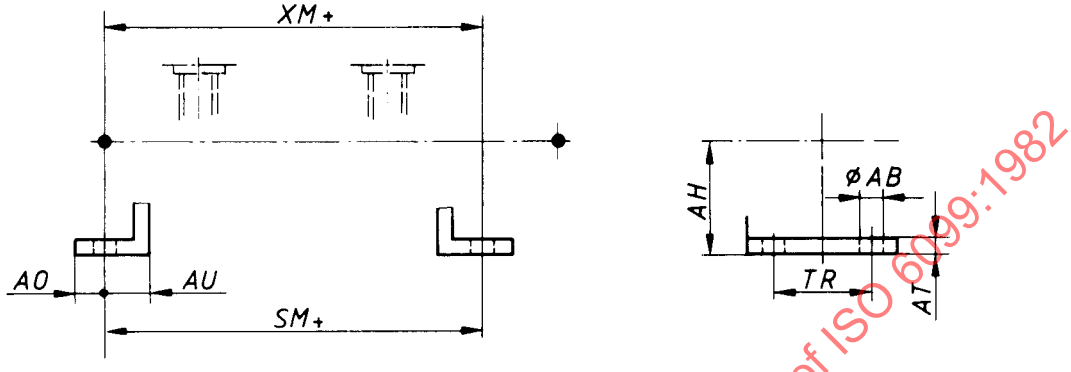



Figure 35 — (MDS 1) End angles — Double rod

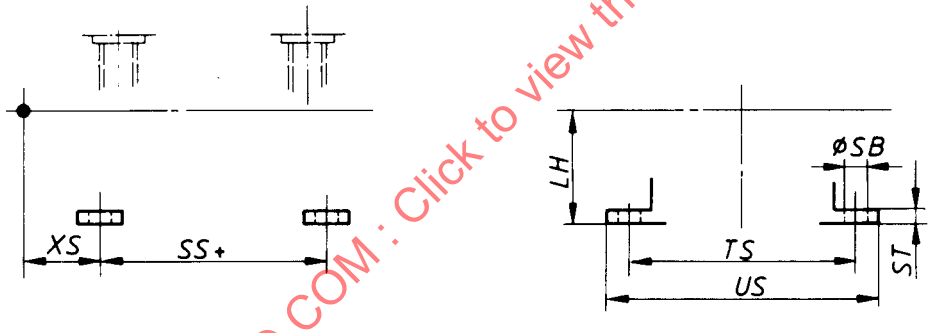



Figure 36 — (MS 2) Side lugs

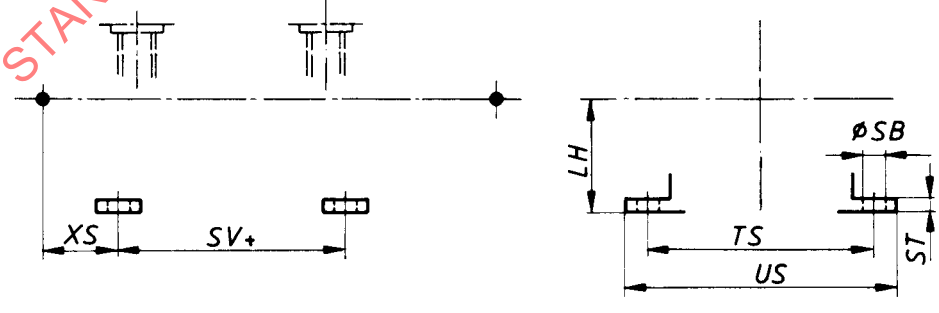



Figure 37 — (MDS 2) Side lugs — Double rod

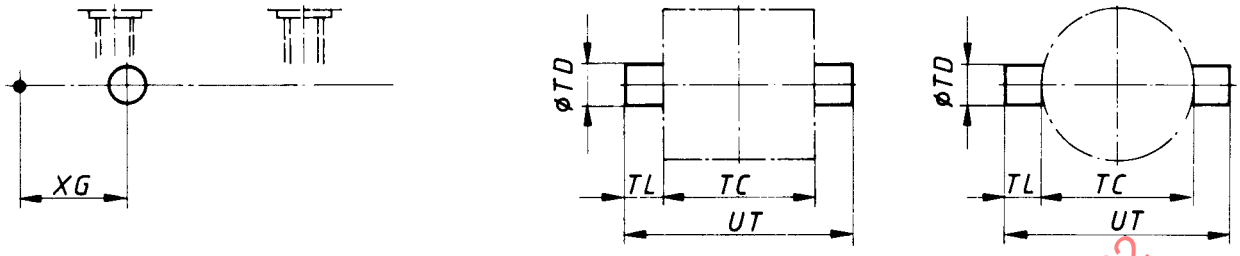



Figure 38 — (MT 1) Head integral trunnion (male)

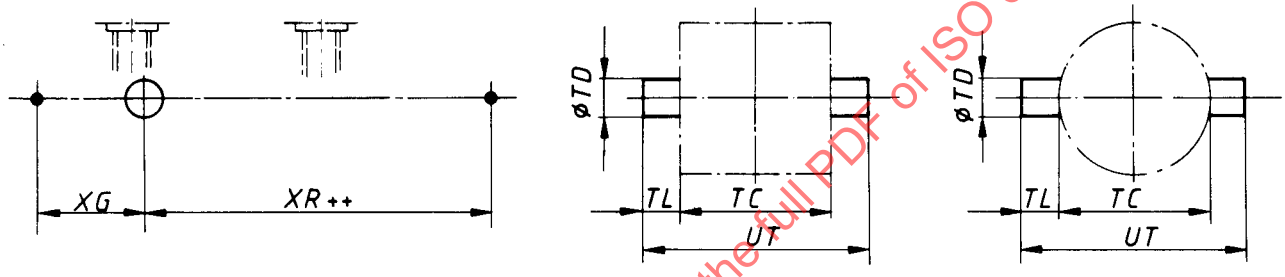



Figure 39 — (MDT 1) Head, integral trunnion (male) — Double rod

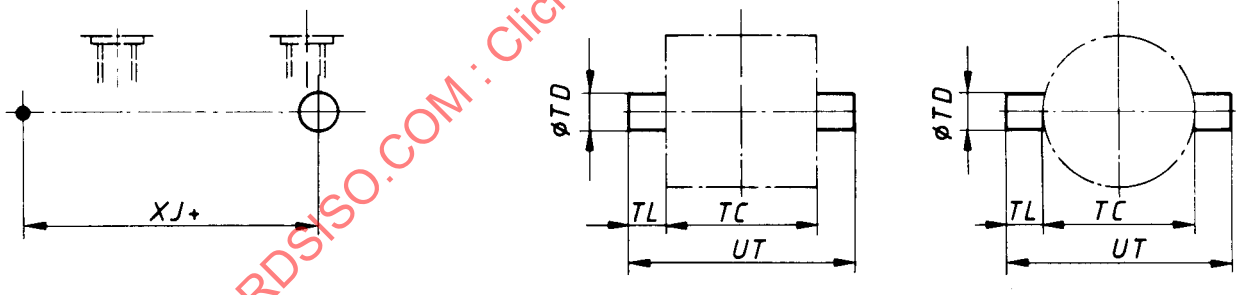



Figure 40 — (MT 2) Cap integral trunnion (male)

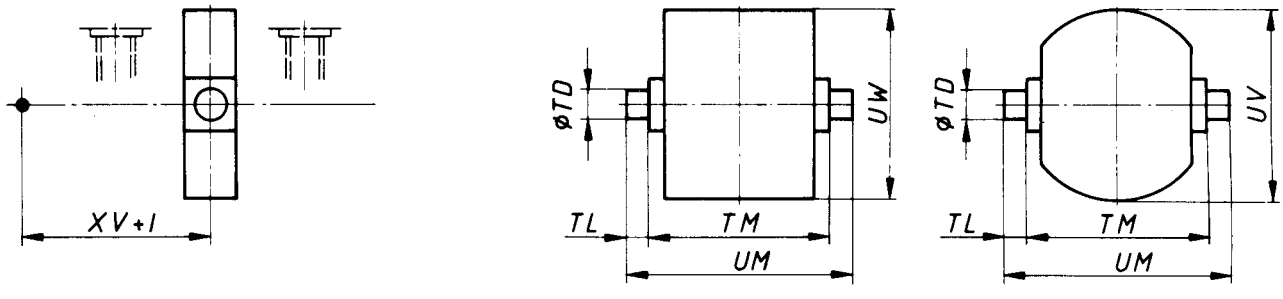



Figure 41 — (MT 4) Intermediate fixed or movable trunnion (male)

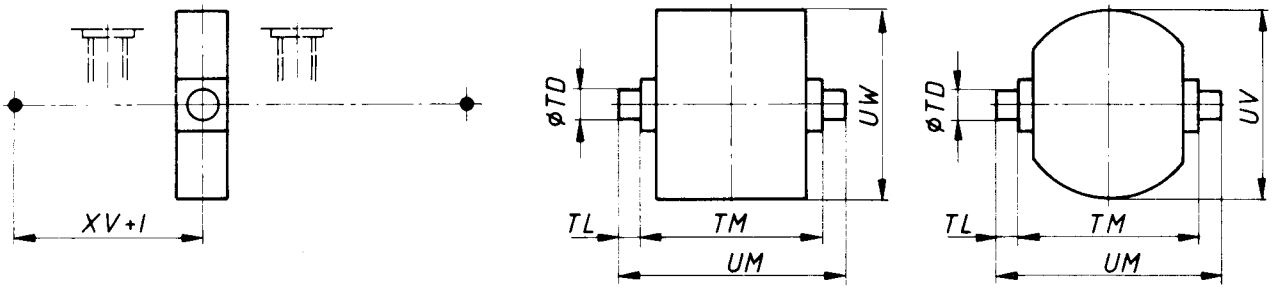



Figure 42 — (MDT 4) Intermediate fixed or movable trunnion (male) — Double rod

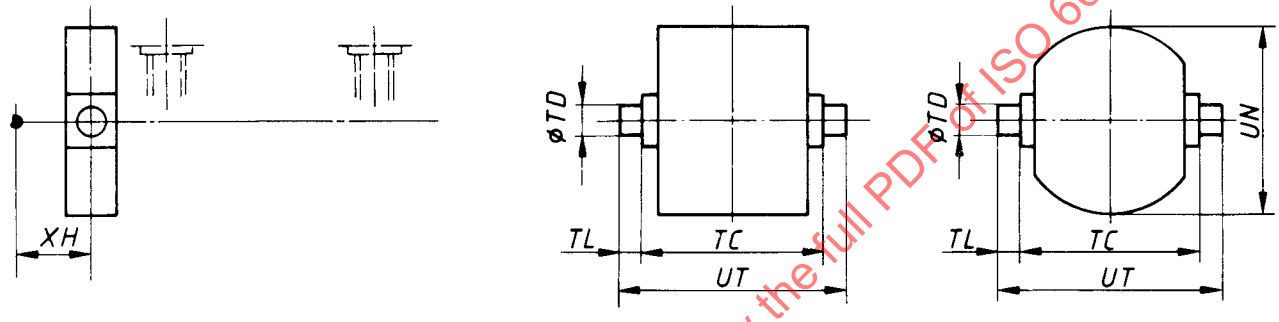



Figure 43 — (MT 5) Head detachable trunnion (male)

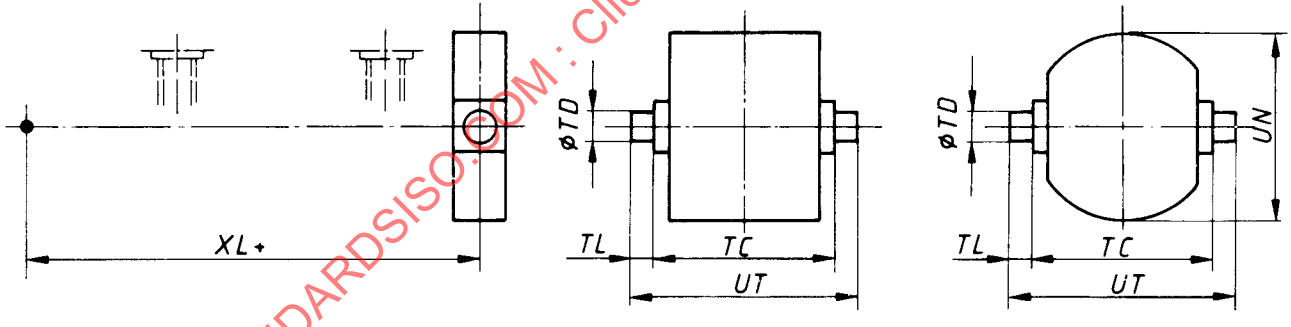



Figure 44 — (MT 6) Cap detachable trunnion (male)

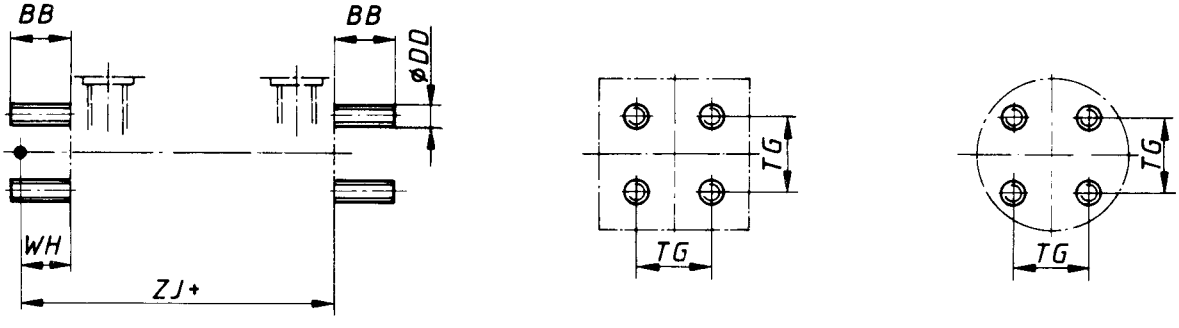



Figure 45 — (MX 1) Both ends studs or tie rods extended

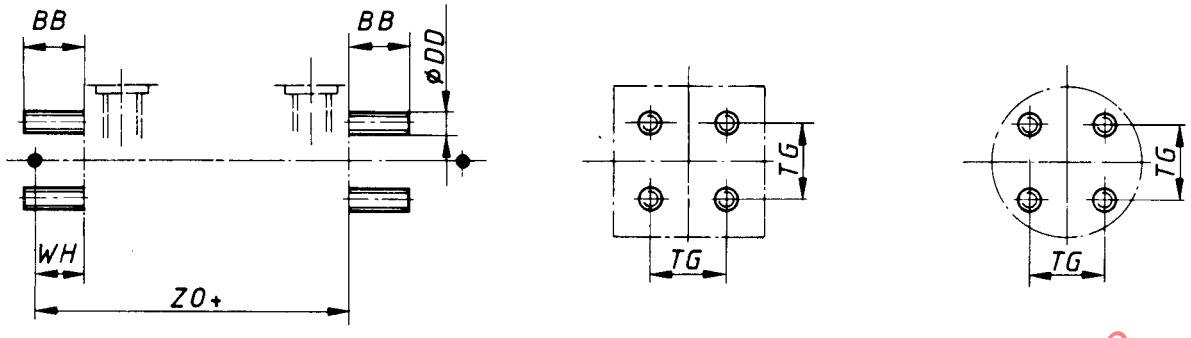



Figure 46 — (MDX 1) Both ends studs or tie rods extended — Double rod

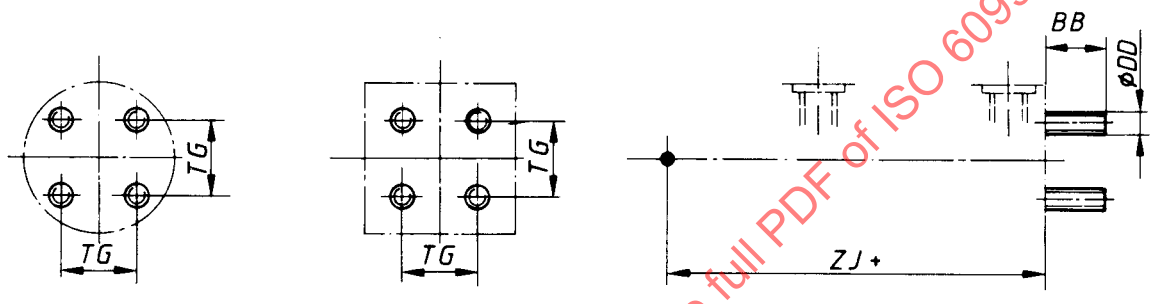



Figure 47 — (MX 2) Cap studs or tie rods extended

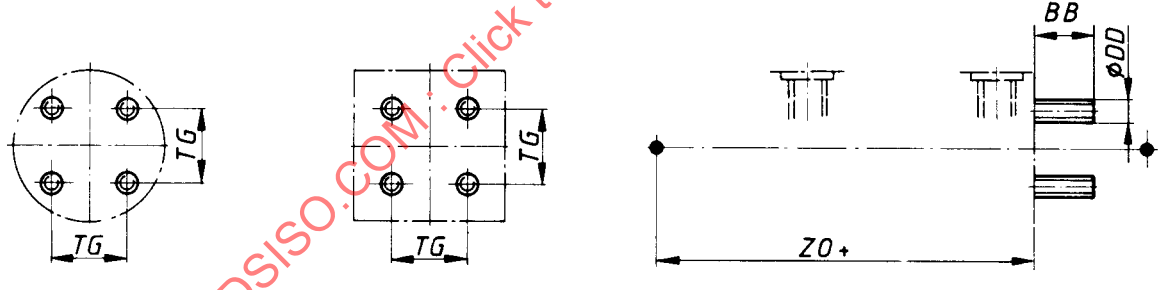



Figure 48 — (MDX 2) Cap studs or tie rods extended — Double rod

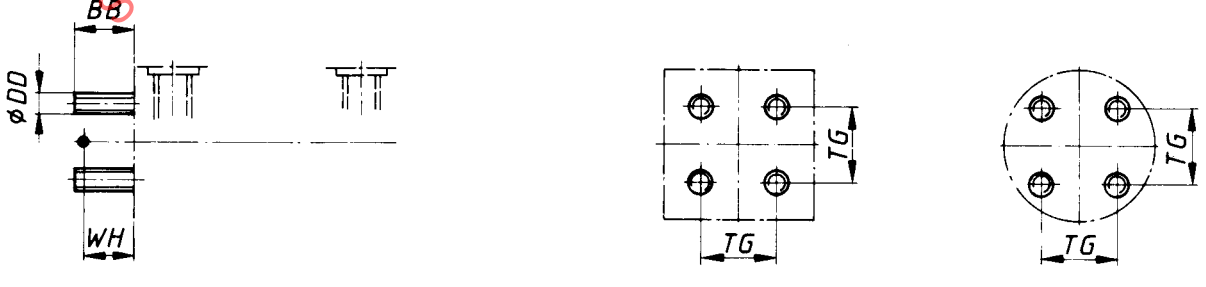



Figure 49 — (MX 3) Head studs or tie rods extended

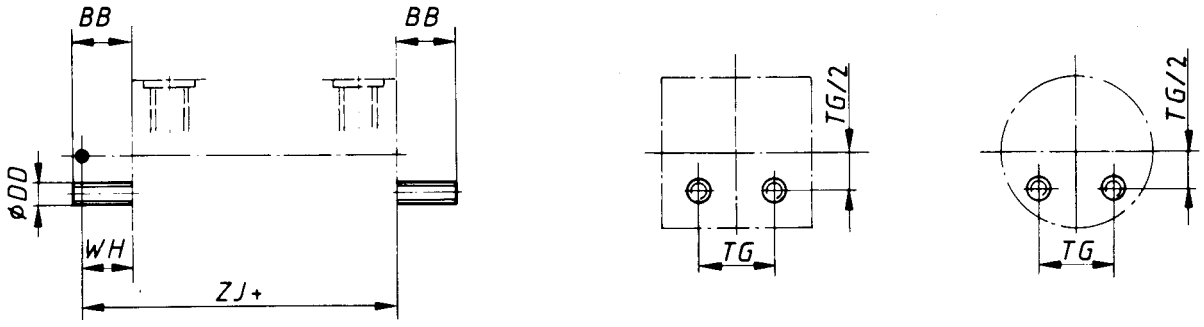



Figure 50 — (MX 4) Both ends 2 studs or tie rods extended

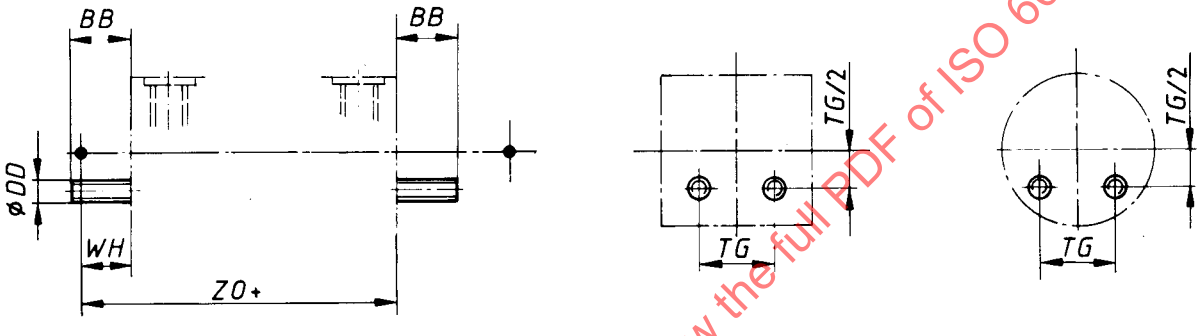



Figure 51 — (MDX 4) Both ends 2 studs or tie rods extended — Double rod

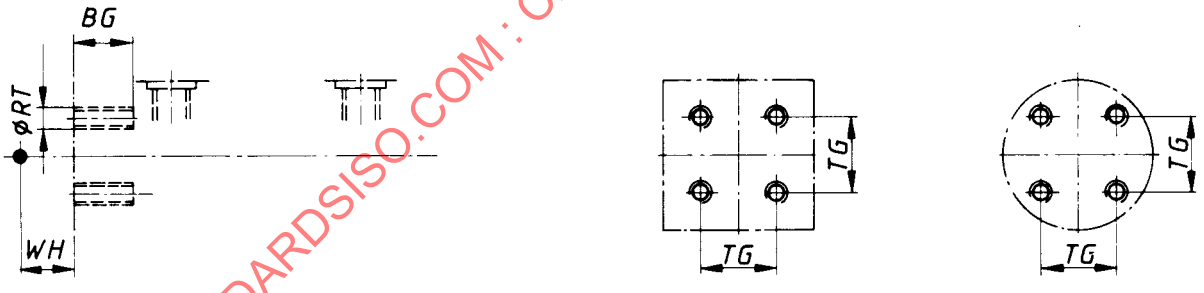



Figure 52 — (MX 5) Head, tapped

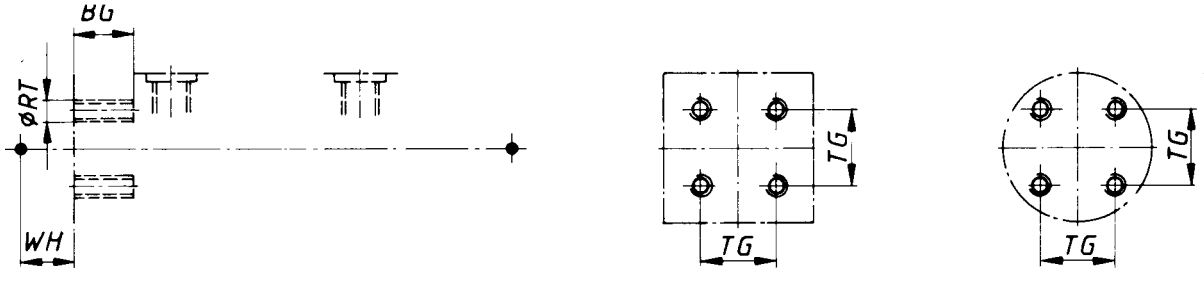



Figure 53 — (MDX 5) Head, tapped — Double rod

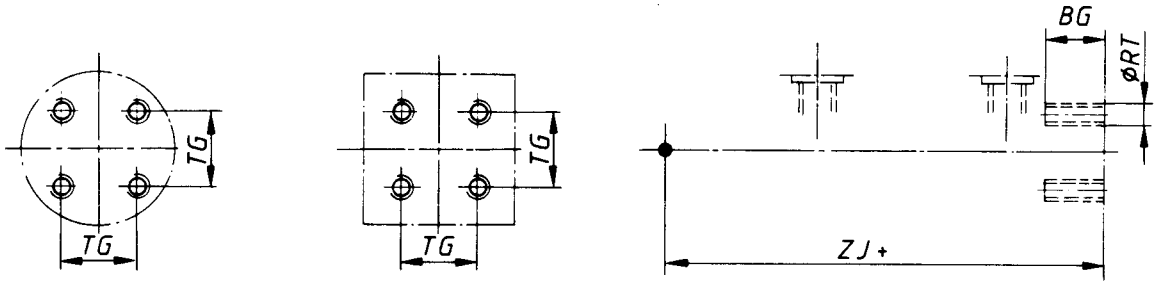



**Figure 54 — (MX 6) Cap, tapped**

## 8 Listing for letter codes

| Symbol | Designation |
|---|---|
| *A* | Thread length of externally threaded rod end (rod end dimensions) |
| *B* | Diameter of head end pilot (general dimensions — ME 5 — MDE 5 — ME 7 — MDE 7 — ME 9 — MDE 9) |
| *C* | |
| *D* | Ends outer diameter (general dimensions) |
| *E* | End view dimension (general dimensions — ME 5 — MDE 5 — ME 6 — MF 1 — MDF 1 — MF 2) |
| *F* | Thickness of retainer plate (general dimensions — ME 5 — MDE 5 — ME 7 — MDE 7 — ME 9 — MDE 9) |
| *G* | Head thickness (ME 5 — MDE 5 — ME 7 — MDE 7 — ME 9 — MDE 9) |
| *H* | |
| *J* | Cap thickness (ME 6 — ME 8 — ME 10) |
| *K* | |
| *L* | Clearance around pivot axis (MP 1 — MP 2 — MP 3 — MP 4 — MP 7) |
| *M* | |
| *N* | |
| *O* | |
| *P* | |
| *R* | Distance between mounting holes (accessories — ME 5 — MDE 5 — ME 6 — MF 1 — MDF 1 — MF 2 — MF 5 — MDF 5 — MF 6) |
| *S* | |
| *T* | Clearance hole through the mounting face (accessories) |
| *U* | |
| *V* | |
| *W* | Distance between TRP* and mounting face (MF 1 — MDF 1) |
| *X* | |
| *Y* | Distance between TRP and head port (general dimensions) |
| *Z* | Tilting angle (accessories — MP 5 — MP 6) |

* TRP is defined in clause 4.

**Listing for letter codes** (*continued*)

| Symbol 2nd letter *A* | Designation |
|---|---|
| *AA* | |
| *BA* | Diameter of cap pilot (general dimensions) |
| *CA* | Distance betwen TRP and pivot axis (accessories) |
| *DA* | |
| *EA* | |
| *FA* | |
| *GA* | |
| *HA* | |
| *JA* | |
| *KA* | Nut height, recessed (general dimensions) |
| *LA* | |
| *MA* | |
| *NA* | |
| *OA* | |
| *PA* | |
| *RA* | |
| *SA* | Longitudinal distance between mounting holes (MS 1) |
| *TA* | Distance between mounting holes (accessories) |
| *UA* | |
| *VA* | Cap pilot extension (general dimensions) |
| *WA* | |
| *XA* | Distance between TRP and rear mounting holes (MS 1) |
| *YA* | |
| *ZA* | |

**Listing for letter codes** (*continued*)

| Symbol 2nd letter *B* | Designation |
|---|---|
| *AB* | Mounting holes diameter (MS 1 — MDS 1) |
| *BB* | Length of stud on tie rod extension (MX 1 — MDX 1 — MX 2 — MDX 2 — MX 3 — MX 4 — MDX 4) |
| *CB* | Clevis slot width (MP 1 — MP 2 — MP 7) |
| *DB* | |
| *EB* | |
| *FB* | Mounting holes diameter (ME 5 — MDE 5 — ME 6 — ME 7 — MDE 7 — ME 8 — ME 9 — MDE 9 — ME 10 — MF 1 — MDF 1 — MF 2 — MF 3 — MDF 3 — MF 4 — MF 5 — MDF 5 — MF 6 — MF 7 — MDF 7) |
| *GB* | |
| *HB* | Mounting holes diameter (accessories) |
| *JB* | |
| *KB* | Nut height, exposed (general dimensions) |
| *LB* | |
| *MB* | |
| *NB* | |
| *OB* | |
| *PB* | |
| *RB* | |
| *SB* | Mounting holes diameter (MS 2 — MDS 2) |
| *TB* | Distance between mounting holes (accessories) |
| *UB* | Envelope distance (MP 1 — MP 2 — MP 7) |
| *VB* | |
| *WB* | Distance between TRP and mounting face (MF 7 — MDF 7) |
| *XB* | |
| *YB* | |
| *ZB* | Distance between TRP and cap end extremity (general dimensions) |

**Listing for letter codes** (*continued*)

| Symbol 2nd letter *C* | Designation |
|---|---|
| *AC* | |
| *BC* | |
| *CC* | |
| *DC* | |
| *EC* | |
| *FC* | Pitch circle diameter of holes (MF 3 – MDF 3 – MF 4 – MF 7 –MDF 7) |
| *GC* | |
| *HC* | |
| *JC* | |
| *KC* | |
| *LC* | |
| *MC* | |
| *NC* | |
| *OC* | |
| *PC* | |
| *RC* | Distance between mounting holes (accessories) |
| *SC* | |
| *TC* | Distance between trunnion bases (MT 1 – MDT 1 – MT 2 – MT 5 – MT 6) |
| *UC* | Envelope diameter (MF 3 – MDF 3 – MF 4 – MF 7 – MDF 7) |
| *VC* | Extension of pilot on flange (MF 7 – MDF 7) |
| *WC* | Distance between TRP and mounting face (MF 3 – MDF 3) |
| *XC* | Distance between TRP and pivot axis (MP 1 – MP 3) |
| *YC* | |
| *ZC* | |

**Listing for letter codes** (*continued*)

| **Symbol** 2nd letter *D* | **Designation** |
|---|---|
| *AD* | |
| *BD* | |
| *CD* | Diameter of pivot hole (MP 1 – MP 2 – MP 3 – MP 4 – MP 7) |
| *DD* | Thread size (MX 1 – MDX 1 – MX 2 – MDX 2 – MX 3 – MX 4 – MDX 4) |
| *ED* | |
| *FD* | Pitch circle diameter of holes (ME 7 – MDE 7 – ME 8) |
| *GD* | |
| *HD* | |
| *JD* | |
| *KD* | |
| *LD* | |
| *MD* | |
| *ND* | |
| *OD* | |
| *PD* | |
| *RD* | Diameter of retainer plate (ME 5 – MDE 5 – ME 7 – MDE 7 – ME 9 – MDE 9) |
| *SD* | |
| *TD* | Diameter of trunnion pins (MT 1 – MDT 1 – MT 2 – MT 4 – MDT 4 – MT 5 – MT 6) |
| *UD* | Envelope length (accessories) |
| *VD* | Pilot extention past retainer plate (general dimensions – ME 5 – MDE 5 – ME 7 – MDE 7 – ME 9 – MDE 9) |
| *WD* | |
| *XD* | Distance between TRP and pivot axis (MP 2 – MP 4) |
| *YD* | |
| *ZD* | |

**Listing for letter codes** (*continued*)

| **Symbol** 2nd letter *E* | **Designation** |
|---|---|
| *AE* | |
| *BE* | Mounting thread size (MR 3 — MDR 3 — MR 4) |
| *CE* | Distance between TRP and pivot axis (accessories) |
| *DE* | |
| *EE* | Port size (tapped, general dimensions) |
| *FE* | |
| *GE* | |
| *HE* | |
| *JE* | |
| *KE* | |
| *LE* | Clearance around pivot axis (accessories) |
| *ME* | Thickness of flange (MF 5 — MDF 5 — MF 6) |
| *NE* | |
| *OE* | |
| *PE* | |
| *RE* | Distance between mounting holes (accessories) |
| *SE* | |
| *TE* | |
| *UE* | Envelope diameter (ME 7 — MDE 7 — ME 8) |
| *VE* | Head end pilot extension past head (general dimensions, $VE = VD + F$) |
| *WE* | Distance between TRP and mounting face (MF 5 — MDF 5) |
| *XE* | |
| *YE* | |
| *ZE* | |

**Listing for letter codes** (*continued*)

| Symbol 2nd letter *F* | Designation |
|---|---|
| *AF* | Thread length of tapped rod end (rod end dimensions) |
| *BF* | Length of mounting screw (MR 3 — MDR 3 — MR 4) |
| *CF* | Diameter of pivot holes (accessories) |
| *DF* | |
| *EF* | Clearance radius of pivot axis (accessories) |
| *FF* | Flange port size (general dimensions) |
| *GF* | |
| *HF* | |
| *JF* | |
| *KF* | Thread size in tapped rod end (rod end dimensions) |
| *LF* | Clearance around pivot axis (accessories) |
| *MF* | Thickness of flange (MF 1 — MDF 1 — MF 2) |
| *NF* | Thickness of flange (MF 3 — MDF 3 — MF 4 — MF 7 — MDF 7) |
| *OF* | |
| *PF* | |
| *RF* | |
| *SF* | |
| *TF* | Distance between mounting holes (MF 1 — MDF 1 — MF 2 — MF 5 — MDF 5 — MF 6) |
| *UF* | Envelope length (MF 1 — MDF 1 — MF 2 — MF 5 — MDF 5 — MF 6) |
| *VF* | |
| *WF* | Distance between TRP and head or mounting face (general dimensions — ME 5 — MDE 5 — ME 7 — MDE 7 — ME 9 — MDE 9 — MR 3 — MDR 3) |
| *XF* | |
| *YF* | |
| *ZF* | Distance between TRP and back face of rear flange (MF 2) |

**Listing for letter codes** (*continued*)

| **Symbol** 2nd letter *G* | **Designation** |
|---|---|
| *AG* | |
| *BG* | Depth of tapped mounting holes (MX 5 — MDX 5 — MX 6) |
| *CG* | Clevis bracket for spherical plain bearing slot (accessories) |
| *DG* | |
| *EG* | |
| *FG* | |
| *GG* | |
| *HG* | |
| *JG* | |
| *KG* | |
| *LG* | Clearance around pivot axis (accessories) |
| *MG* | |
| *NG* | |
| *OG* | |
| *PG* | |
| *RG* | |
| *SG* | |
| *TG* | 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) |
| *UG* | Envelope length (ME 9 — MDE 9 — ME 10) |
| *VG* | |
| *WG* | |
| *XG* | Distance between TRP and trunnion axis (MT 1 — MDT 1) |
| *YG* | |
| *ZG* | Distance between mounting face and opposite rod shoulder (MDE 5 — MDE 7 — MDE 9 — MDR 3) |

**Listing for letter codes** (*continued*)

| Symbol 2nd letter *H* | Designation |
|---|---|
| *AH* | Centreline height (MS 1 — MDS 1) |
| *BH* | |
| *CH* | Distance between TRP and pivot axis (accessories) |
| *DH* | |
| *EH* | |
| *FH* | |
| *GH* | |
| *HH* | |
| *JH* | |
| *KH* | |
| *LH* | Centreline height (MS 2 — MDS 2) |
| *MH* | |
| *NH* | |
| *OH* | |
| *PH* | |
| *RH* | |
| *SH* | |
| *TH* | |
| *UH* | Envelope length (accessories) |
| *VH* | |
| *WH* | Distance between TRP and mounting face (general dimensions — MX 1 — MDX 1 — MX 3 — MX 4 — MDX 4 — MX 5 — MDX 5) |
| *XH* | Distance between TRP and trunnion axis (MT 5) |
| *YH* | |
| *ZH* | Distance between TRP and back face of rear flange (MF 6) |

**Listing for letter codes** (*continued*)

| **Symbol** 2nd letter *J* | **Designation** |
|---|---|
| *AJ* | |
| *BJ* | |
| *CJ* | Diameter of pivot hole (rod end dimensions) |
| *DJ* | |
| *EJ* | |
| *FJ* | |
| *GJ* | |
| *HJ* | |
| *JJ* | |
| *KJ* | |
| *LJ* | |
| *MJ* | |
| *NJ* | |
| *OJ* | |
| *PJ* | Distance between ports (general dimensions) |
| *RJ* | |
| *SJ* | |
| *TJ* | |
| *UJ* | Envelope length (accessories) |
| *VJ* | |
| *WJ* | |
| *XJ* | Distance between TRP and trunnion axis (MT 2) |
| *YJ* | |
| *ZJ* | Distance between TRP and cap end (general dimensions — ME 6 — ME 8 — ME 10 — MR 4 — MX 1 — MX 2 — MX 4 — MX 6) |

**Listing for letter codes** (*continued*)

| Symbol 2nd letter *K* | Designation |
|---|---|
| *AK* | |
| *BK* | |
| *CK* | Diameter of pivot holes (accessories) |
| *DK* | |
| *EK* | Diameter of pin (accessories) |
| *FK* | |
| *GK* | |
| *HK* | |
| *JK* | Diameter of pin (accessories) |
| *KK* | Internal or external thread size (rod end dimensions – accessories) |
| *LK* | |
| *MK* | |
| *NK* | |
| *OK* | |
| *PK* | Distance between ports (general dimensions) |
| *RK* | |
| *SK* | |
| *TK* | |
| *UK* | Envelope length (accessories) |
| *VK* | |
| *WK* | |
| *XK* | |
| *YK* | |
| *ZK* | Distance between TRP and opposite head face (general dimensions) |

**Listing for letter code** (*continued*)

| **Symbol** 2nd letter *L* | **Designation** |
|---|---|
| *AL* | Cylinder bore (general dimensions) |
| *BL* | |
| *CL* | Envelope and mounting clevis lengths (envelope dimension — accessories) |
| *DL* | Spherical eye bracket mounting face to pivot axis (MP 6) |
| *EL* | Mounting length of pin (accessories) |
| *FL* | Mounting face to pivot axis (accessories — MP 2 — MP 4 — MP 7) |
| *GL* | |
| *HL* | |
| *JL* | |
| *KL* | |
| *LL* | |
| *ML* | |
| *NL* | |
| *OL* | |
| *PL* | Distance between cap port and cap end (general dimensions) |
| *RL* | |
| *SL* | |
| *TL* | Length of trunnion pins (MT 1 — MDT 1 — MT 2 — MT 4 — MDT 4 — MT 5 — MT 6) |
| *UL* | |
| *VL* | |
| *WL* | |
| *XL* | Distance between TRP and trunnion axis (MT 6) |
| *YL* | |
| *ZL* | Distance between TRP and opposite head end extremity except rod (general dimensions) |

**Listing for letter codes** (*continued*)

| Symbol 2nd letter *M* | Designation |
|---|---|
| *AM* | |
| *BM* | |
| *CM* | Rod clevis slot width, clevis bracket slot width (accessories) |
| *DM* | |
| *EM* | Eye bracket eye width, rod eye, plain eye width (accessories) |
| *FM* | Mounting face to pivot axis (accessories) |
| *GM* | |
| *HM* | |
| *JM* | |
| *KM* | |
| *LM* | |
| *MM* | Rod diameter (*d*) (general dimensions) |
| *NM* | |
| *OM* | |
| *PM* | Distance between far port and far end (general dimensions) |
| *RM* | |
| *SM* | Longitudinal distance between mounting holes (MDS 1) |
| *TM* | Distance between trunnion bases (MT 4 — MDT 4) |
| *UM* | Envelope distance (MT 4 — MDT 4) |
| *VM* | |
| *WM* | |
| *XM* | Distance between TRP and opposite holes (MDS 1) |
| *YM* | |
| *ZM* | Distance between TRP and opposite rod shoulder (general dimensions) |

**Listing for letter codes** (*continued*)

| Symbol 2nd letter *N* | Designation |
|---|---|
| *AN* | |
| *BN* | |
| *CN* | Diameter of pin pivot axis (accessories) |
| *DN* | |
| *EN* | Spherical bearing width (accessories) |
| *FN* | |
| *GN* | |
| *HN* | |
| *JN* | |
| *KN* | |
| *LN* | |
| *MN* | |
| *NN* | |
| *ON* | |
| *PN* | |
| *RN* | |
| *SN* | |
| *TN* | |
| *UN* | Envelope diameter (MT 5 — MT 6) |
| *VN* | |
| *WN* | |
| *XN* | Distance between TRP and pivot axis (MP 6) |
| *YN* | |
| *ZN* | Distance between mounting face and opposite rod shoulder (MDF 3) |

**Listing for letter codes** (*continued*)

| Symbol 2nd letter *O* | Designation |
|---|---|
| *AO* | Distance between mounting holes and the outer end of angles (MS 1 — MDS 1) |
| *BO* | |
| *CO* | |
| *DO* | |
| *EO* | |
| *FO* | |
| *GO* | |
| *HO* | |
| *JO* | |
| *KO* | |
| *LO* | |
| *MO* | |
| *NO* | |
| *OO* | |
| *PO* | |
| *RO* | |
| *SO* | |
| *TO* | Distance between mounting holes (ME 5 — MDE 5 — ME 6) |
| *UO* | Envelope length (ME 5 — MDE 5 — ME 6) |
| *VO* | |
| *WO* | |
| *XO* | Distance between TRP and pivot axis (MP 5) |
| *YO* | |
| *ZO* | Distance between TRP and mounting face (MDX 1 — MDX 2 — MDX 4) |