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

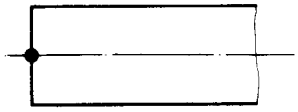
For definitions of terms used, see ISO 5598.

1) At present at the state of draft.

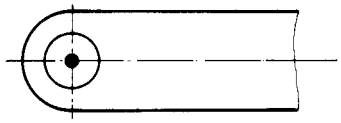
4 Reference point

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).

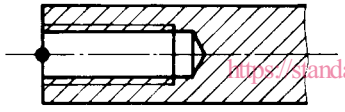
4.1 For a plain rod end, the reference point is located on the rod centreline at the end of the piston rod :



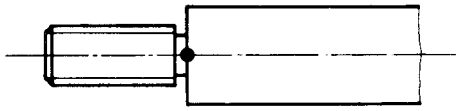
4.2 For a pin rod end, the reference point is located at the intersection of the pin centreline and of the piston rod centre line :



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

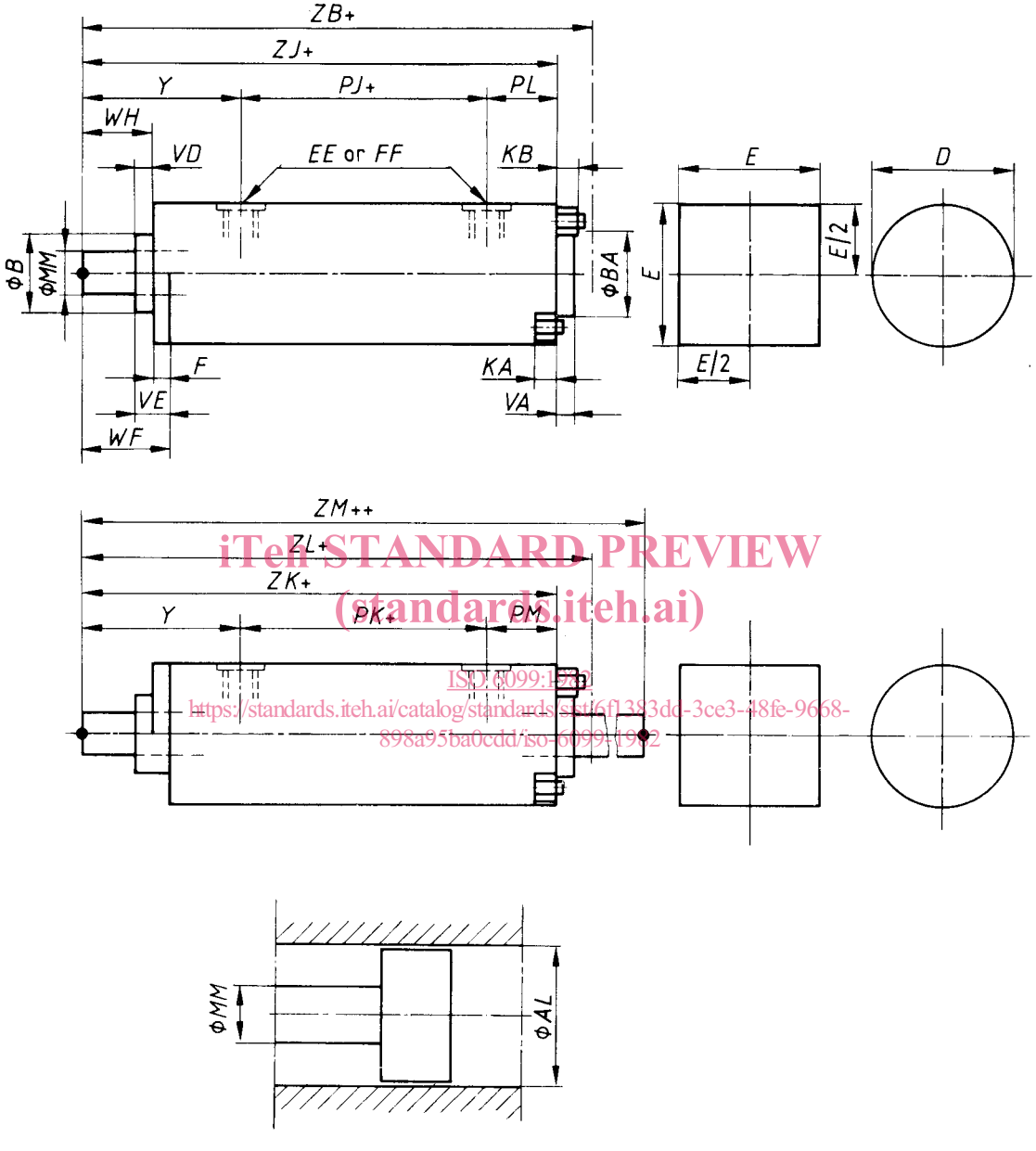


Figure 1 — General dimensions arrangement by cylinders

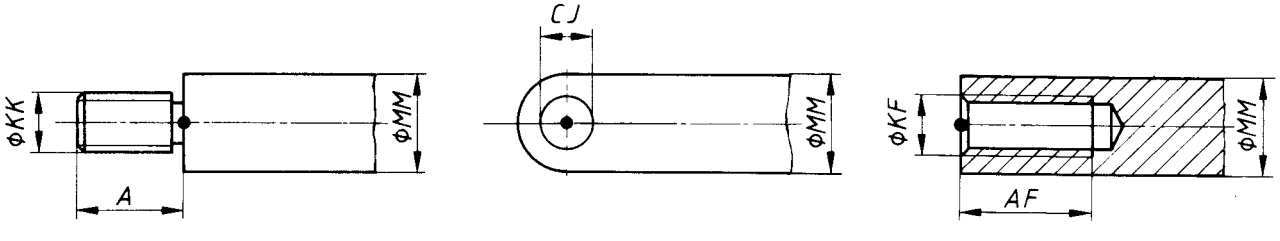
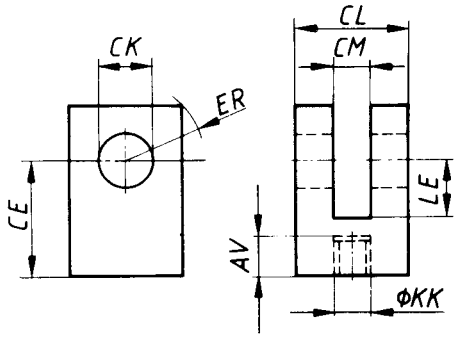
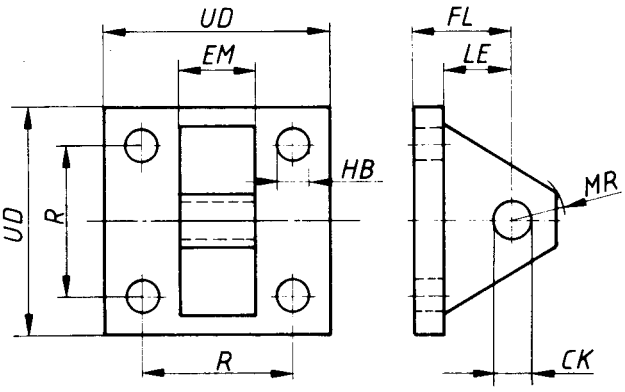


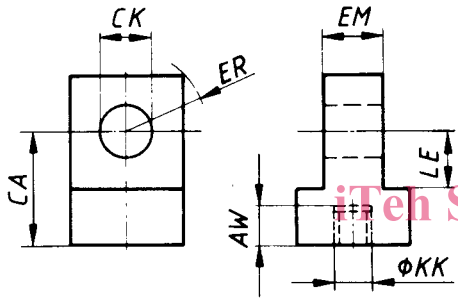
Figure 2 — Rod end dimensions



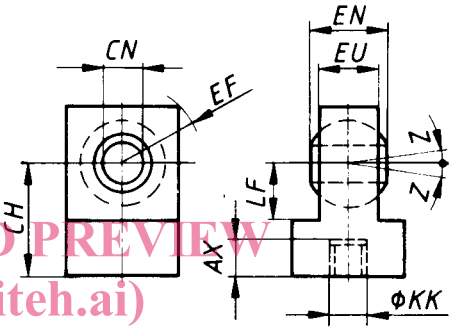
a) Rod clevis



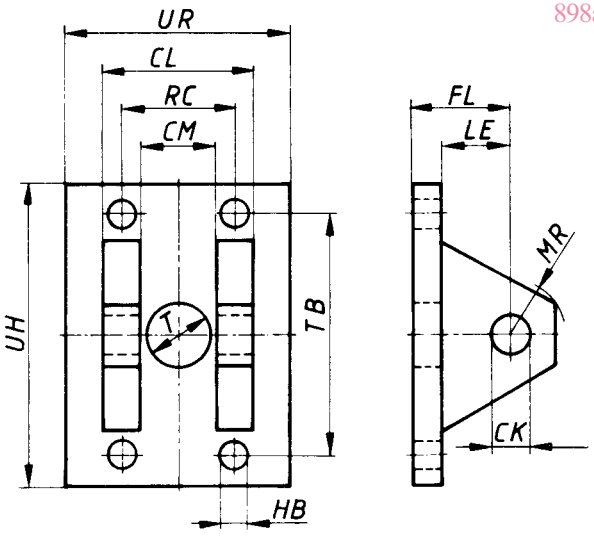
b) Eye bracket



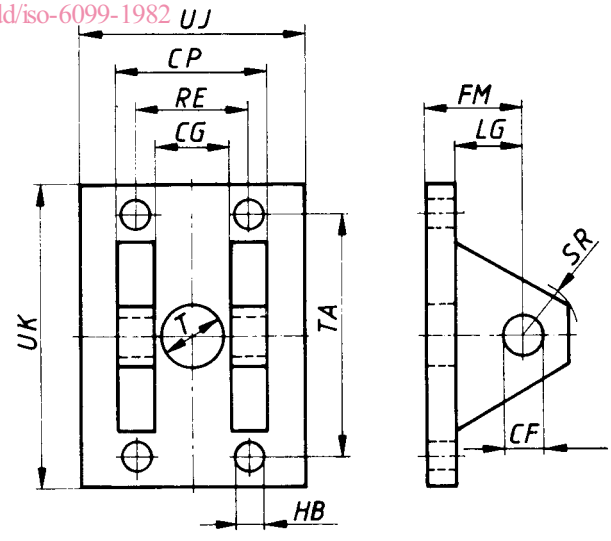
c) Rod eye plain



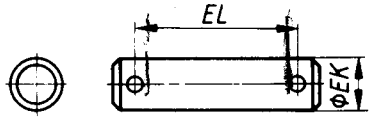
d) Rod eye with spherical plain bearing



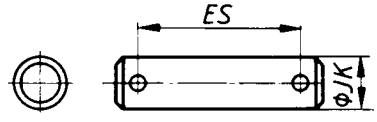
e) Clevis bracket



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)

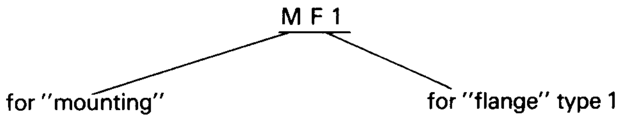
Figure 3 — Cylinder accessories

6 Identification code for mounting types

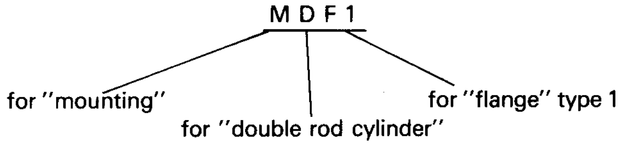
6.1 General

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

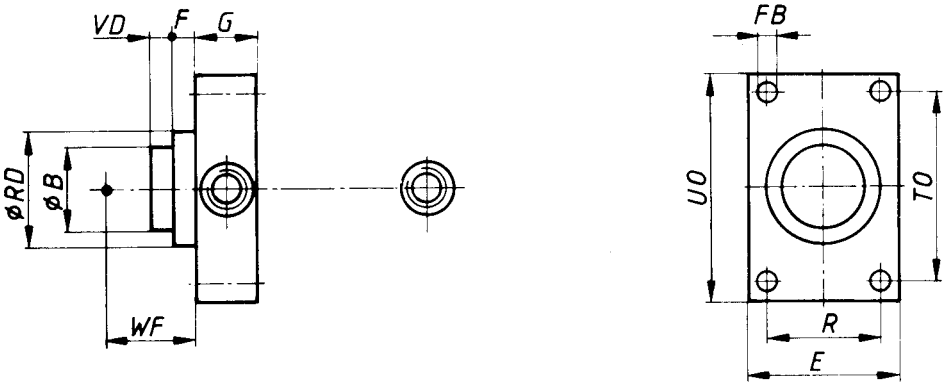


Figure 4 — (ME 5) Head, rectangular

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

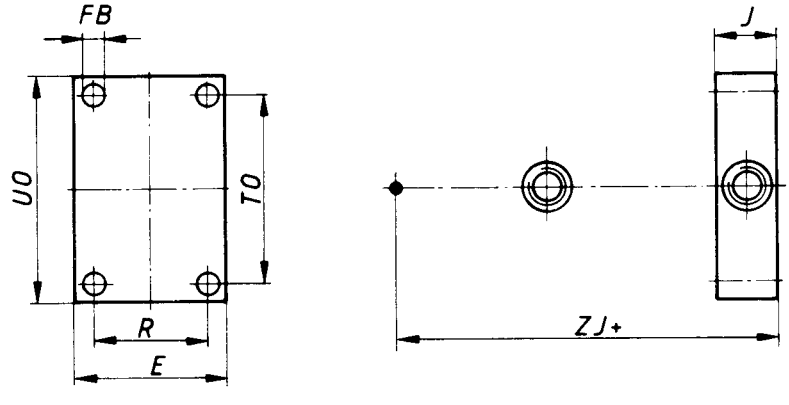


Figure 6 — (ME 6) Cap, rectangular

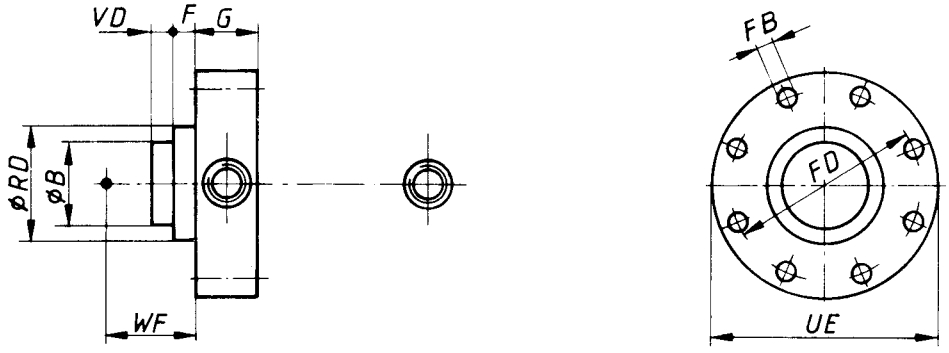


Figure 7 — (ME 7) Head, round

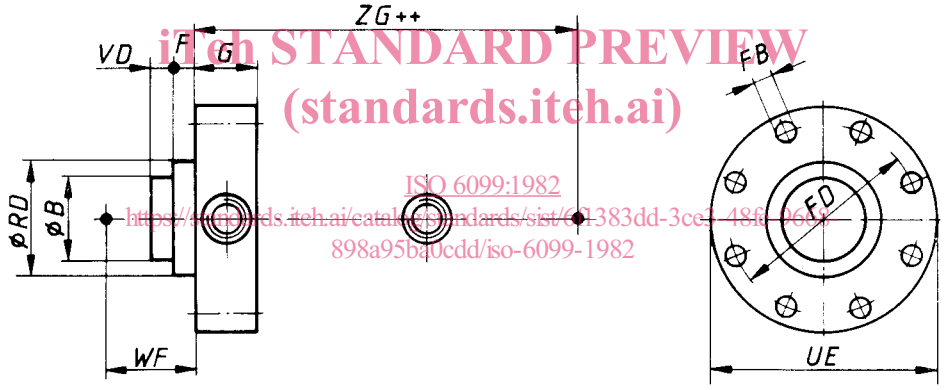


Figure 8 — (MDE 7) Head, round — Double rod

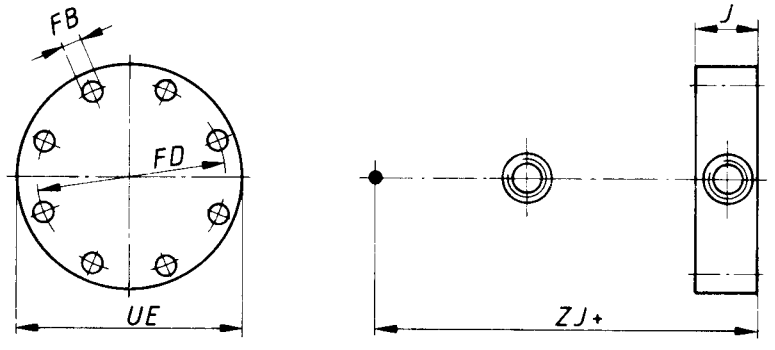


Figure 9 — (ME 8) Cap, round

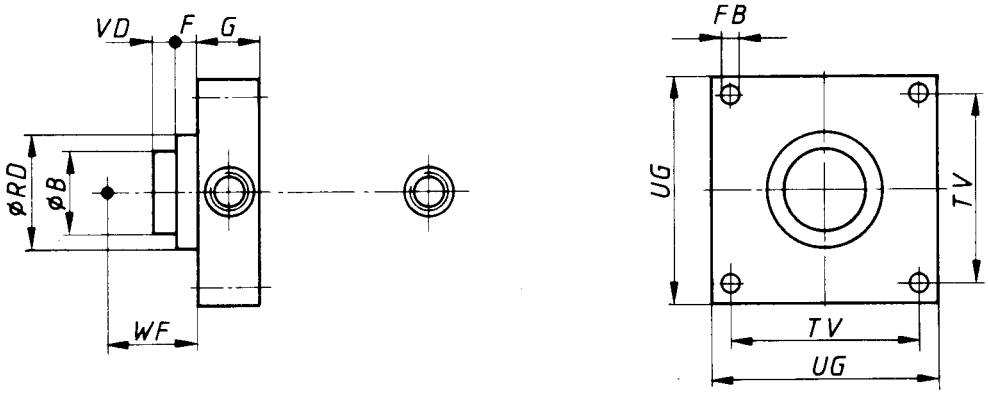


Figure 10 — (ME 9) Head, square

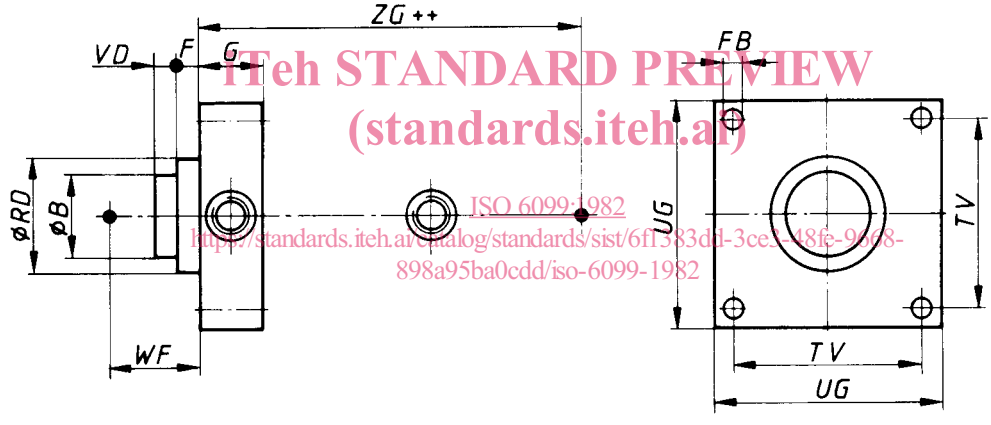


Figure 11 — (MDE 9) Head, square — Double rod

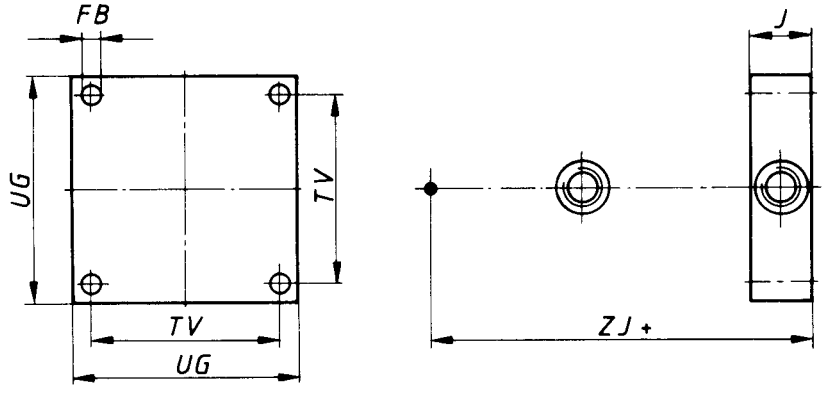


Figure 12 — (ME 10) Cap, square

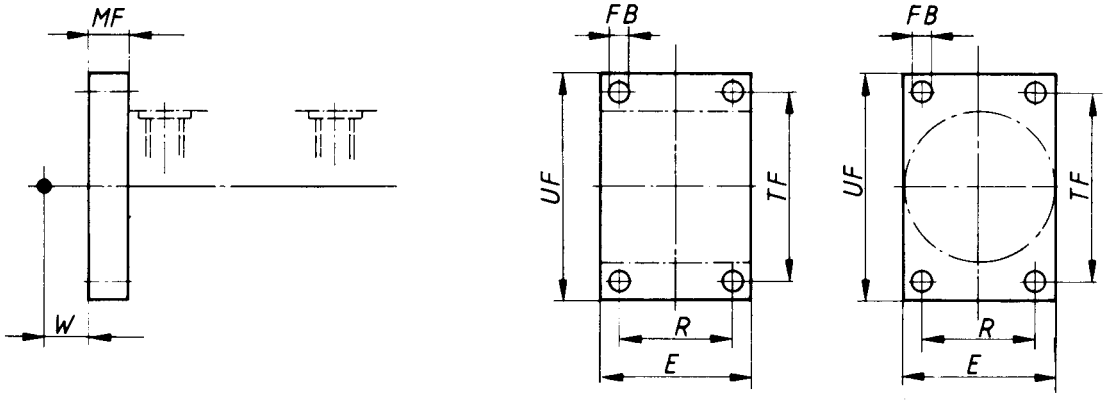


Figure 13 — (MF 1) Head, rectangular flange

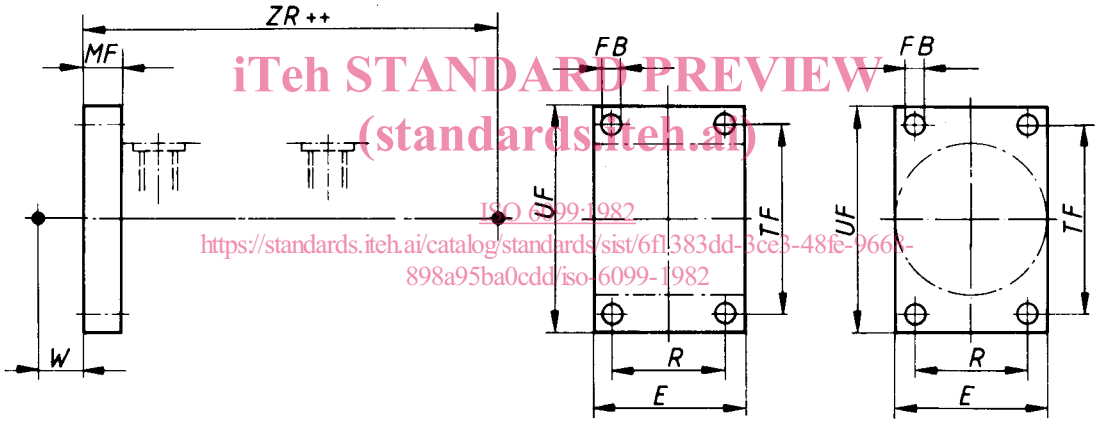


Figure 14 — (MDF 1) Head, rectangular flange — Double rod

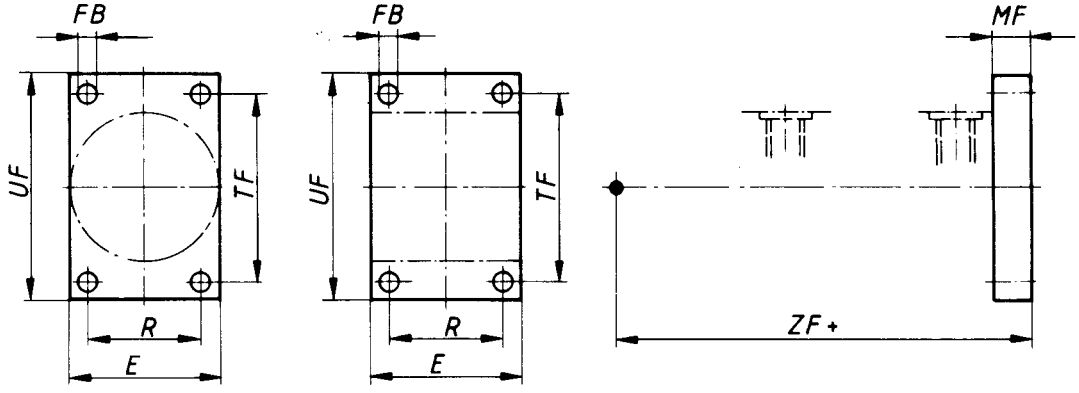


Figure 15 — (MF 2) Cap, rectangular flange

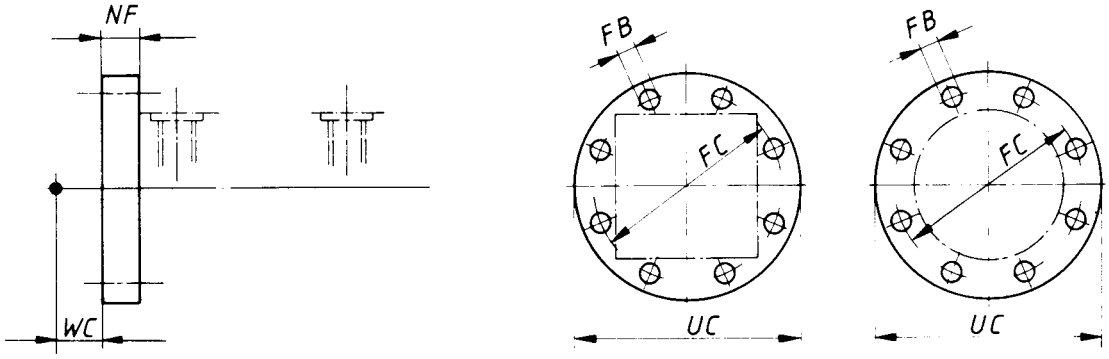


Figure 16 — (MF 3) Head, circular flange

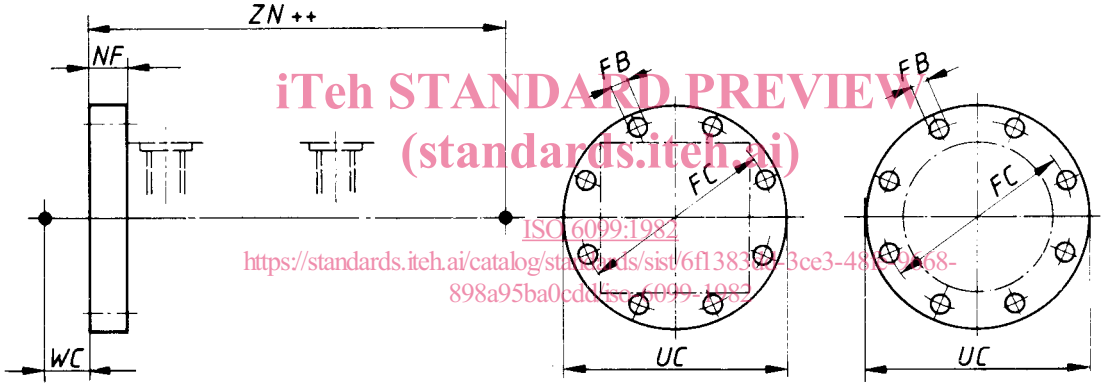


Figure 17 — (MDF 3) Head, circular flange — Double rod

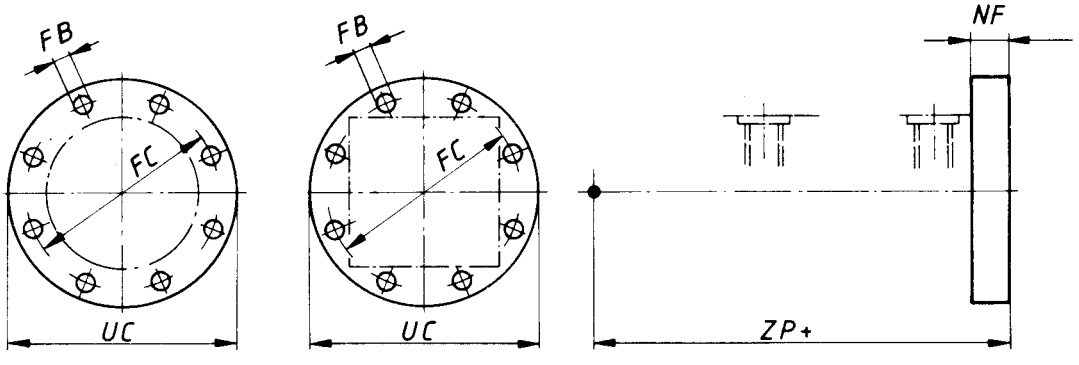


Figure 18 — (MF 4) Cap, circular flange

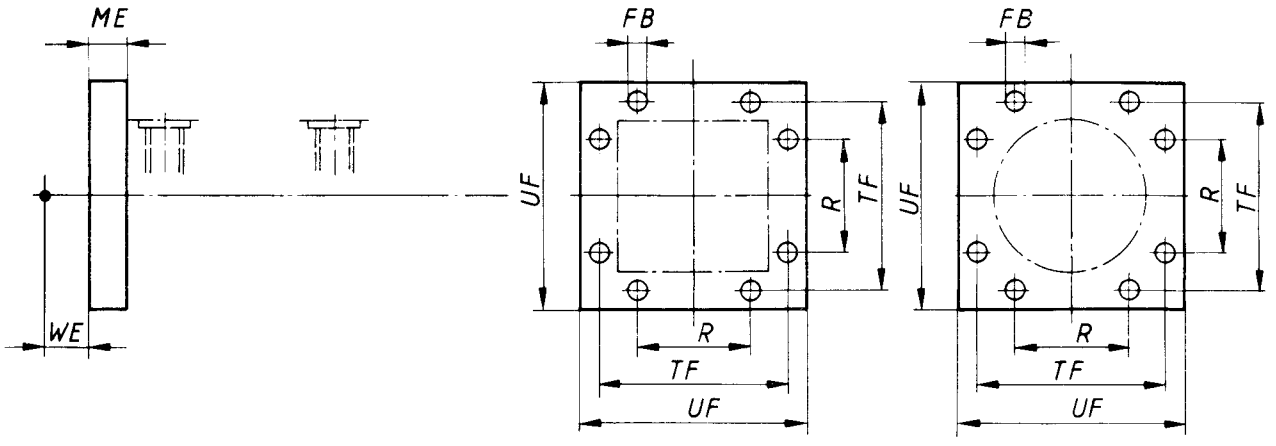


Figure 19 — (MF 5) Head, square flange

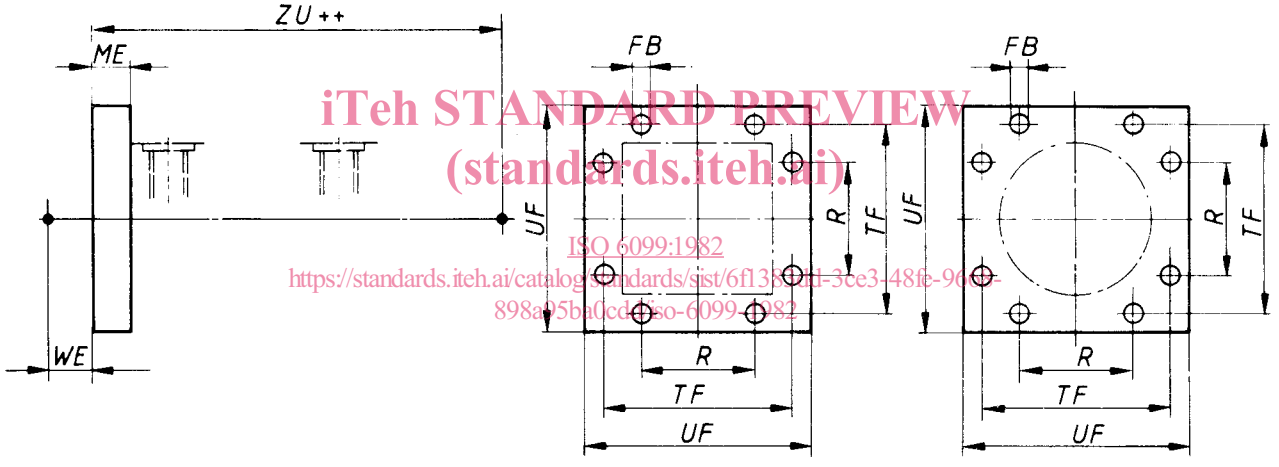


Figure 20 — (MDF 5) Head, square flange — Double rod

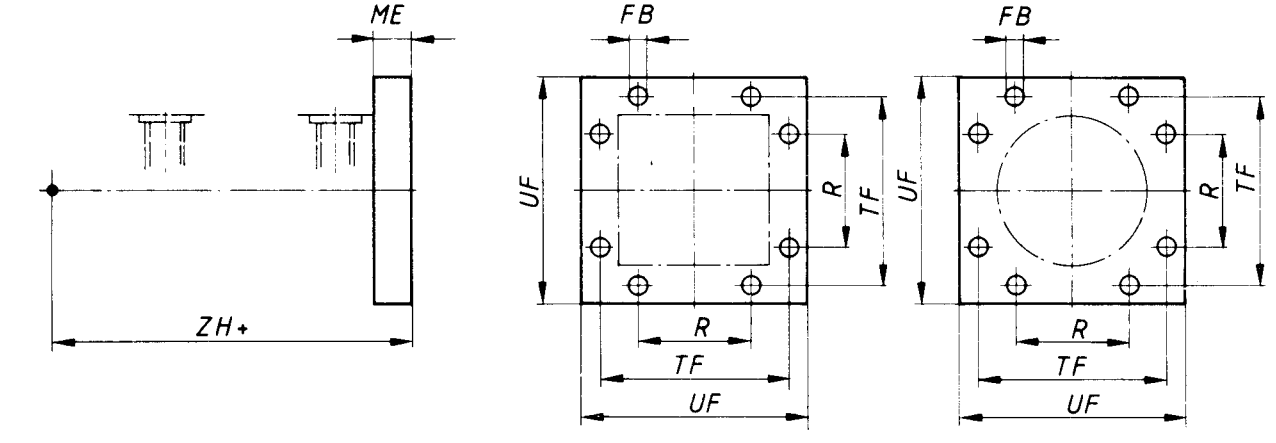


Figure 21 — (MF 6) Cap, square flange