
**Hydraulic fluid power — Mounting
dimensions for single rod cylinders,
16 MPa (160 bar) series —**

**Part 3:
Compact series with bores from 250
mm to 500 mm**

*Transmissions hydrauliques — Dimensions d'interchangeabilité des
vérins 16 MPa (160 bar) à simple tige —*

Partie 3: Série compacte, alésages de 250 mm à 500 mm



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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

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Foreword

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

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 131, *Fluid power systems*, Subcommittee SC 3, *Cylinders*.

This second edition cancels and replaces the first edition (ISO 6020-3:1994), which has been technically revised.

ISO 6020 consists of the following parts, under the general title *Hydraulic fluid power — Mounting dimensions for single rod cylinders, 16 MPa (160 bar) series*:

- *Part 1: Medium series*
- *Part 2: Compact series*
- *Part 3: Compact series with bores from 250 mm to 500 mm*

Introduction

In hydraulic fluid power systems, power is transmitted and controlled through a liquid under pressure within an enclosed circuit.

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

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Hydraulic fluid power — Mounting dimensions for single rod cylinders, 16 MPa (160 bar) series —

Part 3: Compact series with bores from 250 mm to 500 mm

1 Scope

This part of ISO 6020 establishes metric mounting dimensions for single rod compact series hydraulic cylinders with bores from 250 mm to 500 mm for use at 16 MPa (160 bar¹⁾), as required for interchangeability of commonly used hydraulic cylinders.

NOTE 1 This part of ISO 6020 allows manufacturers of hydraulic equipment flexibility in the design of metric cylinders and does not restrict technical development, but does provide basic guidelines.

NOTE 2 The compact series dimensions are most applicable to square-head cylinders.

This part of ISO 6020 applies only to the dimensions of manufactured products. It does not apply to their functional characteristics.

2 Normative references

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

ISO 273, *Fasteners — Clearance holes for bolts and screws*

ISO 3320, *Fluid power systems and components — Cylinder bores and piston rod diameters and area ratios — Metric series*

ISO 4395, *Fluid power systems and components — Cylinder piston rod end types and dimensions*

ISO 5598, *Fluid power systems and components — Vocabulary*

ISO 6099, *Fluid power systems and components — Cylinders — Identification code for mounting dimensions and mounting types*

ISO 6162-1, *Hydraulic fluid power — Flange connectors with split or one-piece flange clamps and metric or inch screws — Part 1: Flange connectors, ports and mounting surfaces for use at pressures of 3,5 MPa (35 bar) to 35 MPa (350 bar), DN 13 to DN 127*

3 Terms and definitions

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

4 Dimensions

4.1 Mounting dimensions for cylinders manufactured in accordance with this part of ISO 6020 shall be selected from [Tables 1 to 9](#). [Figures 1 to 9](#) show the mounting styles and relevant dimensions.

1) 1 bar = 0,1 MPa = 10⁵ Pa; 1 MPa = 1 N/mm².

4.2 Tolerances for mounting dimensions shall be in accordance with [Table 10](#).

5 Bore sizes

The following bore sizes, in millimetres, are included in this compact series:

250 — 320 — 360²⁾ — 400 — 500

6 Piston stroke tolerances

The tolerance on piston strokes shall be as follows:

- piston strokes $\leq 1\,250$ mm: $+2/-0$ mm;
- piston strokes $> 1\,250$ mm and $\leq 3\,150$ mm: $+5/-0$ mm;
- piston strokes $> 3\,150$ mm and $\leq 8\,000$ mm: $+8/-0$ mm.

7 Mounting styles

This part of ISO 6020 includes the following mounting styles, in accordance with ISO 6099:

- ME 11 — Head, square flange (see [Figure 2](#) and [Table 2](#));
- ME 12 — Cap, square flange (see [Figure 3](#) and [Table 3](#));
- MP 1 — Cap, fixed clevis (see [Figure 4](#) and [Table 4](#));
- MP 3 — Cap, fixed eye (see [Figure 5](#) and [Table 5](#));
- MP 5 — Cap, fixed eye with spherical plain bearing (see [Figure 6](#) and [Table 6](#));
- MT 1 — Head, integral trunnion (male) (see [Figure 7](#) and [Table 7](#));
- MT 2 — Cap, integral trunnion (male) (see [Figure 8](#) and [Table 8](#));
- MT 4 — Intermediate trunnion (male) with selectable position (see [Figure 9](#) and [Table 9](#)).

8 Piston rod characteristics

8.1 This part of ISO 6020 covers piston rods that have a shouldered male thread end (see [Figure 1](#) and [Table 1](#) for basic dimensions).

8.2 For rod end types, see ISO 4395.

9 Identification statement (reference to this part of ISO 6020)

It is strongly recommended for fabricators who elect to conform to this part of ISO 6020 to use the following statement in test reports, catalogues, and sales literature:

“Interchangeable hydraulic cylinder mounting dimensions selected in accordance with ISO 6020-3:2015, Hydraulic fluid power — Mounting dimensions for single rod cylinders, 16 MPa (160 bar) series — Part 3: Compact series with bores from 250 mm to 500 mm”.

2) Non-preferred size.

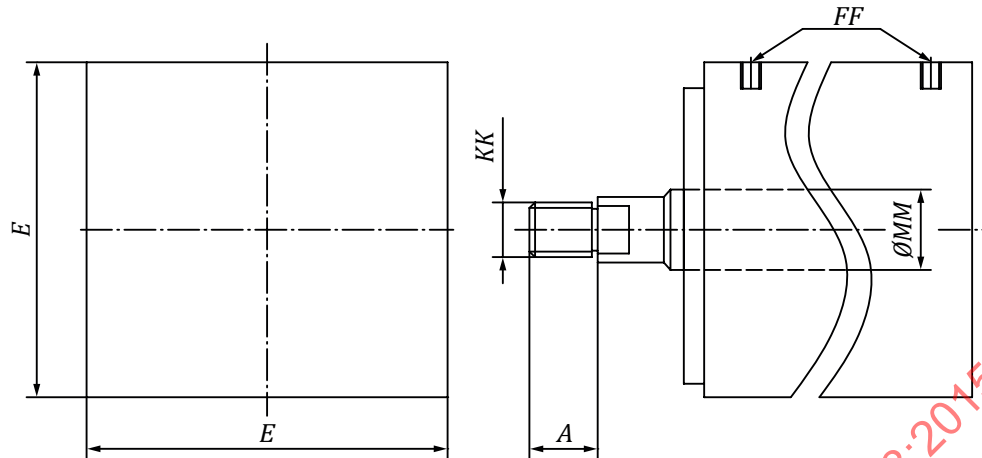


Figure 1 — General dimensions

Table 1 — General dimensions and part sizes

Dimensions in millimetres

Bore	Rod ^a MM	KK 6g	A max.	E max.	FF ^b
250	140	M100 × 3	112	320	DN 51
	180	M125 × 4	125		
320	180	M125 × 4	125	400	DN 64
	220	M160 × 4	160		
360 ^c	180	M125 × 4	125	450	DN 64
	250	M180 × 4	180		
400	220	M160 × 4	160	500	DN 64
	280	M200 × 4	200		
500	280	M200 × 4	200	630	DN 64
	360	M250 × 6	250		

^a Other piston rod sizes that appear in ISO 3320 may be used.

^b See ISO 6162-1 for flange port dimensions.

^c 360 mm bore is a non-preferred size.

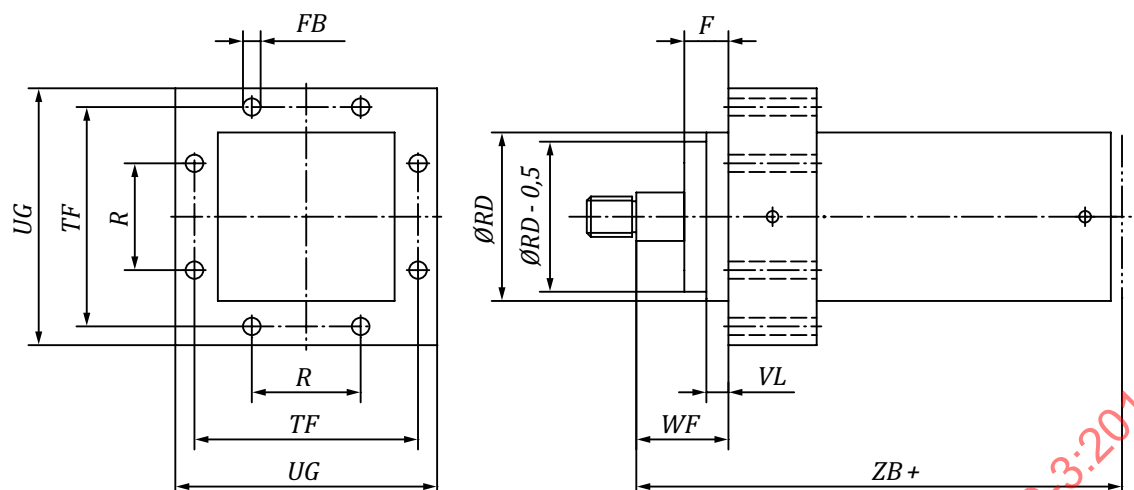


Figure 2 — ME 11 — Head mounting, square flange

Table 2 — Dimensions of head mountings, square flange

Dimensions in millimetres

Bore	Rod ^a MM	RD	TF	FB ^d	R	WF	F	VL	UG	ZB ^b
		f8	js13	H13	js13	+2	max.	min.	max.	
250	140	280	380	30	235	110	75	5	445	460
	180									
320	180	325	472	36	283	110	75	5	549	520
	220									
360 ^c	180	350	528	39	305	110	75	5	611	575
	250									
400	220	380	588	45	340	110	75	5	683	625
	280									
500	280	490	740	56	425	110	75	5	858	775
	360									

^a Other piston rod sizes that appear in ISO 3320 may be used.^b Tolerance on dimension, ZB, is dependent on stroke (see [Table 10](#)).^c 360 mm bore is a non-preferred size.^d Hole in accordance with ISO 273, medium.

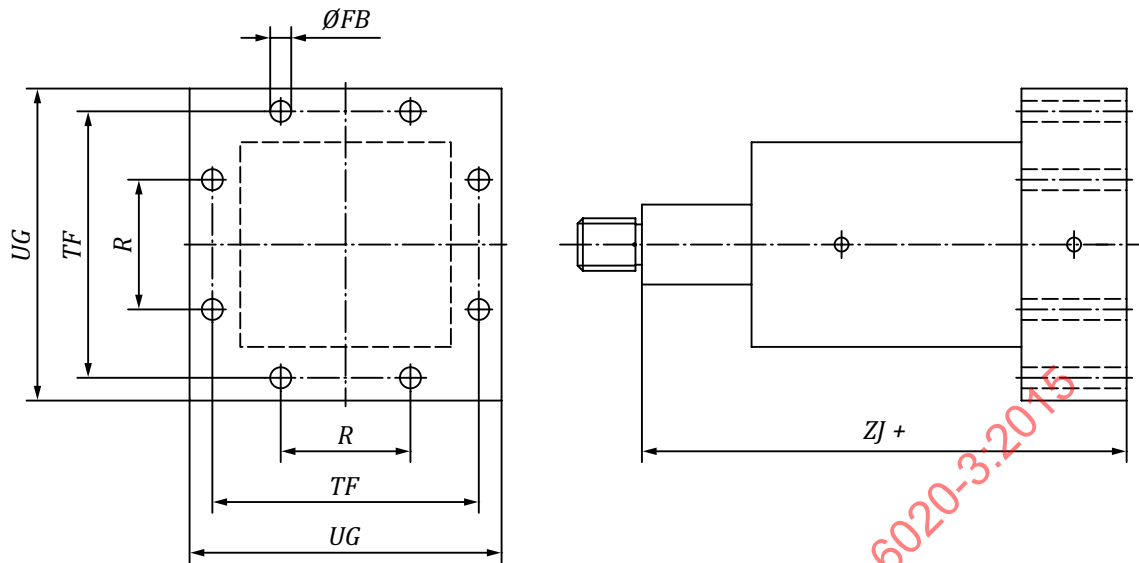


Figure 3 — ME 12 — Cap mounting, square flange

Table 3 — Dimensions of cap mountings, square flange

Dimensions in millimetres

Bore	Rod ^a MM	TF js13	FB ^d H13	R js13	ZJ ^b	UG max.
250	140	380	30	235	420	445
	180					
320	180	472	36	283	475	549
	220					
360 ^c	180	528	39	305	530	611
	250					
400	220	588	45	340	580	683
	280					
500	280	740	56	425	710	858
	360					

^a Other piston rod sizes that appear in ISO 3320 may be used.^b Tolerance on dimension, ZJ, is dependent on stroke (see Table 10).^c 360 mm bore is a non-preferred size.^d Hole in accordance with ISO 273, medium.

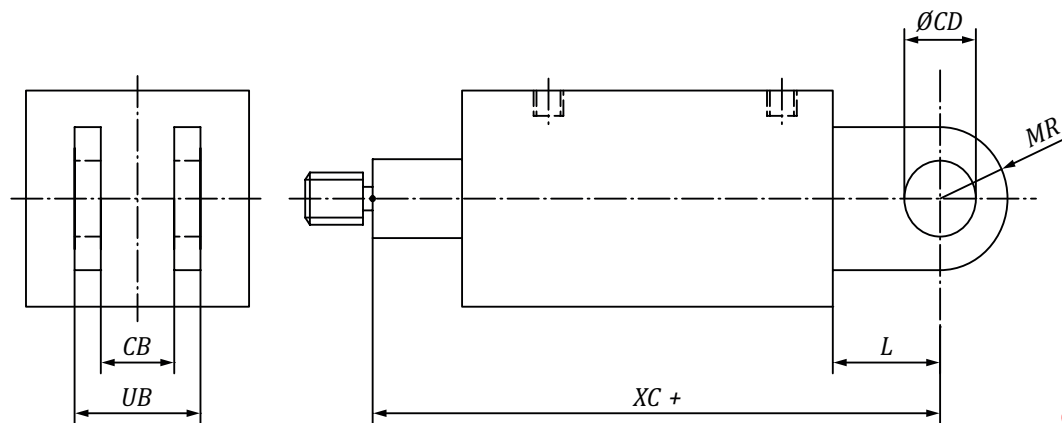


Figure 4 — MP 1 — Cap mounting, fixed clevis

Table 4 — Dimensions of cap mountings, fixed clevis

Dimensions in millimetres

Bore	Rod ^a MM	CB A16	CD H9	MR max.	L min.	XC ^b	UB max.
250	140	90	90	100	125	545	180
	180						
320	180	110	110	120	152	627	220
	220						
360 ^c	180	125	125	140	175	705	250
	250						
400	220	140	140	160	195	775	280
	280						
500	280	180	180	200	250	960	360
	360						

^a Other piston rod sizes that appear in ISO 3320 may be used.

^b Tolerance on dimension, XC, is dependent on stroke (see [Table 10](#)).

^c 360 mm bore is a non-preferred size.

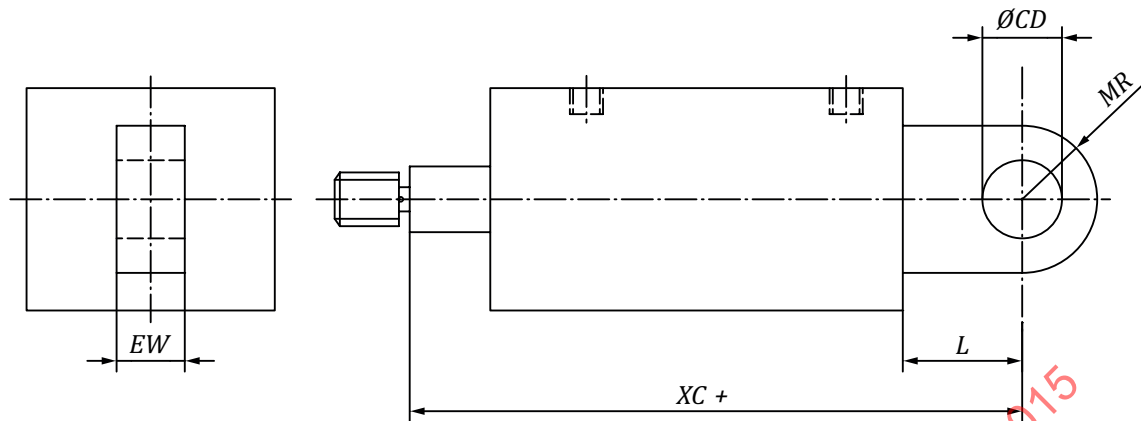


Figure 5 — MP 3 — Cap mounting, fixed eye

Table 5 — Dimensions of cap mountings, fixed eye

Dimensions in millimetres

Bore	Rod ^a MM	EW h14	CD H9	MR max.	L min.	XC ^b
250	140	90	90	100	125	545
	180					
320	180	110	110	120	152	627
	220					
360 ^c	180	125	125	140	175	705
	250					
400	220	140	140	160	195	775
	280					
500	280	180	180	200	250	960
	360					

^a Other piston rod sizes that appear in ISO 3320 may be used.

^b Tolerance on dimension, XC, is dependent on stroke (see [Table 10](#)).

^c 360 mm bore is a non-preferred size.

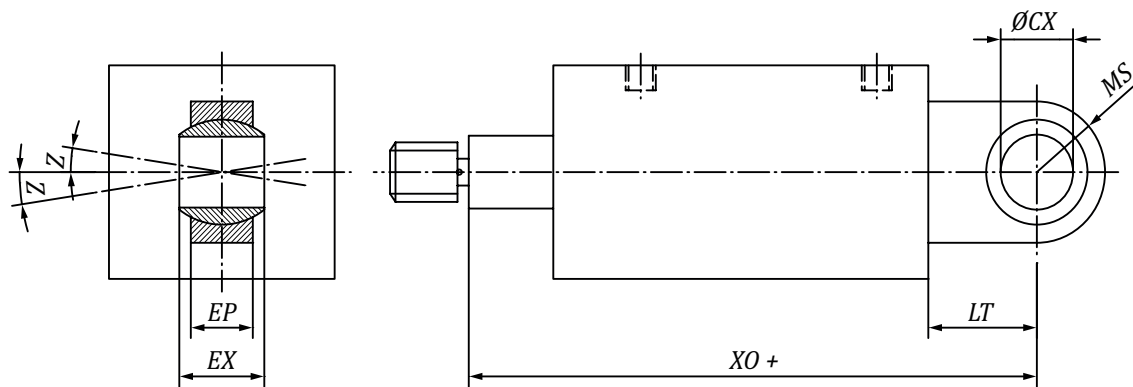


Figure 6 — MP 5 — Cap mounting, fixed eye with spherical plain bearing

Table 6 — Dimensions of cap mountings, fixed eye with spherical plain bearing

Dimensions in millimetres

Bore	Rod ^a MM	EP max.	EX 0 -0,25	CX	MS max.	LT min.	XO ^b	Tilting angle Z min.
250	140	102	125	125	160	160	580	4°
	180			125	160	160	580	
320	180	130	160	160	200	200	675	
	220			160	200	200	675	
360 ^c	180	130	160	160	200	200	730	
	250			160	200	200	730	
400	220	162	200	200	250	250	830	
	280			200	250	250	830	
500	280	192	250	250	320	320	1 030	
	360			250	320	320	1 030	

^a Other piston rod sizes that appear in ISO 3320 may be used.

^b Tolerance on dimension, XO, is dependent on stroke (see Table 10).

^c 360 mm bore is a non-preferred size.

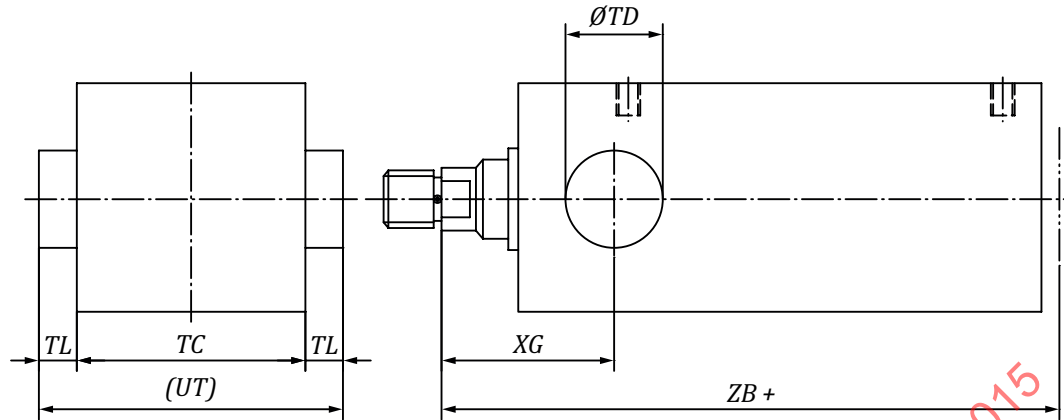


Figure 7 — MT 1 — Head mounting, integral trunnion (male)

Table 7 — Dimensions of head mountings, integral trunnion (male)

Dimensions in millimetres

Bore	Rod ^a MM	TC h14	UT ref.	TD f8	XG ±2	TL js13	ZB ^b
250	140	320	520	125	178	100	505
	180						
320	180	400	650	160	195	125	580
	220						
360 ^c	180	450	740	180	205	145	640
	250						
400	220	500	820	200	215	160	685
	280						
500	280	630	1030	250	240	200	825
	360						

^a Other piston rod sizes that appear in ISO 3320 may be used.

^b Tolerance on dimension, ZB, is dependent on stroke (see [Table 10](#)).

^c 360 mm bore is a non-preferred size.

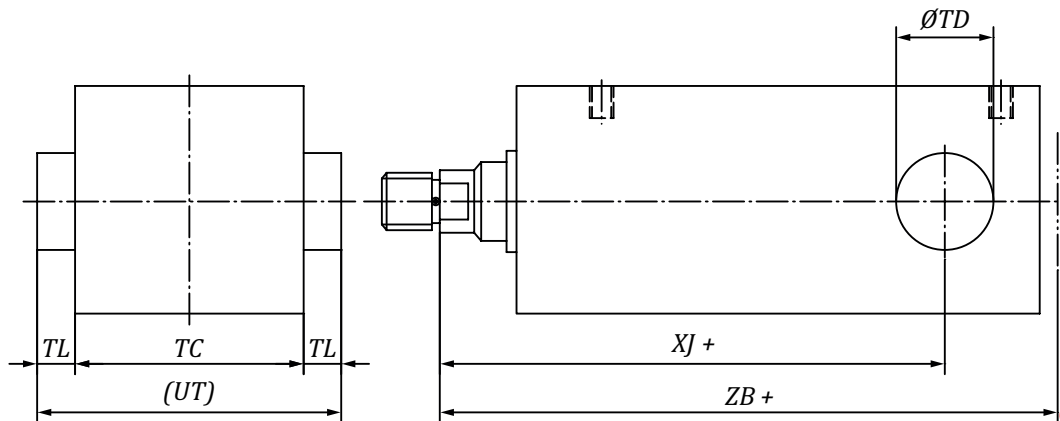


Figure 8 — MT 2 — Cap mounting, integral trunnion (male)

Table 8 — Dimensions of cap mountings, integral trunnion (male)

Dimensions in millimetres

Bore	Rod ^a MM	TC h14	UT ref.	TD f8	XJ ^b	TL js13	ZB ^b
250	140	320	520	125	393	100	505
	180						
320	180	400	650	160	450	125	580
	220						
360 ^c	180	450	740	180	500	145	640
	250						
400	220	500	820	200	525	160	685
	280						
500	280	630	1030	250	615	200	825
	360						

^a Other piston rod sizes that appear in ISO 3320 may be used.

^b Tolerances on dimensions XJ and ZB , are dependent on stroke (see [Table 10](#)).

^c 360 mm bore is a non-preferred size.