



IPH_T

An ISO 9001 Company

IPH_T Series 3

Mounting dimensions for Single rod cylinders, 16 MPa (160 bar) series

IPH: Series 3 establishes metric mounting dimensions for compact series cylinders, 16 MPa [160 bar 1]], as required for interchangeability of commonly-used hydraulic cylinders.

NOTE IPH: Series 3 allows manufacturers of hydraulic equipment flexibility in the design of metric cylinders and does not restrict technical development; however, it does provide basic guidelines.

References

The following referenced documents are applicable.

Sr No	Reference	Application
1	ISO 273	Fasteners, Clearance holes for bolts and screws
2	ISO 3320	Fluid power systems and components — Cylinder bores and pistons rod diameters — Metric series
3	ISO 4395	Fluid power systems and components — Cylinders — Piston rod thread dimensions and types
4	ISO 5598	Fluid power systems and components — Vocabulary
5	ISO 6162-1	Hydraulic fluid power — Flange connectors with split or one-piece flange clamps and metric or inch screws — Part 1: Flange connectors for use at pressures of 3,5 MPa (35 bar) to 35 MPa (350 bar), DN 13 to DN 127
6	ISO 6162-2	Hydraulic fluid power — Flange connectors with split or one-piece flange clamps and metric or inch screws — Part 2: Flange connectors for use at pressures of 35 MPa (350 bar) to 40 MPa (400 bar), DN 13 to DN 51

Technical Information

Sr No	Part	Construction Details
1	Barrel	ST-52, ASTM A-106 Gr. B Flanges are welded, machined and honed to 0.4 micron finish
2	Piston Rod	Made from medium Carbon Steel, ground, hard chrome plated and super finished
3	End Covers	Made from Steel IS 2062, Machined. CNC finish available for quantities
4	Gland	As three options, PB Bush, Cast or made from Steel directly. Bush is inserted for smooth operation of piston rod and for suitable guidance
5	Mounting	Multiple mountings are available and correspond to as per ISO 6020-3
6	Self-Aligning Cushioning Boss	Enable accurate movement inside cushioning chamber at the end of stroke
7	Cushioning Screws	For free adjustment is available as an option
8	Air Bleed	Screw provided for releasing trapped air in cylinder

More Information

Standards: The installation dimensions and mounting types of the cylinders comply with standards ISO 6020 - 3

Nominal pressure: 160 bar (16 MPa)

Static test pressure: 240 bar (24 MPa)

Higher operating pressures up to 450 bar on request.

Minimum pressure: Depending on the application, a certain minimum pressure is required to ensure proper operation of the cylinder. If no load is applied, we recommend a minimum pressure of 10 bar for single-rod cylinders.

Installation position: Optional

Hydraulic fluid: Mineral oils DIN 51524 (HL, HLP)

Hydraulic fluid temperature range: -20 °C to +80 °C

Ambient temperature range: -20 °C to +80 °C

Viscosity range: 2.8 to 380 mm²/s

Cleanliness class to ISO

Permissible maximum degree of contamination of the hydraulic fluid to ISO 4406 (c) class 20/18/15.

Primer coating: As a standard, hydraulic cylinders are primed with one coating in a thickness max. 80 microns

SEALS

Sr No	Seal Type	Description
1	Piston Seal	Based on ISO 7425-1 and ISO 10766
2	Piston Seal	DAS™ variation for holding power
3	Gland Seal	Dimensions correspond generally to RU3 ISO 5597
4	Wiper	Dimensions correspond generally to ISO 6195. Metallic Wipers available for high temperature (+80C).
5	Static	Nitrile Rubber 'O' Rings

Viton based variations are available for high temperature (> 80 degrees or > 176 Fahrenheit) applications

Bore sizes

IPH_r Series 3 covers the following bore sizes, expressed in millimetres, in accordance with ISO 3320:1987

250-320-360-400-500

NOTE

Mounting dimensions for compact hydraulic single rod cylinders with bores < 250 specified in IPH_r Series 3.

Table 1 — General dimensions

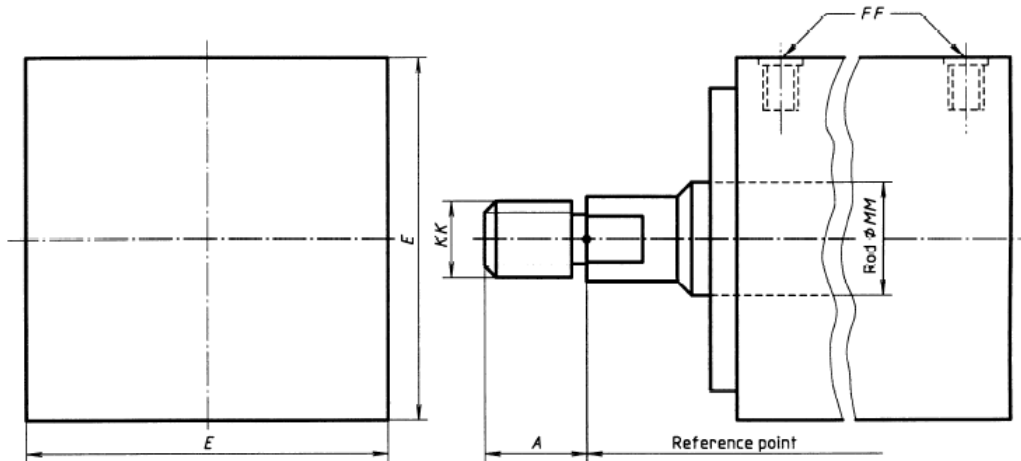


Figure 1 — General dimensions

Table 1 — General dimensions and part sizes

Dimensions in millimetres

Bore	Rod ¹⁾ MM	KK	A	E max.	FF ²⁾
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 ³⁾	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		

1) Other piston rods that appear in ISO 3320 may be used.

2) See ISO 6162 for flange port dimensions.

3) 360 mm bore is a non-preferred size.

Table 2 — Dimensions of head mountings, square flange

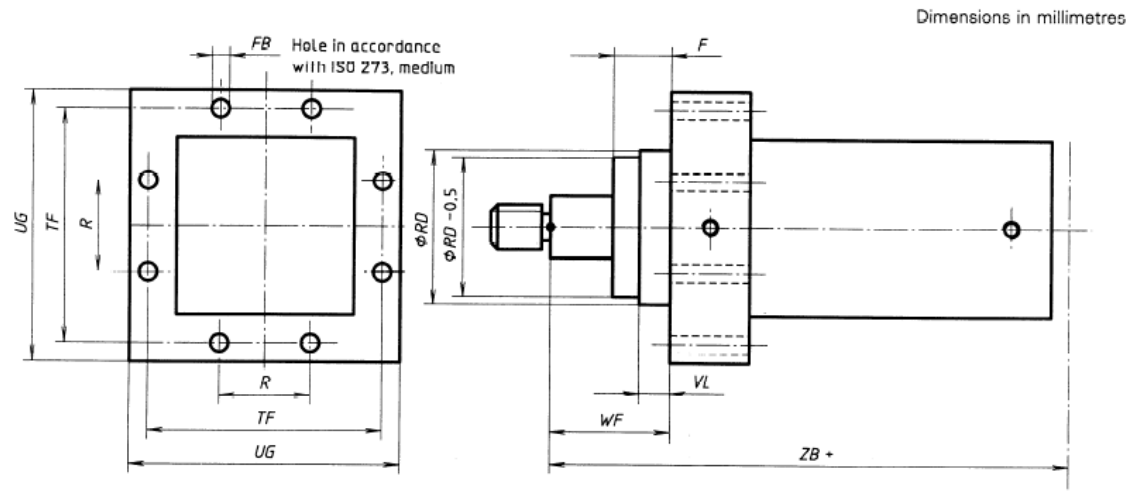


Figure 2 — MF5 — Head mounting, square flange

Table 2 — Dimensions of head mountings, square flange

Dimensions in millimetres

Bore	Rod ¹⁾ MM	RD 18	TF	FB	R	WF	F max.	VL min.	UG max.	ZB 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 ²⁾	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									

1) Other piston rods that appear in ISO 3320 may be used.
2) 360 mm bore is a non-preferred size.

Table 3 — Dimensions of cap mountings, square flange

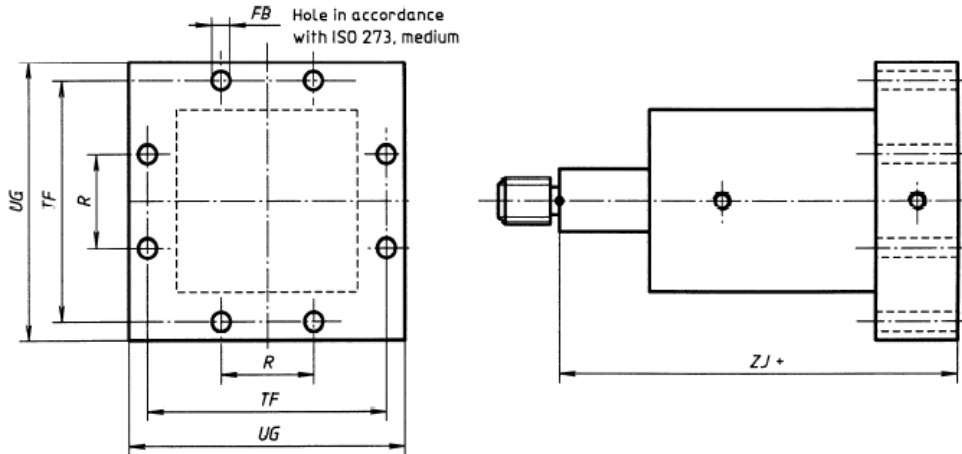


Figure 3 — MF6 — Cap mounting, square flange

Table 3 — Dimensions of cap mountings, square flange

Dimensions in millimetres

Bore	Rod ¹⁾ MM	TF	FB	R	ZJ	UG max.
250	140	380	30	235	420	445
	180					
320	180	472	36	283	475	549
	220					
360 ²⁾	180	528	39	305	530	611
	250					
400	220	588	45	340	580	683
	280					
500	280	740	56	425	710	858
	360					

1) Other piston rods that appear in ISO 3320 may be used.
2) 360 mm bore is a non-preferred size.

Table 4 — Dimensions of cap mountings, fixed clevis

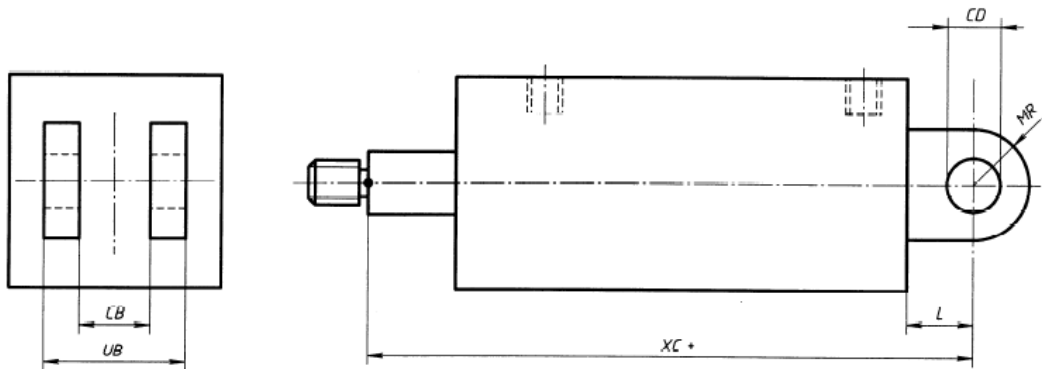


Figure 4 — MP1 — Cap mounting, fixed clevis

Table 4 — Dimensions of cap mountings, fixed clevis

Dimensions in millimetres

Bore	Rod ¹⁾ MM	CB	CD	MR max.	L min.	XC	UB
250	140	90	90	100	125	545	180
	180						
320	180	110	110	120	152	627	220
	220						
360 ²⁾	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						

1) Other piston rods that appear in ISO 3320 may be used.
2) 360 mm bore is a non-preferred size.

Table 5 — Dimensions of cap mountings, fixed eye

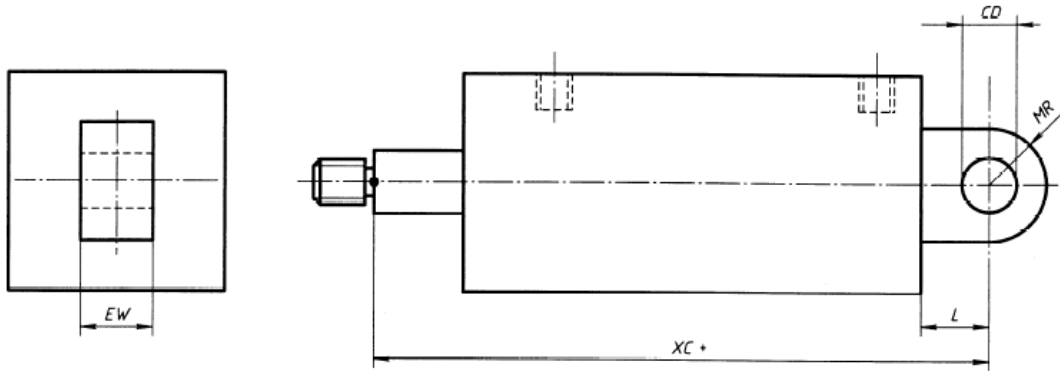


Figure 5 — MP3 — Cap mounting, fixed eye

Table 5 — Dimensions of cap mountings, fixed eye

Dimensions in millimetres

Bore	Rod ¹⁾ MM	EW	CD	MR max.	L min.	XC
250	140	90	90	100	125	545
	180					
320	180	110	110	120	152	627
	220					
360 ²⁾	180	125	125	140	175	705
	250					
400	220	140	140	160	195	775
	280					
500	280	180	180	200	250	960
	360					

1) Other piston rods that appear in ISO 3320 may be used.

2) 360 mm bore is a non-preferred size.

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

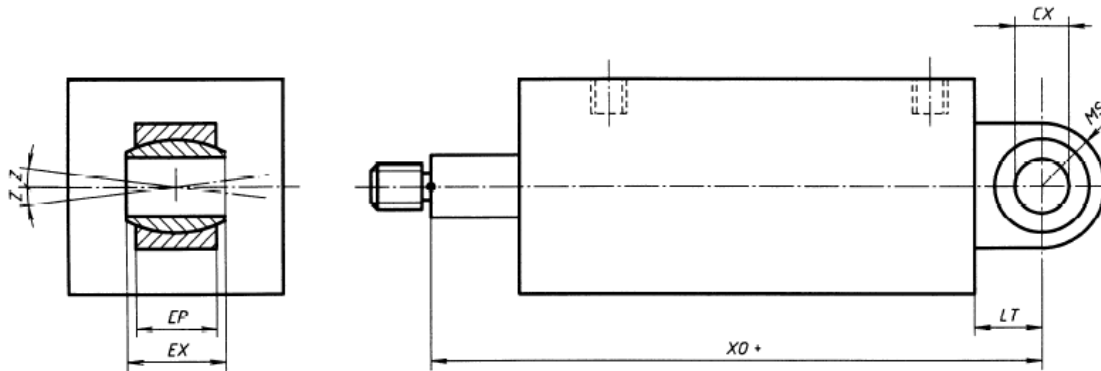


Figure 6 — MP5 — Cap mounting, fixed eye with spherical plain bearing

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

Dimensions in millimetres

Bore	Rod ¹⁾ MM	EP	EX	CX	MS max.	LT	XO	Tilting angle Z min.
250	140	102	125	125	160	160	580	4°
	180							
320	180	130	160	160	200	200	675	
	220							
360 ²⁾	180	130	160	160	200	200	730	
	250							
400	220	162	200	200	250	250	830	
	280							
500	280	192	250	250	320	320	1 030	
	360							

1) Other piston rods that appear in ISO 3320 may be used.

2) 360 mm bore is a non-preferred size.

Table 3 — Dimensions of head mountings, integral trunnion (male)

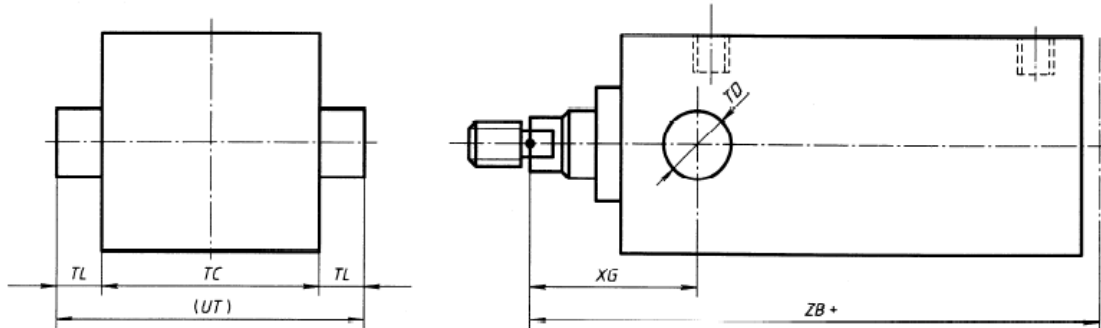


Figure 7 — MT1 — Head mounting, integral trunnion (male)

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

Dimensions in millimetres

Bore	Rod ¹⁾ MM	TC	UT	TD	XG	TI	ZB max.
250	140	320	520	125	178	100	505
	180						
320	180	400	650	160	195	125	580
	220						
360 ²⁾	180	450	740	180	205	145	640
	250						
400	220	500	820	200	215	160	685
	280						
500	280	630	1 030	250	240	200	825
	360						

1) Other piston rods that appear in ISO 3320 may be used.
2) 360 mm bore is a non-preferred size.

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

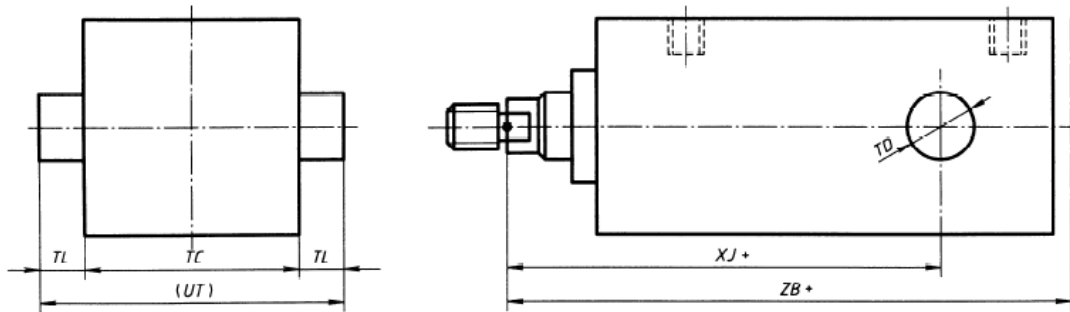


Figure 8 — MT2 — Cap mounting, integral trunnion (male)

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

Dimensions in millimetres

Bore	Rod ¹⁾ MM	TC	UT	TD	XJ	TL	ZB max.
250	140	320	520	125	393	100	505
	180						
320	180	400	650	160	450	125	580
	220						
360 ²⁾	180	450	740	180	500	145	640
	250						
400	220	500	820	200	525	160	685
	280						
500	280	630	1 030	250	615	200	825
	360						

1) Other piston rods that appear in ISO 3320 may be used.
2) 360 mm bore is a non-preferred size.

Table 9 — Dimensions of mountings with intermediate trunnion fixed or movable trunnions (male)

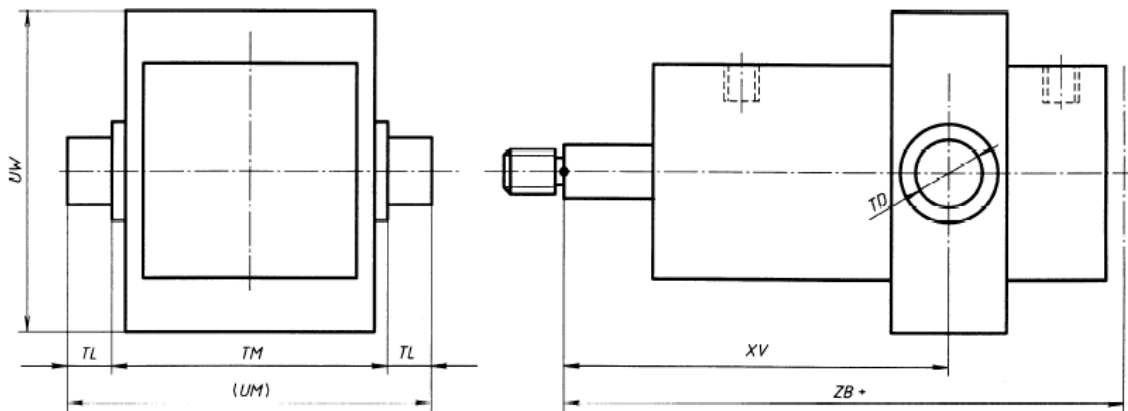


Figure 9 — MT4 — Mounting with intermediate fixed or movable trunnions (male)

Table 9 — Dimensions of mountings with intermediate fixed or movable trunnions (male)

Dimensions in millimetres

Bore	Rod ¹⁾ MM	UW max.	TM	UM	TD	XV	ZB max.	TL
250	140	480	380	580	125	variable ³⁾	460	100
	180							
320	180	600	485	735	160		520	125
	220							
360 ²⁾	180	675	545	835	180		575	145
	250							
400	220	750	605	925	200		625	160
	280							
500	280	945	745	1 145	250	775	200	
	360							

1) Other piston rods that appear in ISO 3320 may be used.

2) 360 mm bore is a non-preferred size.

3) XV min., XV max. and minimum stroke shall be as agreed between the manufacturer and user.

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