



**GUIDING ELEMENTS
AFNOR/CNOMO**

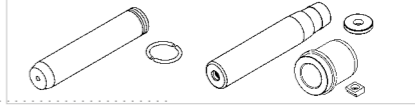
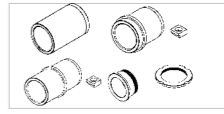
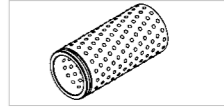
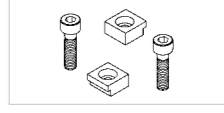
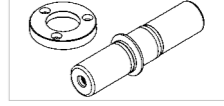
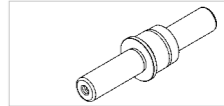

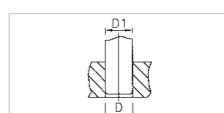



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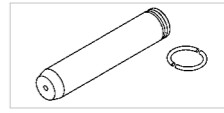
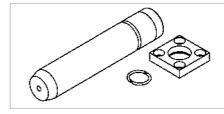
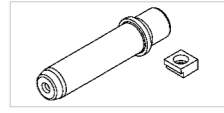
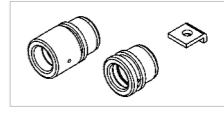
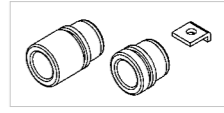

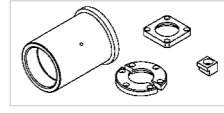

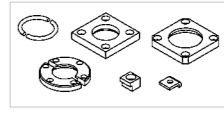


BALL BEARING GUIDING ELEMENTS AFNOR/CNOMO NORM CONTENTS

■ General information				5
■ Ordering example				7
■ Guide pillar		CA EB BA		9
■ Guide bush		HB JB NB GB		10
■ Ball bearing cage		PA		11
■ Strokes				12
■ Clamp positions				13
■ Demountable pillar		EPO		14
■ Middle pillar		CMF		15
■ Retaining bush		BAD		16
■ Assembly tolerances				17
■ Accessories				18



PLAIN BEARING GUIDING ELEMENTS AFNOR/CNOMO NORM CONTENTS

■ Guide Pillar, 1/2 snap-ring lower clamping		RI	20
■ Guide Pillar, 1/2 snap-rings medium clamping		RM	21
■ Disassembling guide pillar with fixing clamps		RID	22
■ Bronze Guide Bush with collar		BRO	23
■ «Aluanodised» Guide Bush with collar		ALU	24
■ Steel Guide Bush with collar		ACI	25
■ Prive Fit Bronze Guide Bush with collar		BCA	26
■ Bronze demountable Guide Bush with Graphite Inserts ...		BBEI	27
■ Accessories (P01-B03-BC-B05-BDR-BRCB)			28-29

DESCRIPTION OF "GUIDABILLE"® BALL BEARING GUIDES - GB Standard

The "GUIDABILLE" is a guide element that allows the following movements:
 TRANSLATION and ROTATION, plus SIMULTANEOUS TRANSLATION and ROTATION.
 These movements are performed with negligible energy expenditure (very low coefficient of friction: between 0.0009 and 0.0015).

THE "GUIDABILLE" HAS THREE MAIN COMPONENTS

ONE PILLAR made from 13-chrome steel, core-hardened, ground between centres and superfinished, offering very high wear and impact-resistance (62-64 HRC).

This pillar can be: DEMOUNTABLE: with a tapered shank.
 FIXED: by force-fitting on a press.

ONE BALL BEARING CAGE, consisting of :

- One bronze bush (to prevent oxidation)
- High-precision ball bearings made from the highest quality steel:
- The spiral configuration means that each ball bearing has its own roller track, thus evenly distributing the loads throughout the pillar.

ONE GUIDE BUSH made from high-strength bearing steel that has been tempered, ground and polished.

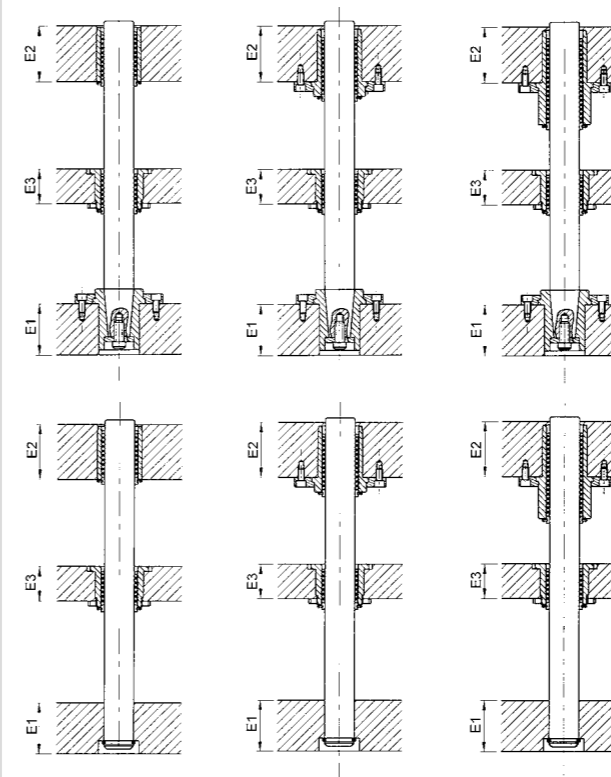
ADVANTAGES

Extremely accurate guiding.
 For applications with high stroke rates.
 Operates at both high and low speeds with virtually no friction and no need for maintenance.
 Minimal wear due to the use of high-strength steel.
 RENARD SERIES standardised dimensions.
 We keep large stocks for immediate deliveries.

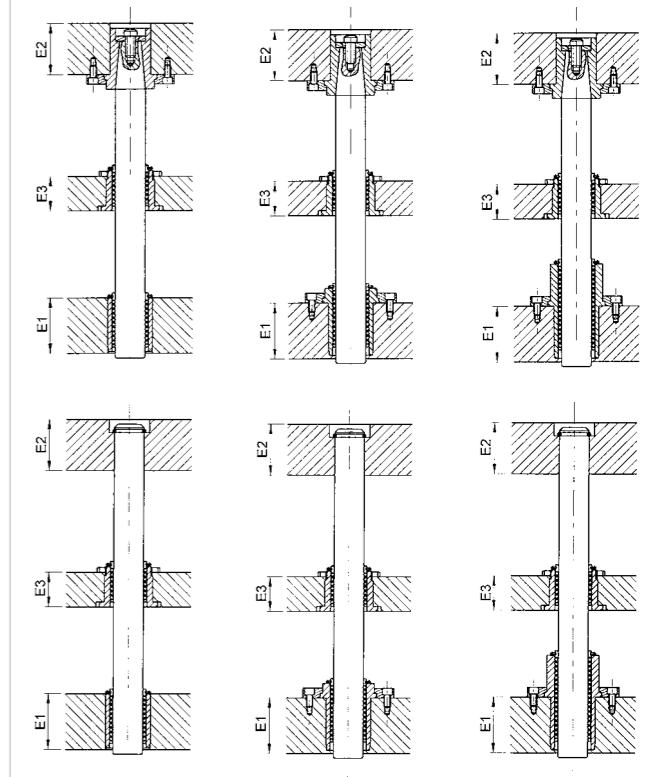
APPLICATIONS

Originally designed for die sets, the "GUIDABILLE" is also used in numerous applications in all industries:
 - As STANDARDISED PARTS - the subject of this catalogue.
 - As SPECIALLY DESIGNED PARTS, upon request.

PILLARS INSERTED INTO THE BASE PLATE



PILLARS INSERTED INTO THE TOP PLATE



MATCHING OF BUSHES AND PILLARS

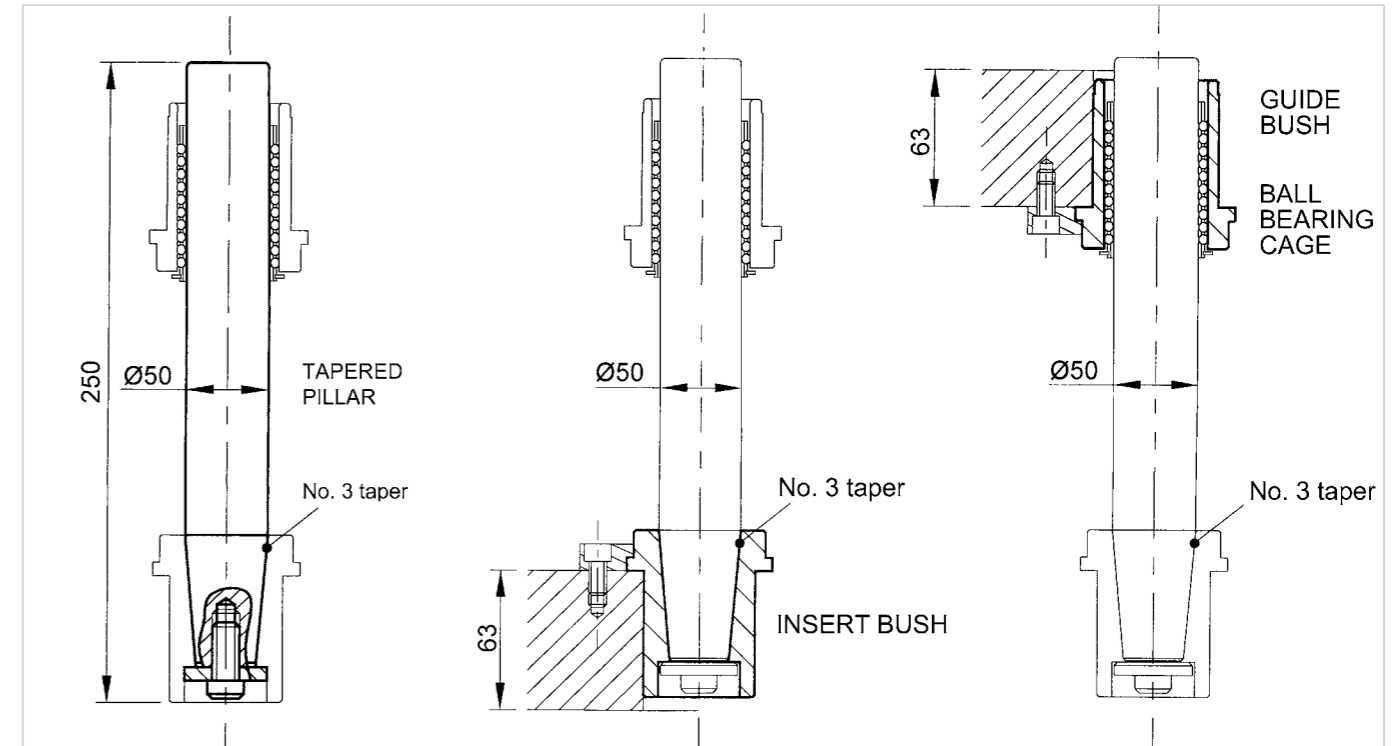
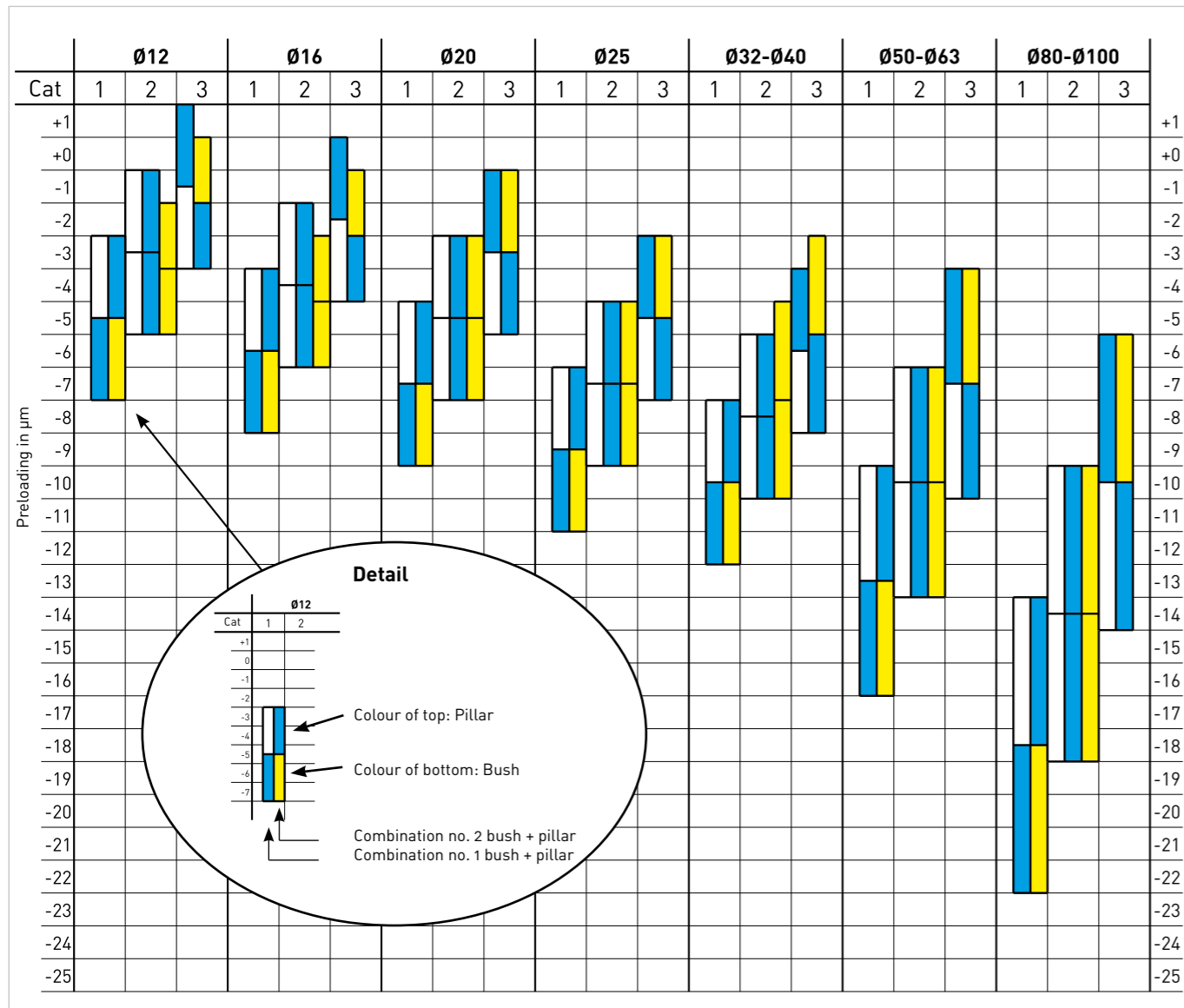
By matching bushes and pillars, we can offer you three adjustment categories:

- CATEGORY 1**
 - For the cutting of very fine sheet metal.
 - For clearance between punch and die of less than 0.02 mm per side.
- CATEGORY 2**
 - For the cutting of sheet metal more than 0.4 mm thick
 - For clearance between punch and die of 0.02 to 0.06 mm per side.
 - For most applications.
- CATEGORY 3**
 - For clearance between punch and die of 0.08 mm per side.
 - For die-stamping tools.

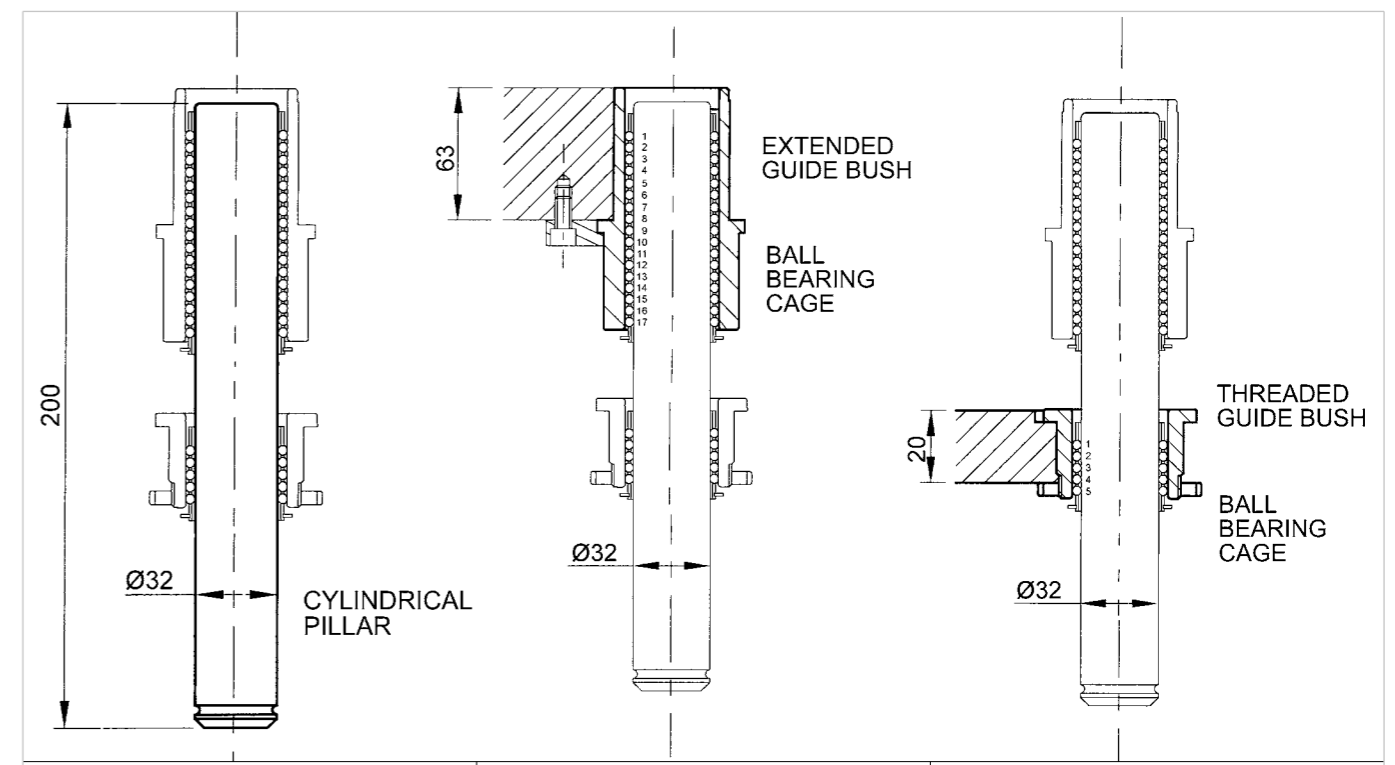
To facilitate the identification of these three operating categories, our bushes and pillars have been colour-coded (in white, blue and yellow). The aforementioned categories are obtained by combining bushes and pillars (see graph below).

E.g. : for a Ø12 guide, the preloading in Category 1 is between -3 and -7 µm. Category 1 can be obtained by combining a white pillar with a blue bush, or by combining a blue pillar with a yellow bush.

When ordering, please specify the desired category. If no information is given, your order will be delivered as a Category 2 item by default.



Ref. : CA.050.250.3	Ref. : EB.050.063.3	Ref. : HB.050.063 PA.050.10
To order 4 "Guidabilles", please state :		
4 CA.050.250.3	4 PA.050.10	
4 EB.050.063.3	16 B03.008.000 (mounting clamp)	
4 HB.050.063		



Ref. : BA.032.200	Ref. : JB.032.050 PA.032.17	Ref. : NB.032.020 PA.032.05
To order 2 "Guidabilles", please state :		
2 BA.032.200	2 PA.032.17	
2 JB.032.050	2 PA.032.05	
2 NB.032.020	4 B03.006.000 (mounting clamp)	

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According to AFNOR standards NF E 63.120/121/122/123/124/125.

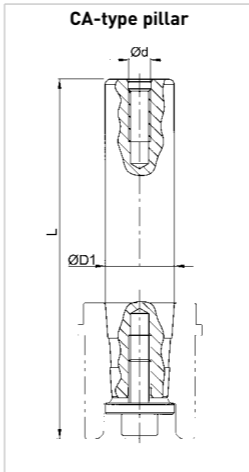
Please note
The reference indices for taper 1 - 2 or 3 (e.g. CA.040.250.2 and CA.040.250.3) mean that for the pillar in question, there are 2 taper lengths (2 and 3 respectively). The pillars CA and bushes EB must have the same length of taper. E.g. CA.040.250.3 with EB.040.050.3 or CA.040.250.2 with EB.040.063.2)

Important note
Some of these parts have MABEC codes.

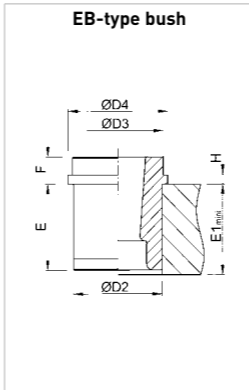
Key for CA-type pillars

On request

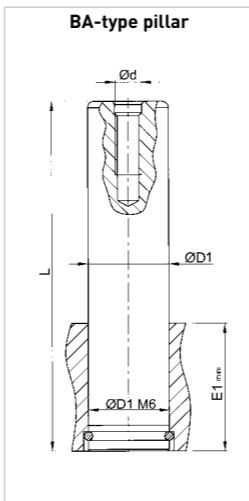
Available in taper 1(x=1) and 2 (x=2) Available in taper 2 (x=2) and 3 (x=3)



ØD1	12	16	20	25	32	40	50	63	80	100
L	REFERENCE									
100	CA.012.100.1									
110	CA.012.110.1	CA.016.110.1								
125	CA.012.125.1	CA.016.125.1	CA.020.125.1							
140		CA.016.140.1	CA.020.140.1	CA.025.140.x						
160		CA.016.160.1	CA.020.160.1	CA.025.160.x	CA.032.160.x					
180		CA.016.180.1	CA.020.180.1	CA.025.180.x	CA.032.180.x	CA.040.180.x				
200		CA.016.200.1	CA.020.200.1	CA.025.200.x	CA.032.200.x	CA.040.200.x	CA.050.200.3			
224				CA.025.224.x	CA.032.224.x	CA.040.224.x	CA.050.224.3			
250				CA.025.250.x	CA.032.250.x	CA.040.250.x	CA.050.250.3	CA.063.250.3		
280					CA.032.280.x	CA.040.280.x	CA.050.280.x	CA.063.280.3		
315						CA.040.315.x	CA.050.315.x	CA.063.315.3	CA.080.315.3	
355							CA.050.355.x	CA.063.355.x	CA.080.355.3	
400							CA.050.400.x	CA.063.400.x	CA.080.400.3	CA.100.400.3
450								CA.063.450.x	CA.080.450.3	CA.100.450.3
500								CA.063.500.x	CA.080.500.3	CA.100.500.3
Ød	M5	M6	M8	M8	M8	M8	M10	M10	M12	M12



ØD1	12	16	20	25	32	40	50	63	80	100
E1 min.	REFERENCE									
E										
25	23	EB.012.025.1								
32	30		EB.016.032.1							
40	38			EB.020.040.1	EB.025.040.2					
50	48				EB.025.050.1	EB.032.050.2	EB.040.050.3			
63	61					EB.032.063.1	EB.040.063.2	EB.050.063.3		
80	78							EB.050.080.2	EB.063.080.3	
100	98								EB.063.100.2	EB.080.100.3
125	123									EB.100.125.3
F	10	10	12	12	15	15	18	20	20	20
ØD2	22	28	32	40	50	63	80	90	110	140
ØD3	-	-	-	-	-	-	-	100	125	160
ØD4	25	32	36	45	56	70	90	110	135	170
H	3	3	4	4	5	5	6	10	10	10



ØD1	12	16	20	25	32	40	50	63	80	100
L	REFERENCE									
100	BA.012.100	BA.016.100	BA.020.100							
110	BA.012.110	BA.016.110	BA.020.110	BA.025.110						
125	BA.012.125	BA.016.125	BA.020.125	BA.025.125	BA.032.125					
140	BA.012.140	BA.016.140	BA.020.140	BA.025.140	BA.032.140					
160	BA.012.160	BA.016.160	BA.020.160	BA.025.160	BA.032.160	BA.040.160				
180		BA.016.180	BA.020.180	BA.025.180	BA.032.180	BA.040.180				
200		BA.016.200	BA.020.200	BA.025.200	BA.032.200	BA.040.200	BA.050.200			
224				BA.025.224	BA.032.224	BA.040.224	BA.050.224			
250				BA.025.250	BA.032.250	BA.040.250	BA.050.250	BA.063.250		
280					BA.032.280	BA.040.280	BA.050.280	BA.063.280		
315					BA.032.315	BA.040.315	BA.050.315	BA.063.315	BA.080.315	
355						BA.040.355	BA.050.355	BA.063.355	BA.080.355	BA.100.355
400						BA.040.400	BA.050.400	BA.063.400	BA.080.400	BA.100.400
450							BA.050.450	BA.063.450	BA.080.450	BA.100.450
500							BA.050.500	BA.063.500	BA.080.500	BA.100.500
E1 min.	20	25	32	40	50	63	80	100	125	160
Ød	M5	M6	M8	M8	M8	M8	M10	M10	M12	M12

GUIDE BUSH

HB
JB
NB
GB



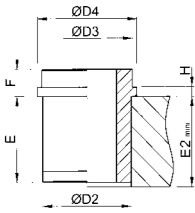
Compliant with AFNOR standards NF E 63.120/121/122/123/124/125.

TO DETERMINE THE CORRECT "GUIDABILLE"

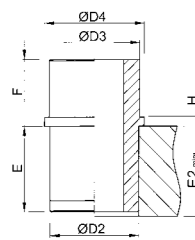
- 1) Choose the type of pillar BA or CA/EB and the length according to the die height (DH).
- 2) Choose the type of bush HB or JB (avoid GB) and check that the stroke V corresponds to your needs.
- 3) When you have determined the type of bush HB or JB, check that your plate has the correct thickness to accomodate your bush and read off horizontally towards the right where you will automatically find the ball bearing cage PA.

Legend ■ On request

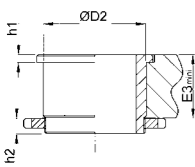
ØD1	12	16	20	25	32	40	50	63	80	100
ØD2	22	28	32	40	50	63	80	90	110	140
ØD3	-	-	-	-	-	-	-	100	125	150
ØD4	25	32	36	45	56	70	90	110	135	160
H	3	3	4	4	5	5	6	10	10	10

EB-type bush

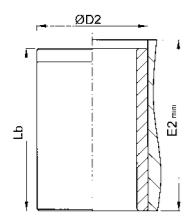
ØD1	12	16	20	25	32	40	50	63	80	100
E2 min.	E	REFERENCE								
25	23	HB.012.025	HB.016.025	HB.020.025						
32	30	HB.012.032	HB.016.032	HB.020.032	HB.025.032					
40	38	HB.012.040	HB.016.040	HB.020.040	HB.025.040	HB.032.040				
50	48		HB.016.050	HB.020.050	HB.025.050	HB.032.050	HB.040.050			
63	61			HB.020.063	HB.025.063	HB.032.063	HB.040.063	HB.050.063		
80	78				HB.025.080	HB.032.080	HB.040.080	HB.050.080		
100	98						HB.040.100	HB.050.100	HB.063.100	
125	123							HB.063.125	HB.080.125	
160	158							HB.080.160	HB.100.160	
200	198								HB.100.200	
F	10	10	12	12	15	15	18	20	20	20

JB-type bush

ØD1	12	16	20	25	32	40	50	60	80	100
E2 min.	E	REFERENCE								
25	23	JB.012.025	JB.016.025							
32	30	JB.012.032	JB.016.032	JB.020.032	JB.025.032	JB.032.032				
40	38		JB.016.040	JB.020.040	JB.025.040	JB.032.040	JB.040.040	JB.050.040		
50	48			JB.020.050	JB.025.050	JB.032.050	JB.040.050	JB.050.050		
63	61				JB.025.063	JB.032.063	JB.040.063	JB.050.063		
80	78						JB.040.080	JB.050.080		
100	98						JB.050.100	JB.063.100		
125	123							JB.063.125	JB.080.125	
160	158							JB.080.160	JB.100.160	
200	198								JB.100.200	
F	25	32	36	40	45	50	63	63	70	80

NB-type bush

ØD1	12	16	20	25	32	40	50	63	80	100
E3 min.	REFERENCE									
12	NB.012.012	NB.016.012								
16		NB.016.016	NB.020.016							
20			NB.020.020	NB.025.020	NB.032.020					
25				NB.025.025	NB.032.025	NB.040.025				
32					NB.032.032	NB.040.032	NB.050.032			
40						NB.040.040	NB.050.040			
h1	2	3	3	3	4	4	5			
h2	4	4	5	6	6	7	9			

GB-type bush

ØD1	12	16	20	25	32	40	50	63	80	100
E2 min.	L	REFERENCE								
32	30	GB.012.032	GB.016.032	GB.020.032						
40	38	GB.012.040	GB.016.040	GB.020.040	GB.025.040					
50	48	GB.012.050	GB.016.050	GB.020.050	GB.025.050	GB.032.050				
63	61			GB.020.063	GB.025.063	GB.032.063	GB.040.063			
80	78			GB.020.080	GB.025.080	GB.032.080	GB.040.080	GB.050.080		
100	98					GB.032.100	GB.040.100	GB.050.100		
125	123						GB.040.125	GB.050.125		
160	158							GB.050.160		

BALL BEARING CAGE

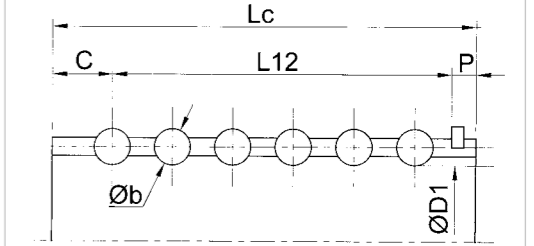
PA



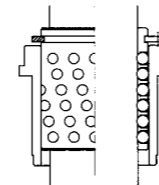
According to AFNOR standards NF E 63.120/121/122/123/124/125.

For special applications, it is possible to mount ball bearing cages that are of different lengths to the guide bushes.

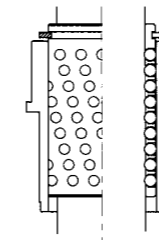
Legend ■ On request



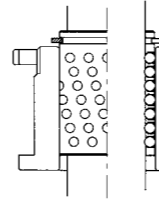
ØD1	12	16	20	25	32	40	50	63	80	100
Øb	2	2	2,5	3,5	4	5	6,5	6	6	7,5
P	2,6	2,8	2,8	3,6	3,9	3,9	4,2	5,2	6,2	8,2
C	3	3	3,3	3,9	4,6	5,3	6	6	7	7
Lc	See table on page opposite									

PA-type ball bearing cage

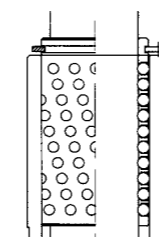
ØD1	12	16	20	25	32	40	50	63	80	100
Height HB	REFERENCE									
25	PA.012.11	PA.016.11	PA.020.10							
32	PA.012.13	PA.016.13	PA.020.12	PA.025.09						
40	PA.012.16	PA.016.16	PA.020.14	PA.025.11	PA.032.09					
50		PA.016.19	PA.020.17	PA.025.13	PA.032.11	PA.040.09				
63			PA.020.20	PA.025.15	PA.032.14	PA.040.11	PA.050.10			
80				PA.025.19	PA.032.17	PA.040.14	PA.050.12			
100						PA.040.16	PA.050.14	PA.063.14		
125								PA.063.17	PA.080.17	
160									PA.080.21	PA.100.18
200										PA.100.22

PA-type ball bearing cage

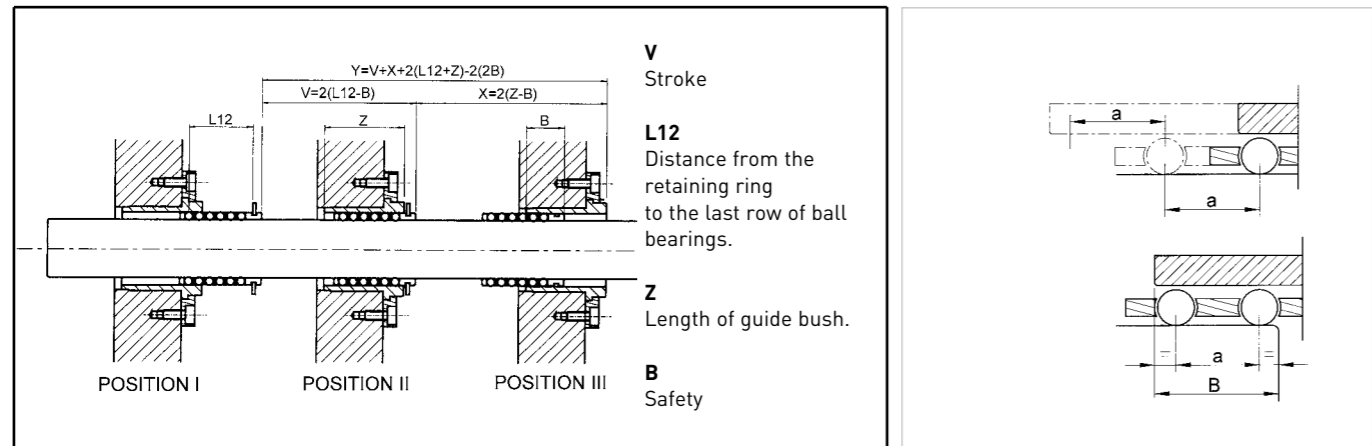
ØD1	12	16	20	25	32	40	50	63	80	100
Height JB	REFERENCE									
25	PA.012.16	PA.016.18								
32	PA.012.18	PA.016.20	PA.020.18	PA.025.15	PA.032.13					
40		PA.016.24	PA.020.20	PA.025.17	PA.032.15	PA.040.13	PA.050.12			
50			PA.020.23	PA.025.19	PA.032.17	PA.040.14	PA.050.14			
63				PA.025.21	PA.032.19	PA.040.16	PA.050.15			
80						PA.040.19	PA.050.17			
100							PA.050.19	PA.063.19		
125								PA.063.22	PA.080.23	
160									PA.080.27	PA.100.24
200										PA.100.28

PA-type ball bearing cage

ØD1	12	16	20	25	32	40	50	63	80	100
Height NB	REFERENCE									
12	PA.012.05	PA.016.05								
16		PA.016.07	PA.020.06							
20			PA.020.07	PA.025.06	PA.032.05					
25				PA.025.07	PA.032.06	PA.040.05				
32					PA.032.07	PA.040.06	PA.050.05			
40						PA.040.07	PA.050.06			

PA-type ball bearing cage

ØD1	12	16	20	25	32	40	50	63	80	100
Height GB	REFERENCE									
32	PA.012.10	PA.016.10	PA.020.08							
40	PA.012.13	PA.016.13	PA.020.11	PA.025.08						
50	PA.012.16	PA.016.16	PA.020.13	PA.025.10	PA.032.09					
63			PA.020.17	PA.025.13	PA.032.11	PA.040.09				
80			PA.020.22	PA.025.17	PA.032.14	PA.040.11	PA.050.10			
100					PA.032.17	PA.040.14	PA.050.12			
125						PA.040.18	PA.050.15			
160							PA.050.19			

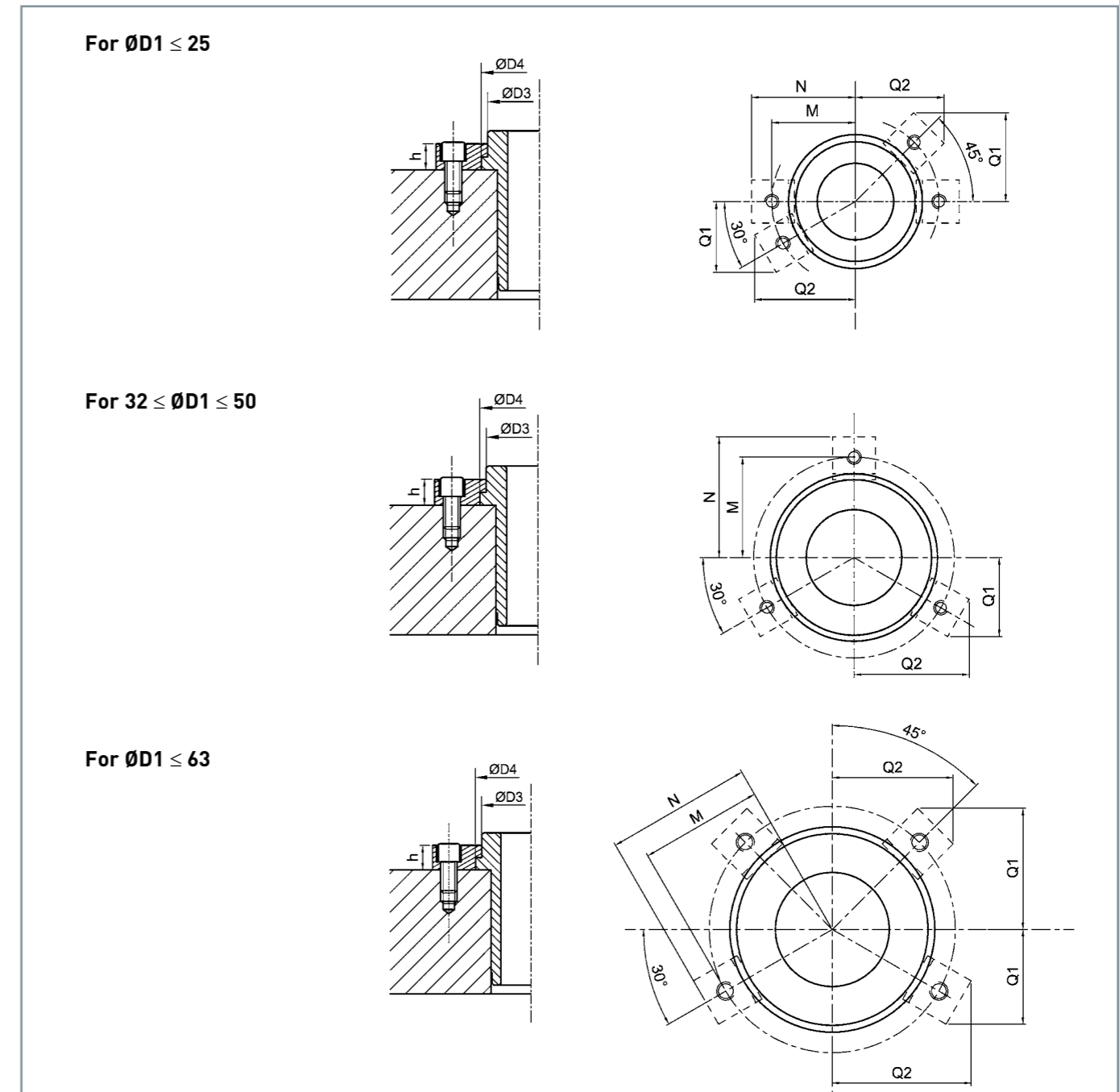


ØD1	12			16			20			25			32			40			50			63			80			100																
B	8			8			10			13			15			19			23			24			29			31																
Ht HB	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc
25	33	33	50	38,6	33	33	50	38,8	36,4	35	53	42,5																																
32	39	40	62	44,6	39	40	62	44,8	43,6	42	67	49,7	42,6	42	59	50,1																												
40	48	48	80	53,6	48	48	80	53,8	50,8	50	82	56,9	52	50	78	59,5	50,8	53	72	59,3																								
50					57	58	98	62,8	61,6	60	103	67,7	61,4	60	97	68,9	62	63	94	70,5	61,4	63	85	70,6																				
63								72,4	73	125	78,5	70,8	73	116	78,3	78,8	76	127	87,3	75	76	112	84,2	82,7	79	119	92,9																	
80										89,6	90	153	97,1	95,6	93	161	104,1	95,4	93	153	104,6	99,3	96	153	109,5																			
100																																												
125																																												
160																																												
200																																												

ØD1	12			16			20			25			32			40			50			63			80			100																				
Ht JB	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc
25	48	48	80	53,6	54	55	92	59,8																																								
32	54	55	92	59,6	60	62	104	65,8	65,2	66	110	71,3	70,8	70	116	78,3	73,1	75	116	81,6																												
40					72	70	128	77,8	72,4	74	125	78,5	80,2	78	134	87,7	84,4	83	139	92,9	88,6	88	139	97,8	99,3	101	153	109,5																				
50										83,2	84	146	89,3	89,6	88	153	97,1	95,6	93	161	104,1	95,4	98	153	104,6	115,9	111	186	126,1																			
63															99	101	172	106,5	106,8	106	184	115,3	109	111	180	118,2	124,2	124	202	134,4																		
80																																																
100																																																
125																																																
160																																																
200																																																

ØD1	12			16			20			25			32			40			50			63			80			100																				
Ht NB	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc
12	15	16	14	20,6	15	16	14	20,8																																								
16					21	20	26	26,8	22	21	24	28,1																																				
20										25,6	25	31	31,7	28,5	26	31	36	28,4	26	27	36,9																											
25														33,2	31	40	40,7	34	31	38	42,5	34,2	32	30	43,4																							
32																																																
40																																																

ØD1	12			16			20			25			32			40			50			63			80			100																				
Ht GB	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc
32	30	30	44	35,6	30	30	44	35,8	29,2	30	38	35,3																																				
40	39	38	62	44,6	39	38	62	44,8	40	38	60	46,1	37,9	38	50	45,4																																
50	48	48	80	53,6	48	48	80	53,8	47,2	48	74	53,3	47,3	48	69	54,8	50,8	48	72	59,3																												
63										61,6	61	103	67,7	61,4	61	97	68,9	62	61	94	70,5	61,4	61	85	70,6																							
80																																																
100																																																
125																																																
160																																																



ØD1	12	16	20	25	32	40	50	63	80	100	
ØD3	22	29	32	41	51	65	84	100	125	150	
ØD4	25	32	36	45	56	70	90	110	135	160	
M	17	20,5	23	27,5	35	42	54	65	77,5	95	
N	23	26,5	30	34,5	43,5	50,5	64	76	88,5	106	
T	5	5	7	7	9	9	11	18	18	18	
at 30°	Q1	16,7	18,4	21,1	23,3	29,5	33	41,5	49,3	61,8	
	Q2	22,9	25,9	29,5	33,4	42,2	48,2	60,9	72,3	98,3	
at 45°	Q1 = Q2	20,5	23	26,2	29,3	37,1	42,1	53	62,9	84,1	
Clamp	B03.004.000		B03.005.000		B03.006.000		B03.008.000		B03.010.000		
Screw	M4 x 12		M5 x 12		M6 x 12		M8 x 16		M10 x 25		
Quantity	2		2		3		3		4		



Core-hardened to 60 - 64 HRC

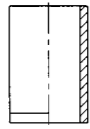
Ordering example:
Pillar D1=32 L=180

Please state:
EPO.032.180

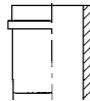
To be used with



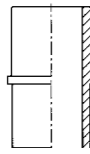
Type 3 ball bearing cage
Type PA



Straight sleeve bush for ball bearing cage
Type GB

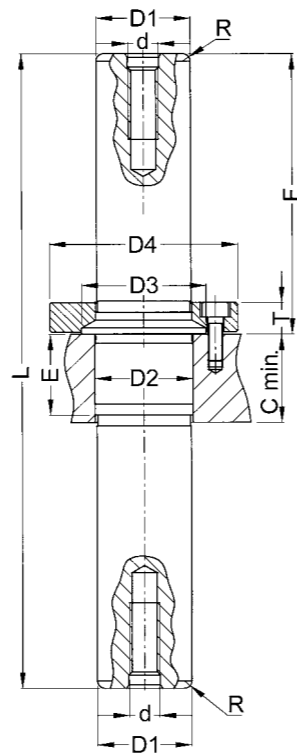
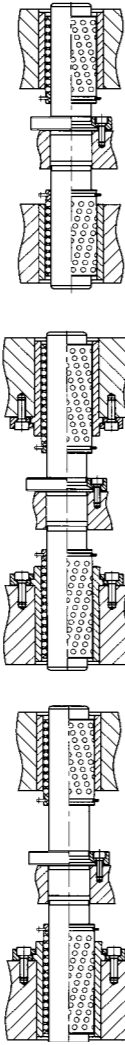


Short demountable bush for ball bearing cage
Type NB or HB

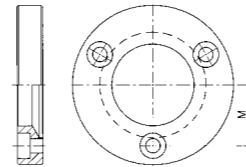


Demountable bush for ball bearing cage
Type JB

Examples



Supplied with



D1		20	25	32	40
L	F	REFERENCES			
160	70	EPO.020.160			
180	80	EPO.020.180	EPO.025.180	EPO.032.180	
200	90	EPO.020.200	EPO.025.200	EPO.032.200	EPO.040.200
220	100		EPO.025.220	EPO.032.220	EPO.040.220
240	110			EPO.032.240	
250					EPO.040.250
D2		22	26	32,5	42
D3		27	33	40	49
D4		44	50	62	71
E		20	22	25	27
d		M8			
R		1,5	2,0		2,5
M		16	19	24	28
C mini.		22	24	27	29
T		9		10	11
Clamp		P04.020.000	P04.025.000	P04.032.000	P04.040.000
Screw		A05.004.012 (M4x12)		A05.005.012 (M5x12)	A05.006.012 (M6x12)
Quantity		3			



Products available upon request:
- Different lengths L and F
- Hollow pillars

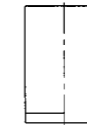
Ordering example
Pillar D1=25 L=220

Please state:
CMF.025.220

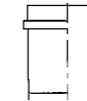
To be used with



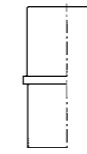
Type 3 ball bearing cage
Type PA



Straight sleeve bush for ball bearing cage
Type GB

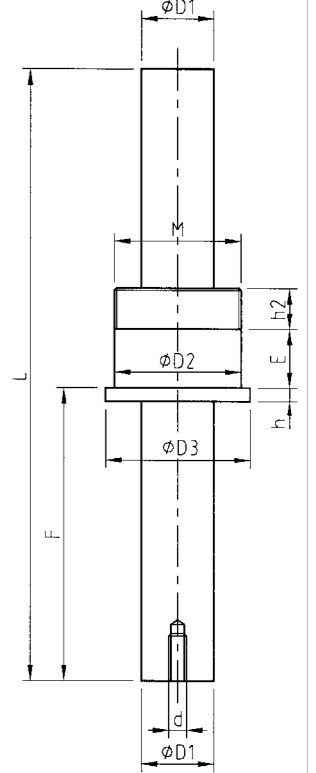
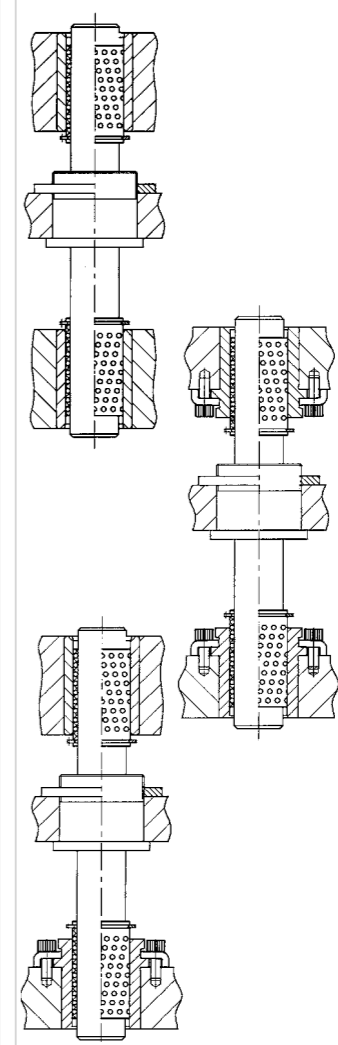


Short demountable bush for ball bearing cage
Type NB or HB

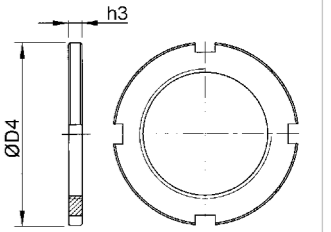


Demountable bush for ball bearing cage
Type JB

Examples



Supplied with



D1			16	20	25	32	40
L	F	E	REFERENCES				
135	65	13	CMF.016.135	CMF.020.135			
200	90	17		CMF.020.200			
165	74	22			CMF.025.165		
215	110	22			CMF.025.215		
220		27			CMF.025.220	CMF.032.220	CMF.040.220
240	112	35				CMF.032.240	CMF.040.240
D2			28	32	40	50	63
D3			32	36	45	56	70
d			M5	M6	M8		
h			3		4		
h2			9		11		
Nut			B04.016.000	B04.020.000	B04.025.000	B04.032.000	B04.040.000
M			27x100	30x100	39x100	48x100	60x100
h3			3	4		5	6
D4			40	44	55	65	81

RETAINING STOP

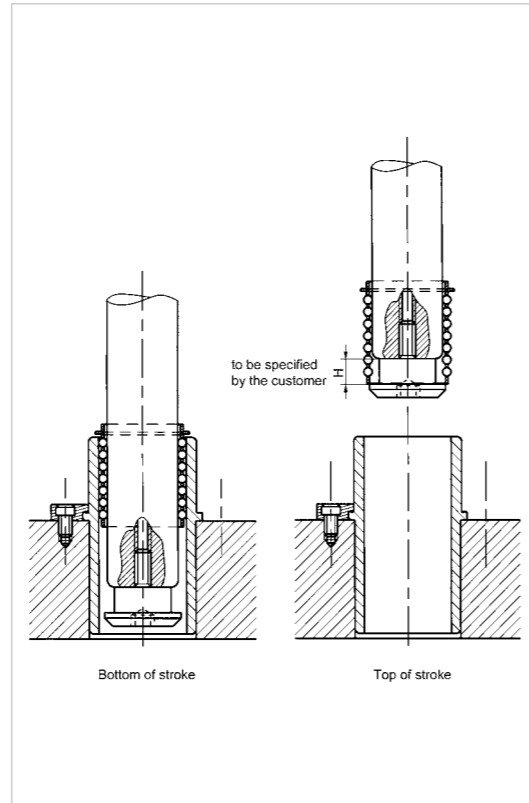
BAD



The retaining stop prevents the release of the ball bearing cage if the pillars pull out completely. The retainer can operate at a variable height H, for which the standards are set out in the table below.

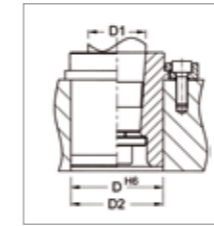
Height H is obtained by stacking the required number of spacers. Other heights can be obtained upon request.

Ordering example
Pillar D1=16 mm; height H=16 mm
Please state : **BAD.016.016**

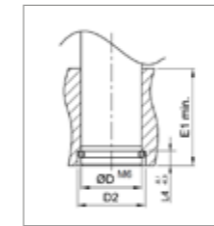


D1	12	16	20	25	32	40	50	63	80
Spacer height	8	8	10	10	10	10	15	15	20
H	REFERENCE								
8	BAD.012.008	BAD.016.008							
10			BAD.020.010	BAD.025.010	BAD.032.010	BAD.040.010			
15							BAD.050.015	BAD.063.015	BAD.080.015
16	BAD.012.016	BAD.016.016							
20			BAD.020.020	BAD.025.020	BAD.032.020	BAD.040.020			
24	BAD.012.024	BAD.016.024							
30			BAD.020.030	BAD.025.030	BAD.032.030	BAD.040.030	BAD.050.030		
32	BAD.012.032	BAD.016.032							
40			BAD.020.040	BAD.025.040	BAD.032.040	BAD.040.040			
45							BAD.050.045		
60							BAD.050.060		

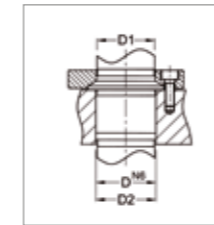
RECOMMENDED ASSEMBLY TOLERANCES



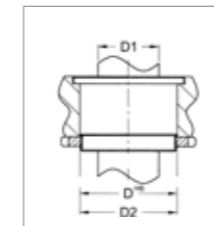
BUSH FOR TAPERED PILLAR, type EB										
D1	12	16	20	25	32	40	50	63	80	100
D2	22	28	32	40	50	63	80	90	110	140
D H6	22.000 22.013	28.000 28.013	32.000 32.016	40.000 40.016	50.000 50.016	63.000 63.019	80.000 80.019	90.000 90.022	110.000 110.022	140.000 140.025



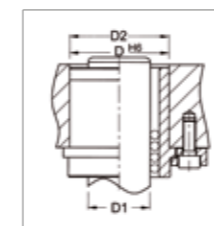
PILLAR WITH LOWER RETAINER, type BA										
D1	12	16	20	25	32	40	50	63	80	100
D2	14	18	23	28	37	45	55	70	87	107
L4	4	4	6	6	10	10	10	16	16	16
D H6	11.985 11.996	15.985 15.996	19.983 19.996	24.983 24.996	31.980 31.996	39.980 39.996	49.980 49.996	62.976 62.995	79.976 79.995	99.972 99.994



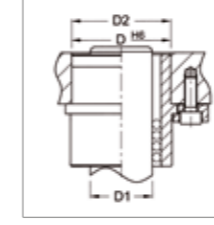
DEMOUNTABLE PILLAR WITH COLLAR, type EPO				
D1	20	25	32	40
D2	22	26	34	42
D H6	21.976 21.989	25.976 25.989	33.972 33.988	41.972 41.988



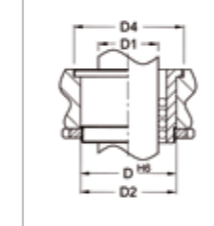
THREADED MIDDLE PILLAR, type CMF					
D1	16	20	25	32	40
D2	28	32	40	50	63
D H6	28.000 28.013	32.000 32.016	40.000 40.016	50.000 50.016	63.000 63.019



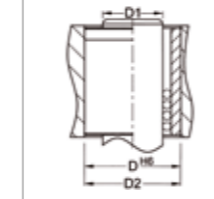
SHORT DEMOUNTABLE BUSH, type HB / DEMOUNTABLE BUSH, type JB										
D1	12	16	20	25	32	40	50	63	80	100
D2	22	28	32	40	50	63	80	90	110	140
D H6	22.000 22.013	28.000 28.013	32.000 32.016	40.000 40.016	50.000 50.016	63.000 63.019	80.000 80.019	90.000 90.022	110.000 110.022	140.000 140.025



INTERMEDIATE BUSH, type NB / SMOOTH BUSH, type GB							
D1	12	16	20	25	32	40	50
D2	22	28	32	40	50	63	80
D3 (bush NB)	26	33	37	46	57	71	91
D H6	22.000 22.013	28.000 28.013	32.000 32.016	40.000 40.016	50.000 50.016	63.000 63.019	80.000 80.019

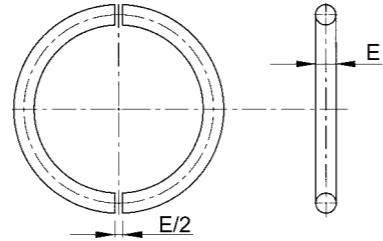
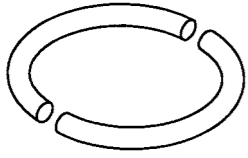


INTERMEDIATE BUSH, type NB / SMOOTH BUSH, type GB							
D1	12	16	20	25	32	40	50
D2	22	28	32	40	50	63	80
D3 (bush NB)	26	33	37	46	57	71	91
D H6	22.000 22.013	28.000 28.013	32.000 32.016	40.000 40.016	50.000 50.016	63.000 63.019	80.000 80.019



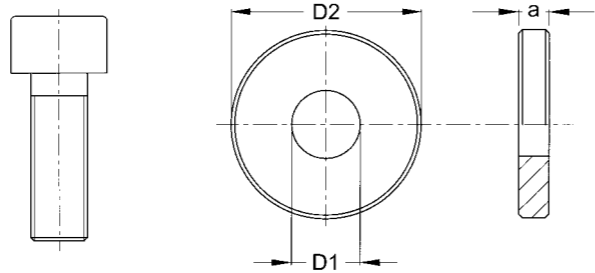
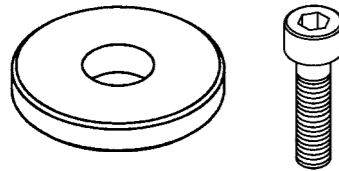
INTERMEDIATE BUSH, type NB / SMOOTH BUSH, type GB							
D1	12	16	20	25	32	40	50
D2	22	28	32	40	50	63	80
D3 (bush NB)	26	33	37	46	57	71	91
D H6	22.000 22.013	28.000 28.013	32.000 32.016	40.000 40.016	50.000 50.016	63.000 63.019	80.000 80.019

1/2 snap ring for cylindrical pillar with lower retainer.



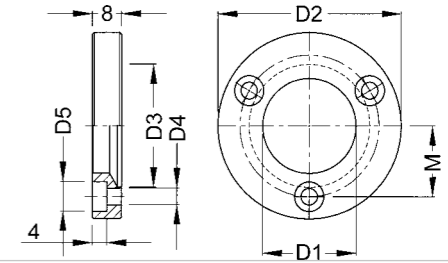
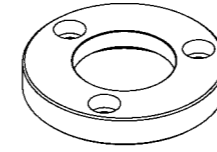
Ø Pillar	12	16	20	25	32
REFERENCE	P01.012.000	P01.016.000	P01.020.000	P01.025.000	P01.032.000
E	1,6		2,5		4,0
Ø Pillar	40	50	63	80	100
REFERENCE	P01.040.000	P01.050.000	P01.063.000	P01.080.000	P01.100.000
E	4,0			6,0	

Retaining washer for pillar with tapered fitting.



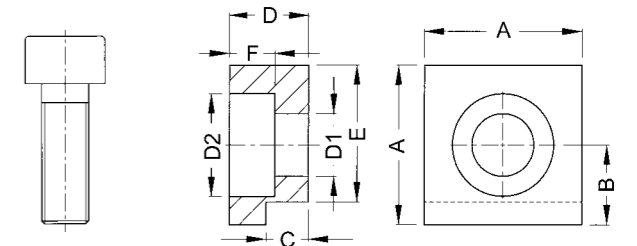
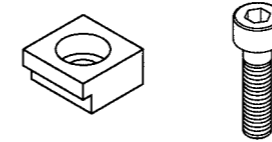
Ø Pillar	12	16	20	25	32
REFERENCE	P03.012.000	P03.016.000	P03.020.000	P03.025.000	P03.032.000
D1	5,5	6,6		9,0	
D2	14	18	22	25	32
a	2	3		4	
Screw	A05.005.012 (M5x12)	A05.006.012 (M6x12)		A05.008.016 (M8x16)	
Ø Pillar	40	50	63	80	100
REFERENCE	P03.040.000	P03.050.000	P03.063.000	P03.080.000	P03.100.000
D1	9	11	14	18	
D2	40	50	63	80	100
a	4	5	6	8	10
Screw	A05.008.016 (M8x16)	A05.010.020 (M10x20)	A05.012.020 (M12x20)	A05.016.035 (M16x35)	

Collar for demountable pillar, type EP0.xxx.xxx



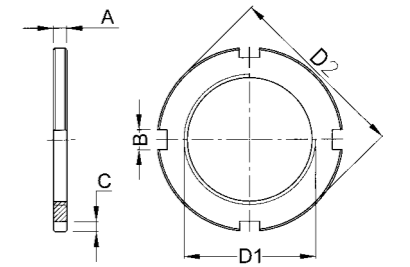
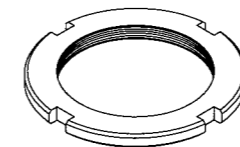
Ø Pillar	20	25	32	40
REFERENCE	P04.020.000	P04.025.000	P04.032.000	P04.040.000
D1	22	26	33	41
D2	44	50	62	71
D3	27	33	40	49
D4	4,5		5,5	6,6
D5	7,5		9	10,5
M	32	38	48	56
Clamp	A05.004.012 (M4x12)		A05.005.012 (M5x12)	A05.006.012 (M6x12)

Compact Retaining clamps for guide bush, type HB.xxx.xxx and JB.xxx.xxx, and bush for tapered shank, type EB.xxx.xxx.x.

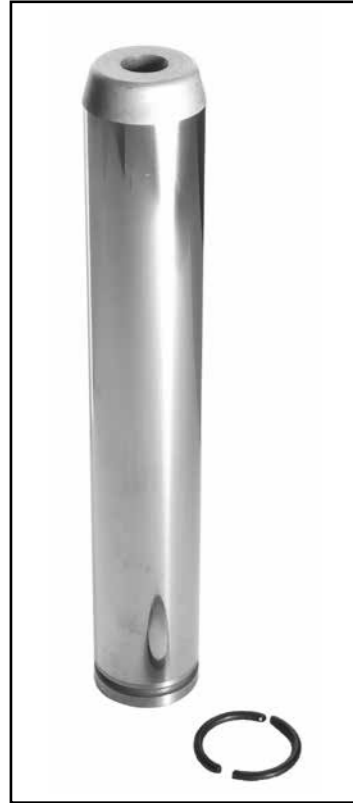


REFERENCE	B03.004.000	B03.005.000	B03.006.000	B03.008.000	B03.010.000
D1	4,5	5,5	6,6	9,0	11,0
D2	8	9	12	16	18
A	12	14	18	22	26
B	6,0	7,0	9,5	12,0	15,0
C	2,75	3,75	4,75	5,75	9,75
D	5	7	9	11	18
E	10,5	12,0	15,5	19,0	21,0
F	3	4	5	7	10
Screw	A05.004.012 (M4x12)	A05.005.012 (M5x12)	A05.006.012 (M6x12)	A05.008.016 (M8x16)	A05.010.025 (M10x25)

Slotted nut for intermediate bush, type NB.xxx.xxx, and for threaded middle pillar with retainer, type CMF.xxx.xxx.



Ø Pillar	12	16	20	25	32	40	50
REFERENCE	B04.012.000	B04.016.000	B04.020.000	B04.025.000	B04.032.000	B04.040.000	B04.050.000
D1	M22x1	M27x1	M30x1	M39x1	M48x1	M60x1	M76x1
D2	34	40	44	55	65	81	100
A	3		4		5	6	8
B	4	5		6		7	
C	2,5	3,0		3,5		4,0	



Manufactured according to **NF E 63-050**.

Material :

- 16 NC 6 Face-hardened steel
- Rockwell HRc > 60

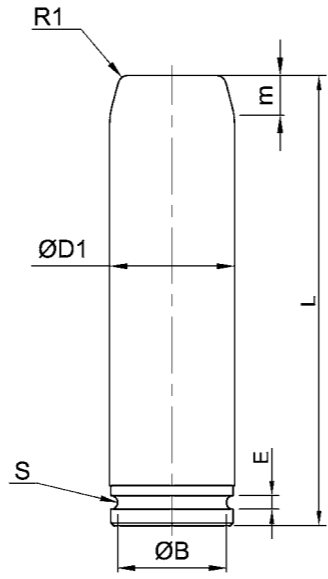
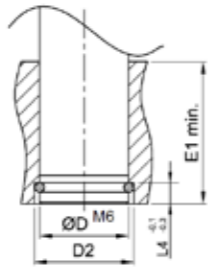
Tolerances :
For the bed-Plate we do recommend M6 boring out.

Nota :

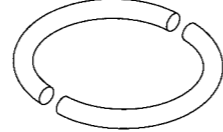
- MABEC code for some items.
- Other dimensions available upon request.

Example

Type = RI, D1 = 32mm, L = 180mm
Please state : **RI.032.180**



1/2 snap-ring delivered with pillard



D1	12	16	20	25	32	40	50	63	80	100
L	REFERENCES									
80	RI.012.080									
100	RI.012.100	RI.016.100	RI.020.100	RI.025.100						
125	RI.012.125	RI.016.140	RI.020.125	RI.025.125	RI.032.125					
140		RI.016.160	RI.020.140	RI.025.140	RI.032.140					
160		RI.016.180	RI.020.160	RI.025.160	RI.032.160	RI.040.160				
180			RI.020.180	RI.025.180	RI.032.180	RI.040.180				
200			RI.020.200	RI.025.200	RI.032.200	RI.040.200	RI.050.200			
224				RI.025.224	RI.032.224	RI.040.224	RI.050.224			
250					RI.032.250	RI.040.250	RI.050.250	RI.063.250		
280						RI.040.280	RI.050.280	RI.063.280		
315							RI.050.315	RI.063.315	RI.080.315	
355									RI.080.355	
400							RI.050.400*		RI.080.400	
450										RI.100.450
B	10,3	14,3	17,3	22,3	27,8	35,8	45,8	56,8	73,8	93,8
m	4	5	6	8	10	12	16	16	16	16
E1	1,7	1,7	2,7	2,7	4,2	4,2	4,2	6,5	6,2	6,2
R1	2	2	2	2	2	3	3	5	5	5
S	0,85	0,85	1,35	1,35	2,1	2,1	2,1	3,1	3,1	3,1
E1 min	20	25	32	40	50	63	80	100	125	160
L4	4	4	6	6	10	10	10	16	16	16
D	12	16	20	25	32	40	50	63	80	100
D2	14	18	23	28	37	45	55	74	87	107
Ref. 1/2 snap-rings	P01.012.000	P01.016.000	P01.020.000	P01.025.000	P01.032.000	P01.040.000	P01.050.000	P01.063.000	P01.080.000	P01.100.000

RI.xxx.xxx* : référence disponible sur demande



Manufactured according to **NF E 63-050**.

Material :

- 16 NC 6 Face-hardened steel
- Rockwell HRc > 60

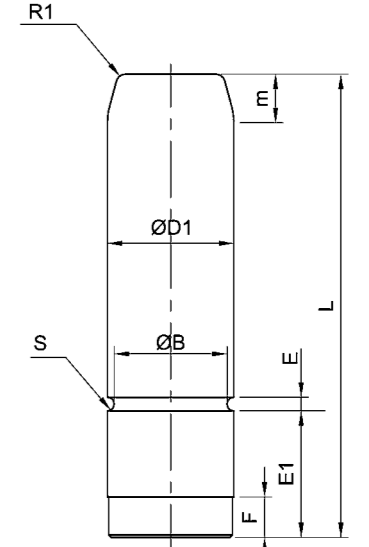
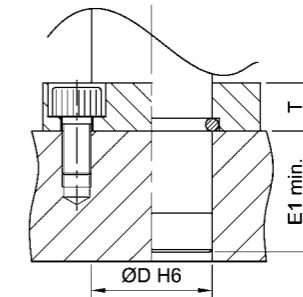
Tolerances :
Dimensions without tolerance indication = +/- 0.5. For the bed-plate, we do recommend an H6 boring out.

Nota :

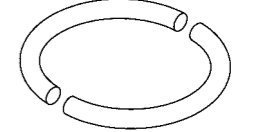
- MABEC code for some items

Ordering example

Type = RM, D1 = 50mm, L = 224mm
Please state : **RM.050.224**



1/2 snap-ring delivered with pillard BC.xxx



D1	25	32	40	50	63	80	100
L	REFERENCES						
100	RM.025.100						
125	RM.025.125	RM.032.125					
140	RM.025.140	RM.032.140					
160	RM.025.160	RM.032.160	RM.040.160				
180	RM.025.180	RM.032.180	RM.040.180				
200	RM.025.200	RM.032.200	RM.040.200	RM.050.200			
224	RM.025.224	RM.032.224	RM.040.224	RM.050.224			
250		RM.032.250	RM.040.250	RM.050.250	RM.063.250		
280				RM.050.280	RM.063.280		
315				RM.050.315	RM.063.315	RM.080.315	
355				RM.050.355	RM.063.355	RM.080.355	RM.100.355
400				RM.050.400		RM.080.400	RM.100.400
450							RM.100.450
B	22,3	27,8	35,8	45,8	56,8	73,8	93,8
m	8	10	12	16	16	16	16
E1	25	32	63	80	100	125	160
E	2,7	4,2	4,2	4,2	6,2	6,2	6,2
F	8	12	12	12	18	18	18
R1	2	2	3	3	5	5	5
S	1,35	2,1	2,1	2,1	3,1	3,1	3,1
T	10	10	12	14	18	20	20
E1 min	25	32	63	80	100	125	160
D	25	32	40	50	63	80	100
Ref. 1/2 snap-rings	P01.025.000	P01.032.000	P01.040.000	P01.050.000	P01.063.000	P01.080.000	P01.100.000



Manufactured according to **NF E 63-050**.

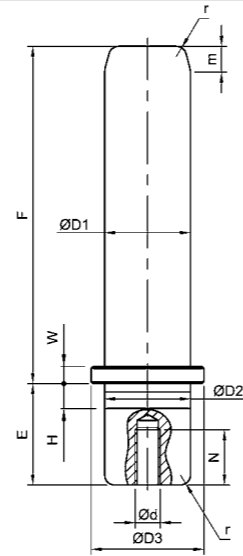
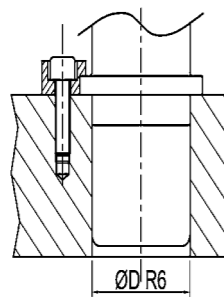
- Material : Steel**
- Rockwell HRC > 60 hardness
 - R > 1070 N/mm² resistance to substratum traction

Tolerances :
Dimensions without tolerance indication = +/- 0.5

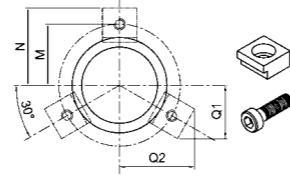
- Nota :**
- Pillars can be used with our anodised bushings, steel or bronze, as well as in semi-blocks.

Ordering example

Type = RID, D1 = 32mm, L=180mm
Please state : **RID.032.180**



3 retaining blocs delivered with the pillar



D1	20	25	32	40	50	63
F	REFERENCES					
80	RID.020.080	RID.025.080				
100	RID.020.100	RID.025.100	RID.032.100			
112	RID.020.112	RID.025.112	RID.032.112	RID.040.112		
125	RID.020.125	RID.025.125	RID.032.125	RID.040.125	RID.050.125	
140	RID.020.140	RID.025.140	RID.032.140	RID.040.140	RID.050.140	RID.063.140
160	RID.020.160	RID.025.160	RID.032.160	RID.040.160	RID.050.160	RID.063.160
180		RID.025.180	RID.032.180	RID.040.180	RID.050.180	RID.063.180
200			RID.032.200	RID.040.200	RID.050.200	RID.063.200
224			RID.032.224	RID.040.224	RID.050.224	RID.063.224
250			RID.032.250	RID.040.250	RID.050.250	RID.063.250
280			RID.032.280	RID.040.280	RID.050.280	RID.063.280
315				RID.040.315	RID.050.315	RID.063.315
355					RID.050.355	RID.063.355
400						RID.063.400
D2 = E	20	25	32	40	50	63
D3	26	32	40	50	63	76
m	6	8	10	12	16	16
W	4	4	5	5	6	10
H	4	5	6	8	10	12
ØdxN	M8 x 20	M8 x 20	M8 x 20	M8 x 20	M10 x 25	M10 x 25
Clamps	B03.005.000	B03.005.000	B03.006.000	B03.006.000	B03.008.000	B03.010.000
Screw	A05.005.012	A05.005.012	A05.006.016	A05.006.016	A05.008.020	A05.010.025
M/N	18/25	21/28	27/35,5	32/40,5	40,5/50,5	48/59
Q1/Q2	18,6/25,2	20,1/27,7	25,5/35,2	28/39,6	34,8/49,2	40,8/57,6

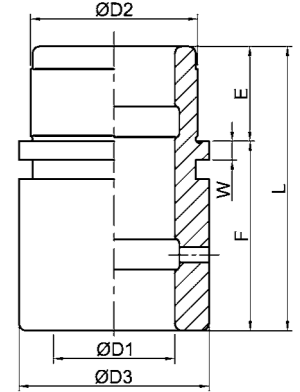
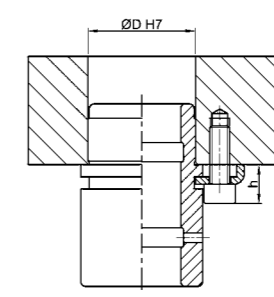


«Bronze» guide bush characteristics

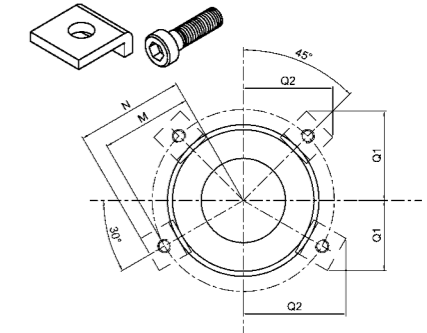
- Interior spider legs
- Finely ground
- Assembled on bed-plate with retaining blocks and screws
- Bushings interchangeability
- Hardness : > 170 HB
- Bed-plate boring out tolerance : H7
- Built-in lubricator

Ordering example

Type = BRO, D1 = 32mm, L=46mm
Please state : **BRO.032.046**



Delivered with clamps and screws



D1	20	25	32	40	50	63	80
L	REFERENCES						
34	16						
50	32						
43	21		BRO.025.043				
66	44		BRO.025.066				
46	21			BRO.032.046			
75	50			BRO.032.075			
56	21				BRO.040.056		
85	50				BRO.040.085		
70	25					BRO.050.070	
95	50					BRO.050.095	
70	25						BRO.063.070
108	63						BRO.063.108
D2		28	35	44	52	63	80
D3		32	43	50	59	75	91
W		4	4	5	5	5	5
Clamps		B03.006.100	B03.006.100	B03.008.100	B03.008.100	B03.008.100	B03.008.100
Clamps qty		2	2	3	3	4	4
Screws		A05.006.016	A05.006.016	A05.008.020	A05.008.020	A05.008.020	A05.008.020
h		12	12	15,5	15,5	15,5	15,5
M		21,5	27	32	36,5	44,5	52,5
N		28	33,5	42	46,5	54,5	62,5
Clamps at 30°	Q1	21,2	23,9	28,8	31	35	39
	Q2	28,7	33,4	40,9	44,8	51,7	58,6
Clamps at 45°	Q1 = Q2	25,8	29,7	36,1	39,2	44,9	50,6

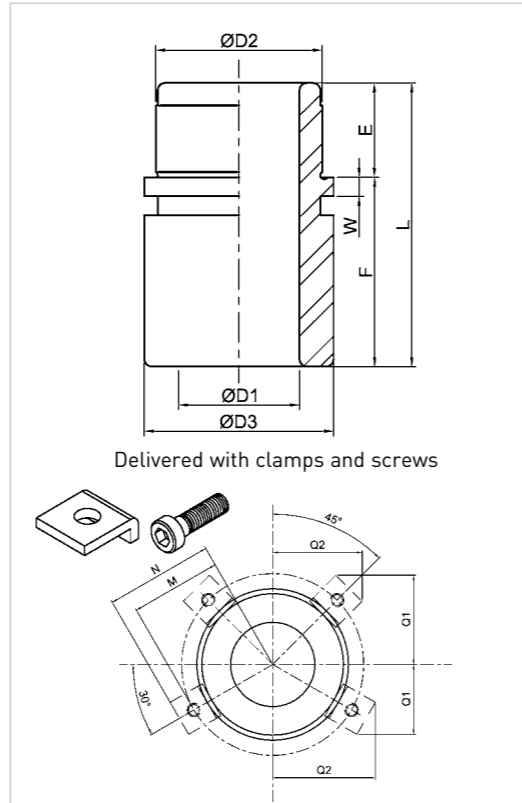
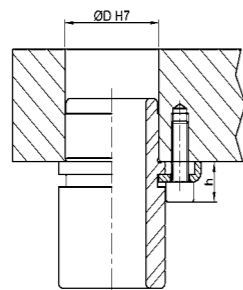
«ALUANODISED» GUIDE BUSH WITH COLLAR ALU



- “ALUANODISED” Guide Bush Characteristics**
- Great resistance to wear and tear
 - Self-lubricating (lubricating when fitting is enough : use light oil)
 - Non corrosive
 - Non magnetic
 - Assembled on bed-plate with clamps and screws
 - Bushing interchangeable
 - Hardness : 70/71 Hrc
 - Bed-plate boring out tolerance : H7

Example

Type = ALU, D1 = 40mm, L=85mm
Please state : **ALU.040.085**



D1			20	25	32	40	50	63	80
L	F	E	REFERENCES						
34	16	18	ALU.020.034						
50	32		ALU.020.050						
43	21	22		ALU.025.043					
66	44		BALU.025.066						
46	21	25			ALU.032.046				
75	50		ALU.032.075						
56	21	35				ALU.040.056			
85	50		ALU.040.085						
70	25	45					ALU.050.070		
95	50		ALU.050.095						
70	25	45						ALU.063.070	ALU.080.070
108	63		ALU.063.108						ALU.080.108
D2			28	35	44	52	63	80	100
D3			32	43	50	59	75	91	110
W			4	4	5	5	5	5	5
Clamp			B03.006.100	B03.006.100	B03.008.100	B03.008.100	B03.008.100	B03.008.100	B03.008.100
Clamp qty			2	2	3	3	4	4	4
Screw			A05.006.016	A05.006.016	A05.008.020	A05.008.020	A05.008.020	A05.008.020	A05.008.020
h			12	12	15,5	15,5	15,5	15,5	15,5
M			21,5	27	32	36,5	44,5	52,5	64
N			28	33,5	42	46,5	54,5	62,5	72
Clamps at 30°	Q1	21,2	23,9	28,8	31	35	39	43,9	
	Q2	28,7	33,4	40,9	44,8	51,7	58,6	66,9	
Clamps at 45°	Q1 = Q2	25,8	29,7	36,1	39,2	44,9	50,6	57,3	

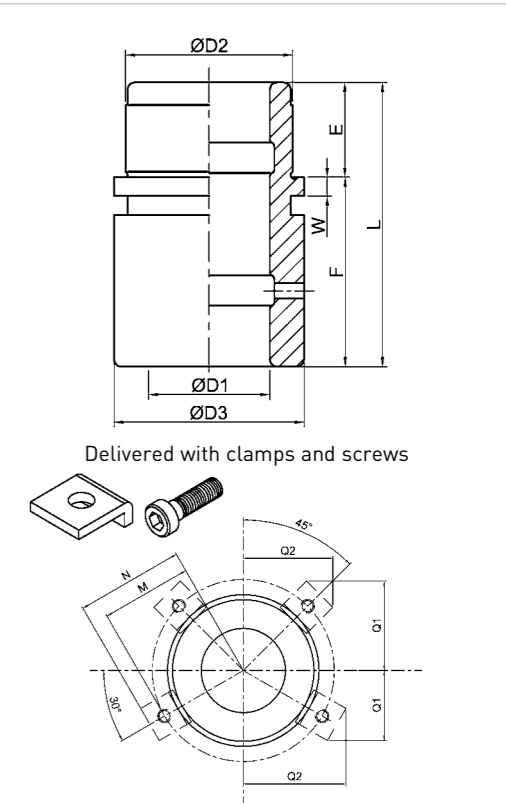
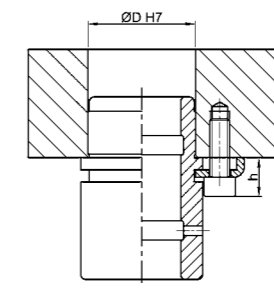
STEEL GUIDE BUSH WITH COLLAR ACI



- Steel Guide Bush with collar**
- Interior spider legs
 - Finely ground
 - Assembled on bed-plate with retaining blocks and screws
 - Collars interchangeability
 - Hardness : 61/63 Hrc on the surface
 - Bed-plate boring out tolerance : H7
 - Built-in lubricator

Example

Type = ACI, D1 = 50mm, L=70mm
Please state : **ACI.050.070**



D1			20	25	32	40	50	63	80
L	F	E	REFERENCES						
34	16	18	ACI.020.034						
50	32		ACI.020.050						
43	21	22		ACI.025.043					
66	44		ACI.025.066						
46	21	25			ACI.032.046				
75	50		ACI.032.075						
56	21	35				ACI.040.056			
85	50		ACI.040.085						
70	25	45					ACI.050.070		
95	50		ACI.050.095						
70	25	45						ACI.063.070	ACI.080.070
108	63		ACI.063.108						ACI.080.108
D2			28	35	44	52	63	80	100
D3			32	43	50	59	75	91	110
W			4	4	5	5	5	5	5
Clamp			B03.006.100	B03.006.100	B03.008.100	B03.008.100	B03.008.100	B03.008.100	B03.008.100
Clamp qty			2	2	3	3	4	4	4
Screw			A05.006.016	A05.006.016	A05.008.020	A05.008.020	A05.008.020	A05.008.020	A05.008.020
h			12	12	15,5	15,5	15,5	15,5	15,5
M			21,5	27	32	36,5	44,5	52,5	64
N			28	33,5	42	46,5	54,5	62,5	72
Clamps at 30°	Q1	21,2	23,9	28,8	31	35	39	43,9	
	Q2	28,7	33,4	40,9	44,8	51,7	58,6	66,9	
Clamps at 45°	Q1 = Q2	25,8	29,7	36,1	39,2	44,9	50,6	57,3	



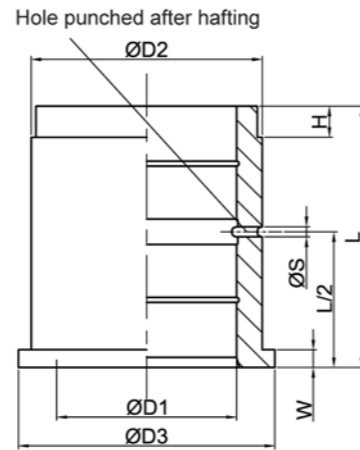
Manufactured according to **AFNOR E 63-054**

Material :
• Bronze

Boring out tolerance :
For bed plate we do recommend H7 boring out

Nota :
• MABEC code for some items.
• Clamping elements should be ordered separately in our AFNOR catalog

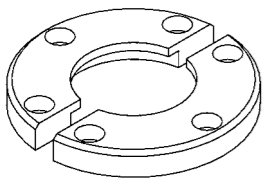
Example
Type = BCA, D1 = 50mm, L=80mm
Please state : **BCA.050.080**



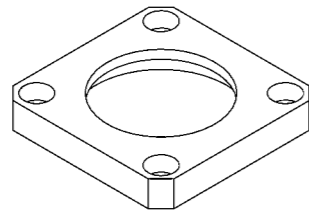
To be mounted with BDR.xxx, BRCB.xxx or B05.xxx.xxx below **(delivered separately)**

D1	12	16	20	25	32	40	50	63	80	100
REF.	BCA.012.020	BCA.016.025	BCA.020.032	BCA.025.040	BCA.032.050	BCA.040.063	BCA.050.080	BCA.063.100	BCA.080.125	BCA.100.160
D2	18	22	28	35	44	52	63	80	100	125
D3	22	25	32	40	50	60	71	90	112	140
W	2,5	3	4	5	6	8	10	12	16	20
H	2	2,5	3	5	8	8	8	10	10	10
L	20	25	32	40	50	63	80	100	125	160
ØS	4	4	4	4	4	7	7	7	7	7

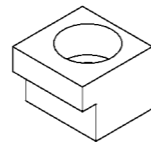
1/2 round retaining clamp
Reference BDR.xxx



Square retaining clamp
Reference BRCB.xxx



Compact retaining clamp
Reference B05.xxx.xxx

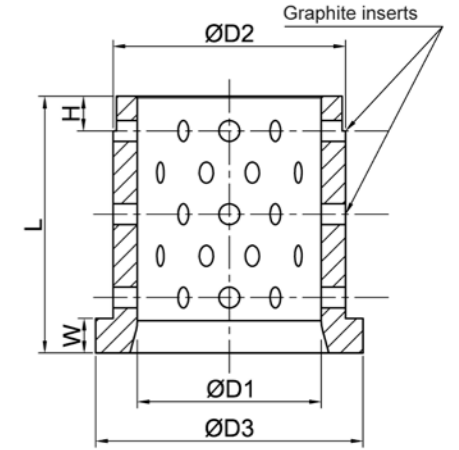


Material :
Bronze with impregnated friction graphite inserts

Boring out tolerance :
For bed plate we do recommend H7 boring out

Nota :
• MABEC code for some items.
• Clamping elements should be ordered separately in our AFNOR catalog

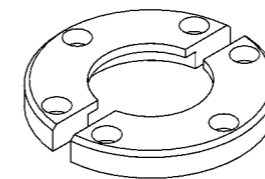
Example
Type = BBEI, D1 = 50mm
Please state : **BBEI.050**



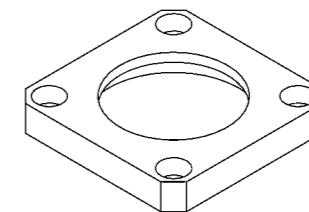
To be mounted with BDR.xxx, BRCB.xxx or B05.xxx.xxx below **(delivered separately)**

D1 ⁶⁷	20	25	32	40	50	63	80	100
RÉFÉRENCES	BBEI.020	BBEI.025	BBEI.032	BBEI.040	BBEI.050	BBEI.063	BBEI.080	BBEI.100
L	32	40	50	63	80	100	125	160
D2	28	35	44	52	63	80	100	125
D3	32	40	50	60	71	90	112	140
W	4	5	6	8	10	12	16	20

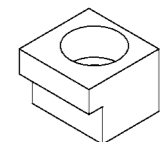
1/2 round retaining clamp
Reference BDR.xxx

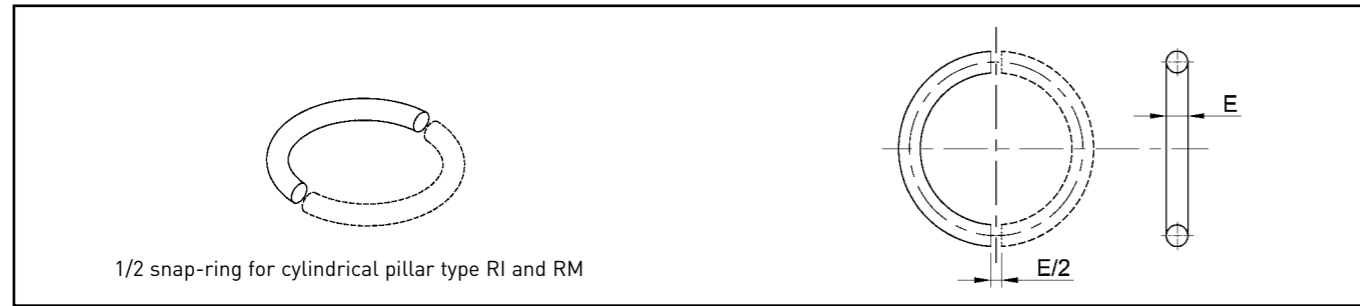


Square retaining clamp
Reference BRCB.xxx



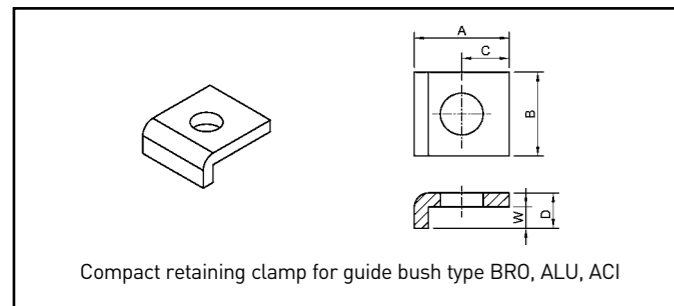
Compact retaining clamp
Reference B05.xxx.xxx





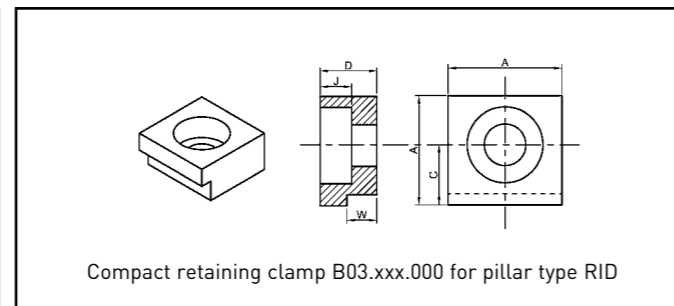
1/2 snap-ring for cylindrical pillar type RI and RM

Ø Pillar	12	16	20	25	32
REFERENCES 1/2 SNAP-RING	P01.012.000	P01.016.000	P01.020.000	P01.025.000	P01.032.000
E	1,6		2,5		4,0
Ø Pillar	40	50	63	80	100
RÉFÉRENCES 1/2 SNAP-RING	P01.040.000	P01.050.000	P01.063.000	P01.080.000	P01.100.000
E	14,0		6,0		



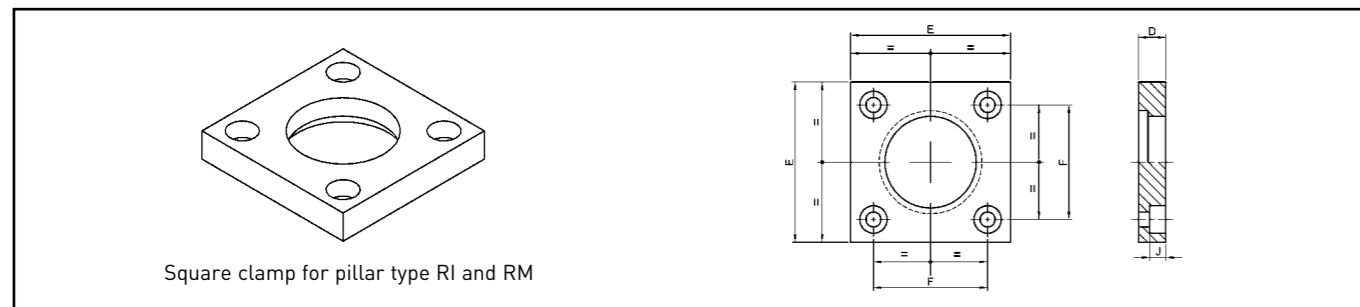
Compact retaining clamp for guide bush type BRO, ALU, ACI

REFERENCES	B03.006.100	B03.008.100
A	14,5	20
B	16	18
C	7,5	10
W	3	4,5
D	6	7,5
J	-	-
Screw	A05.006.016	A05.008.020



Compact retaining clamp B03.xxx.000 for pillar type RID

B03.005.000	B03.006.000	B03.008.000	B03.010.000
14	18	22	26
-	-	-	-
7	9,5	12	15
3,75	4,75	5,75	9,75
7	9	11	18
4	5	7	10
A05.005.012	A05.006.020	A05.008.020	A05.010.025



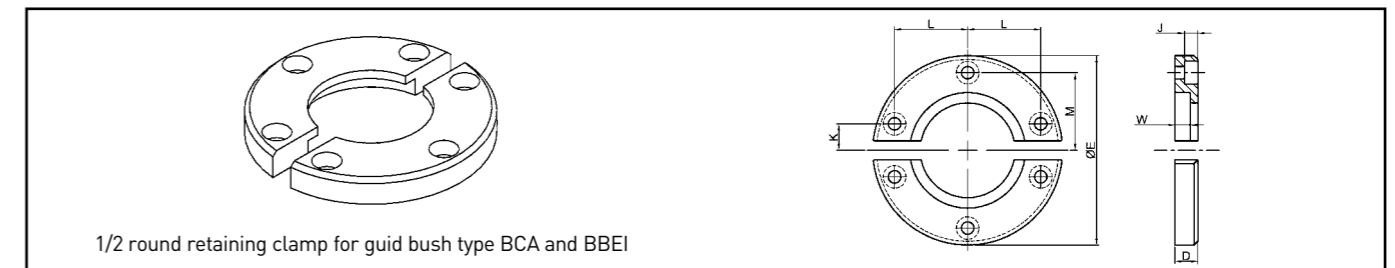
Square clamp for pillar type RI and RM

Ø Colonne	25	32	40	50	63	80	100
REFERENCES	BC.025	BC.032	BC.040	BC.050	BC.063	BC.080	BC.100
E	45	56	70	80	100	110	140
F	31	36	50	55	70	80	100
D	10	10	12	14	18	20	20
J	7	7	7	9	11	13	13
Screw	A05.005.012	A05.005.012	A05.005.012	A05.008.020	A05.010.025	A05.012.030	A05.012.030



Compact retaining clamp for guide bush type BCA and BBEI

Ø Guide bush	12	16	20	25	32
REFERENCES	B05.005.012	B05.008.016	B05.010.020	B05.010.025	B05.010.032
A	18	22	26	26	26
C	9,5	12	15	15	15
W	8	10	12	16	20
D	12	16	20	25	32
J	5	8	10	10	10
Screw	A05.005.016	A05.008.020	A05.010.025	A05.010.030	A05.010.035



1/2 round retaining clamp for guid bush type BCA and BBEI

Ø Guide bush	20	25	32	40	50	63	80	100
REFERENCES	BDR.020	BDR.025	BDR.032	BDR.040	BDR.050	BDR.063	BDR.080	BDR.100
ØE	63	72	80	100	125	140	180	200
D	10	10	12	12	16	20	25	32
W	4	5	6	8	10	12	16	20
J	7	7	7	7	9	11	13	13
M	-	-	-	41	49	57,5	72	85
K	18	20	21	14	17	17	20	25
L	16	20	25	38,5	46	55	70	81
Screw	A05.005.012	A05.005.012	A05.005.012	A05.005.012	A05.008.025	A05.010.030	A05.012.040	A05.012.060
Quantity	4	4	4	6	6	6	6	6



Square clamp for pillar type BCA and BBEI

Ø Bague	40	50	63	80
REFERENCES	BRCB.040	BRCB.050	BRCB.063	BRCB.080
E	75	85	100	120
F	58	65	80	98
D	12	16	16	20
J	7	9	9	12
W	8	10	12	16
Screw	A05.006.016	A05.008.020	A05.008.020	A05.008.020

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