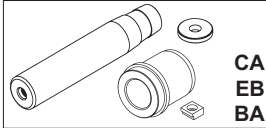
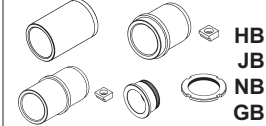
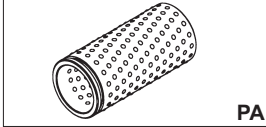
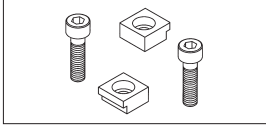
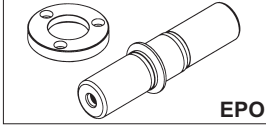
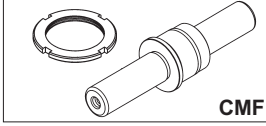
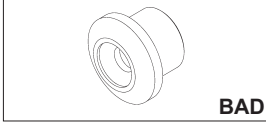
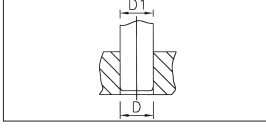
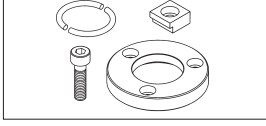


	Pages	
General information	32.02	
Ordering example:	32.04	
Guide pillar	32.05	
Guide bush	32.06	
Ball bearing cage	32.07	
Strokes	32.08	
Clamp positions	32.09	
Demountable pillar	32.10	
Middle pillar	32.11	
Retaining bush	32.12	
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Accessories	32.14 - 32.15	

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.

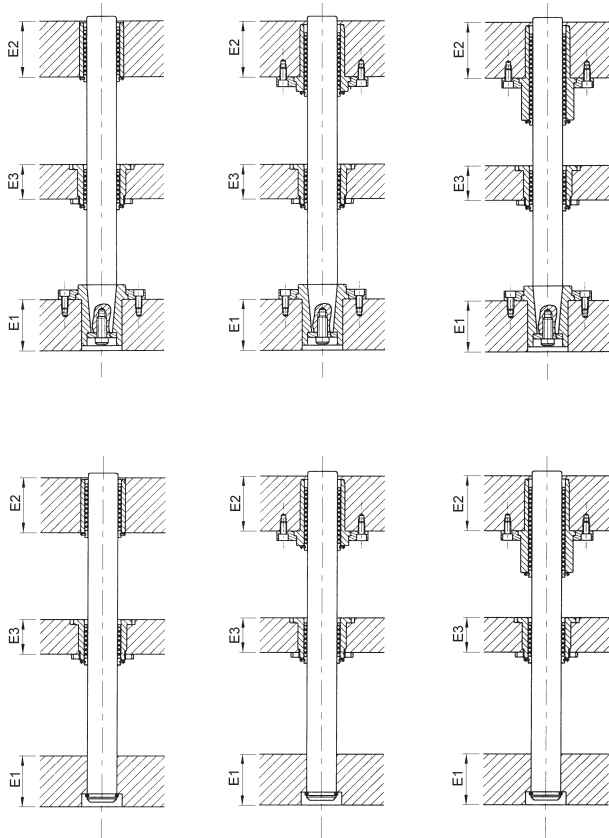
We keep large stocks for immediate deliveries.

APPLICATIONS:

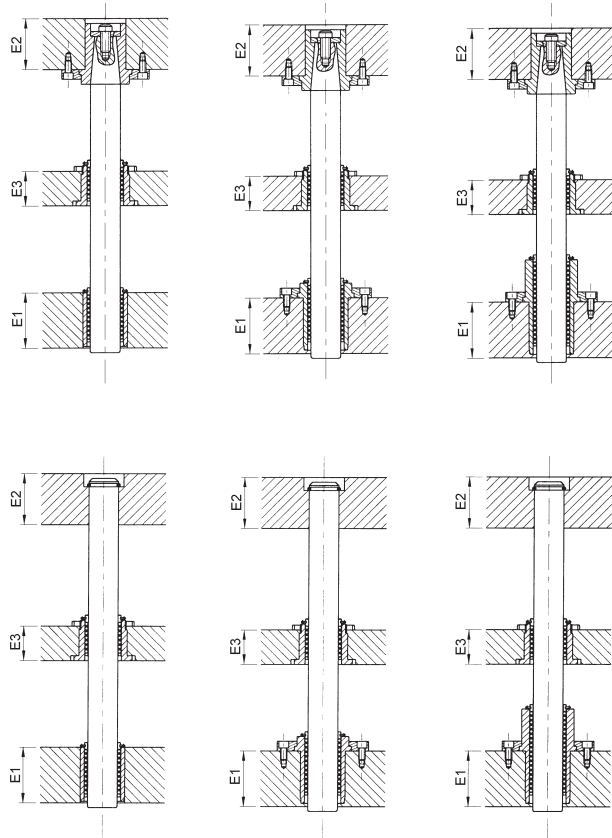
Originally designed for die sets, the "GUIDABILLE" is also used in numerous applications in all industries:

- 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:

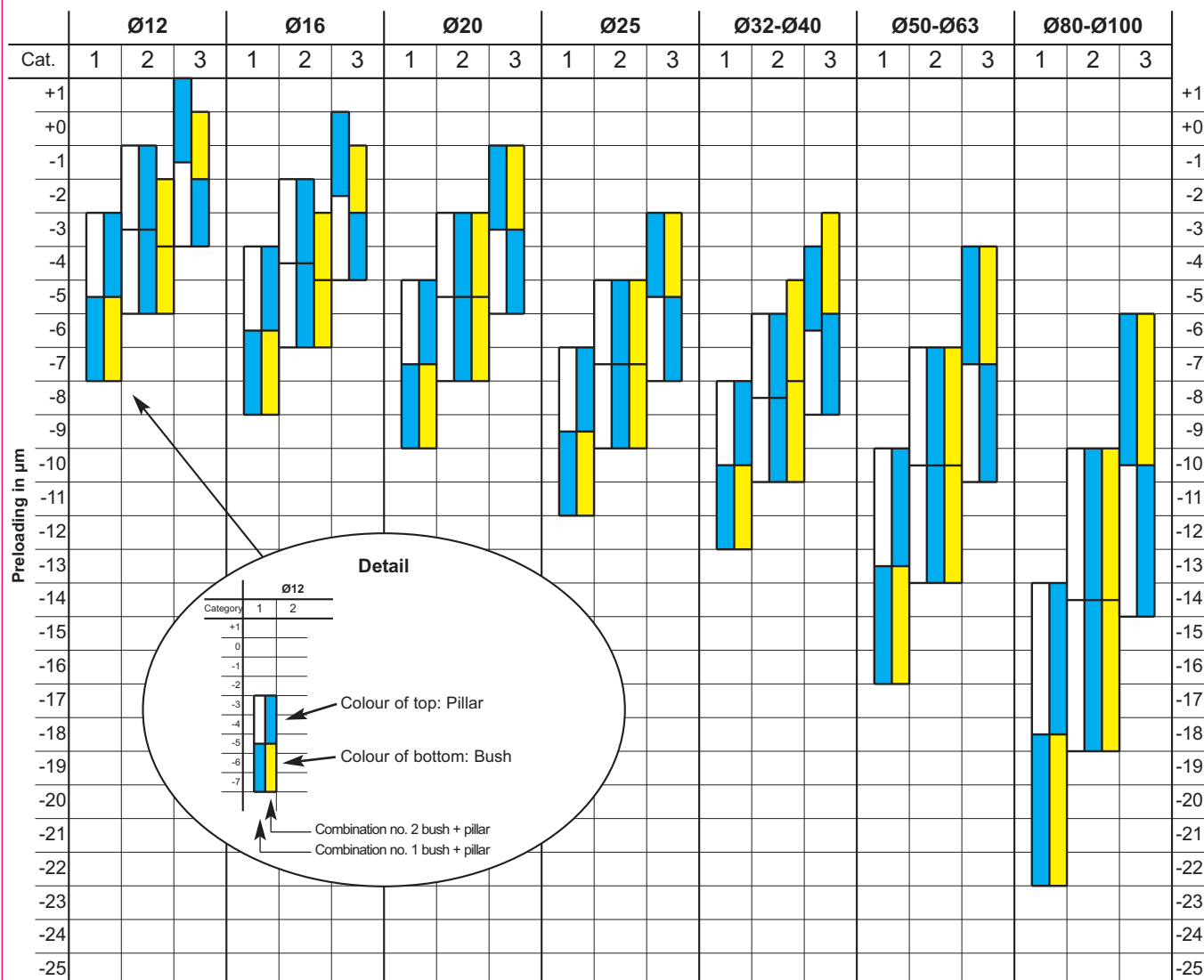
By matching bushes and pillars, we can offer you three adjustment categories:

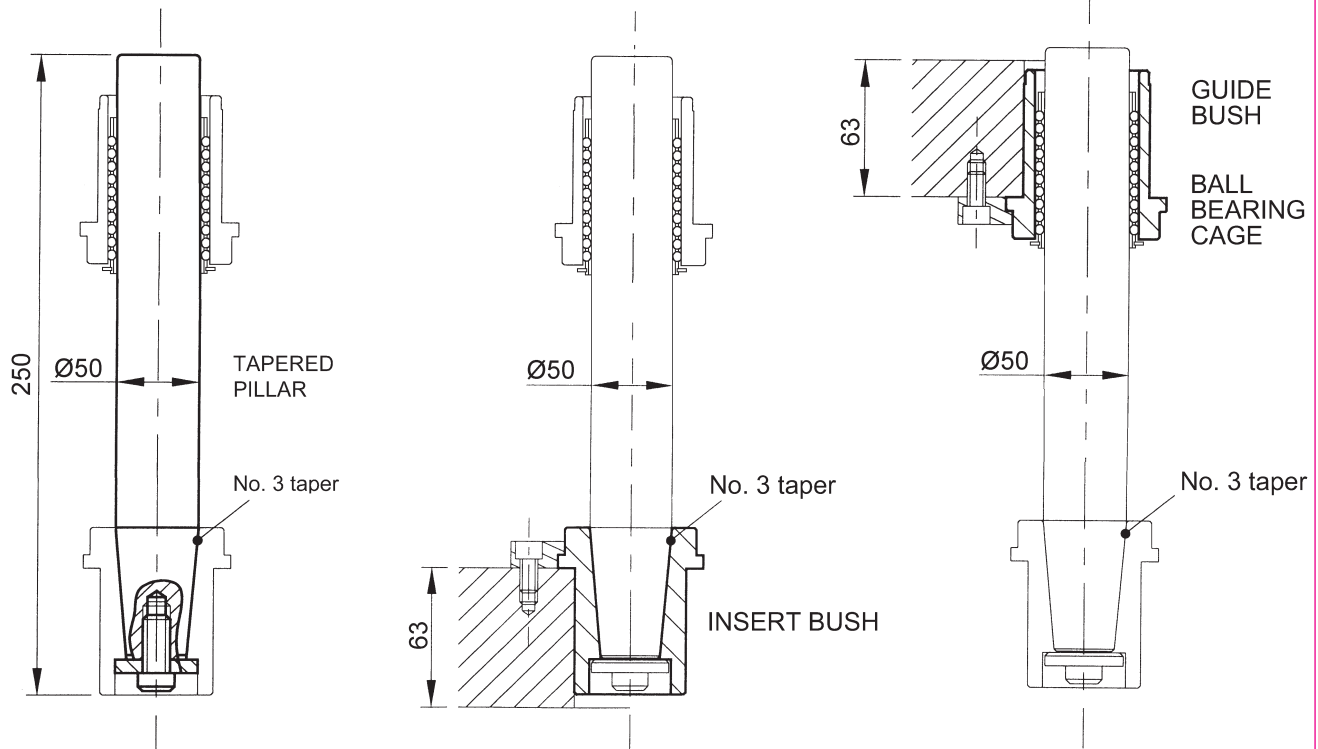
- CATEGORY 1:** For the cutting of very fine sheet metal.
For clearance between punch and die of less than 0.02 mm per side.
- CATEGORY 2:** For the cutting of sheet metal more than 0.4 mm thick
For clearance between punch and die of 0.02 to 0.06 mm per side.
For most applications.
- CATEGORY 3:** For 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 I is between -3 and -7 µm. Category I 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.





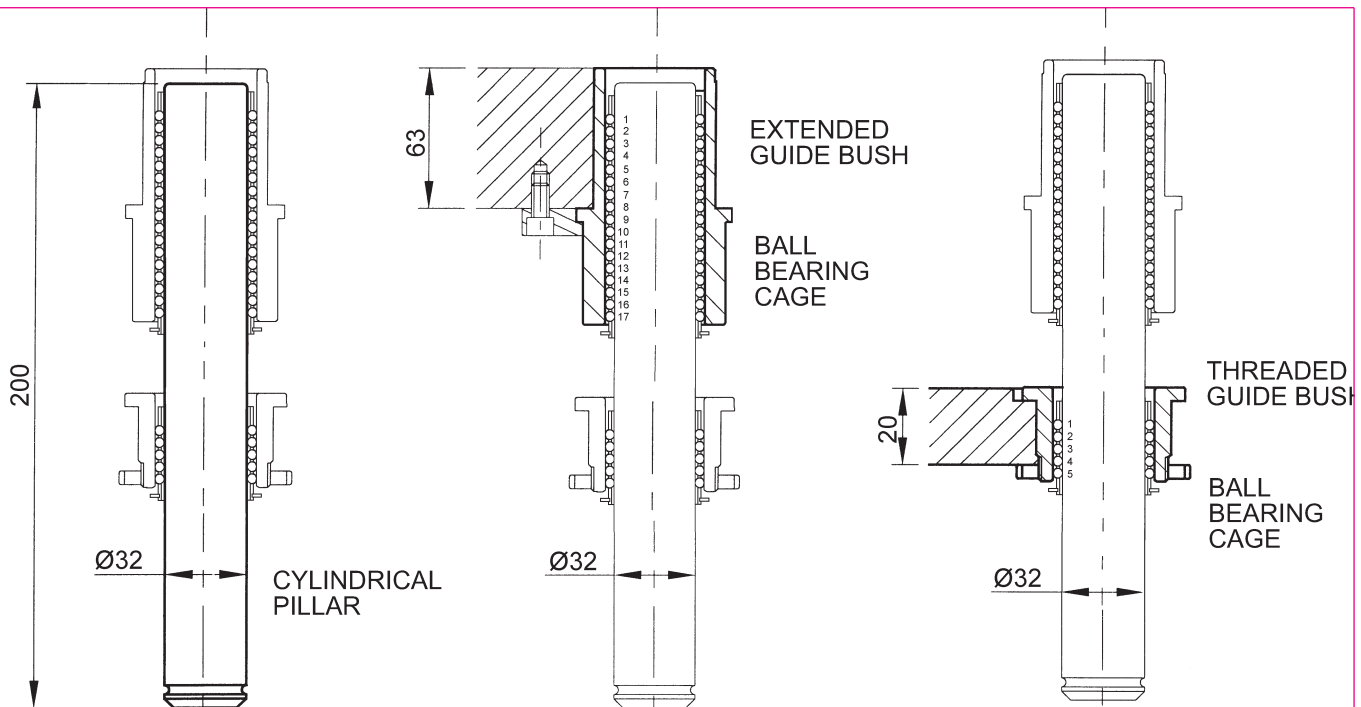
Ref. **CA.050.250.3**

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)



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:

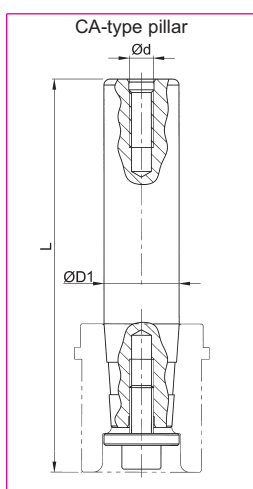
Some of these parts have MABEC codes.

Key for CA-type pillars:

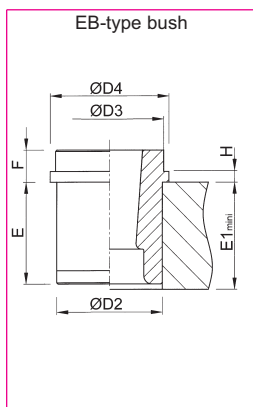
On request

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

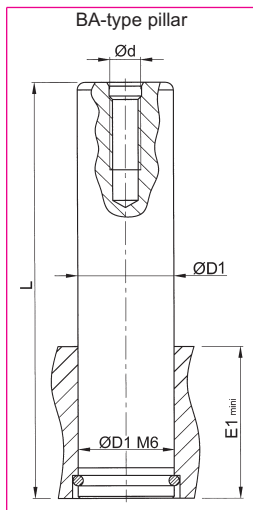
Available in taper 2 (x=2) and 3 (x=3)



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	REFERENCE									
25	EB.012.025.1									
32		EB.016.032.1								
40			EB.020.040.1	EB.025.040.2						
50				EB.025.050.1	EB.032.050.2	EB.040.050.3				
63					EB.032.063.1	EB.040.063.2	EB.050.063.3			
80							EB.050.080.2	EB.063.080.3		
100								EB.063.100.2	EB.080.100.3	
125										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	20	25	32	40	50	63	80	100	125	160
Ød	M5	M6	M8	M8	M8	M8	M10	M10	M12	M12



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

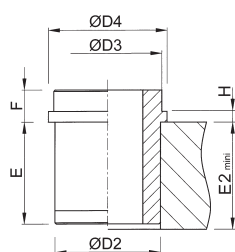
TO DETERMINE THE CORRECT "GUIDABILLE"

- 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 accommodate your bush and read off horizontally towards the right where you will automatically find the ball bearing cage PA.

Legend  On request

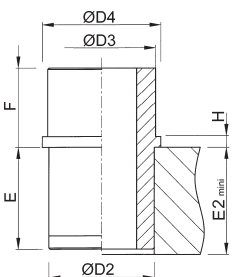
ØD1	12	16	20	25	32	40	50	63	80	100
ØD2	22	28	32	40	50	63	80	90	110	140
ØD3	-	-	-	-	-	-	-	100	125	150
ØD4	25	32	36	45	56	70	90	110	135	160
H	3	3	4	4	5	5	6	10	10	10

EB-type bush



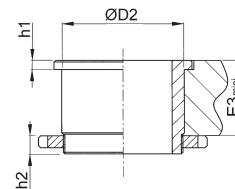
ØD1	12	16	20	25	32	40	50	63	80	100
E2	E	REFERENCE								
25	23	HB.012.025	HB.016.025	HB.020.025						
32	30	HB.012.032	HB.016.032	HB.020.032	HB.025.032					
40	38	HB.012.040	HB.016.040	HB.020.040	HB.025.040	HB.032.040				
50	48		HB.016.050	HB.020.050	HB.025.050	HB.032.050	HB.040.050			
63	61			HB.020.063	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

JB-type bush



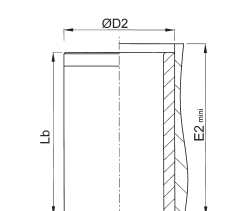
ØD1	12	16	20	25	32	40	50	63	80	100
E2	E	REFERENCE								
25	23	JB.012.025	JB.016.025							
32	30	JB.012.032	JB.016.032	JB.020.032	JB.025.032	JB.032.032				
40	38		JB.016.040	JB.020.040	JB.025.040	JB.032.040	JB.040.040	JB.050.040		
50	48			JB.020.050	JB.025.050	JB.032.050	JB.040.050	JB.050.050		
63	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
200	198									JB.100.160
F		25	32	36	40	45	50	63	63	70

NB-type bush



ØD1	12	16	20	25	32	40	50	63	80	100
E3	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



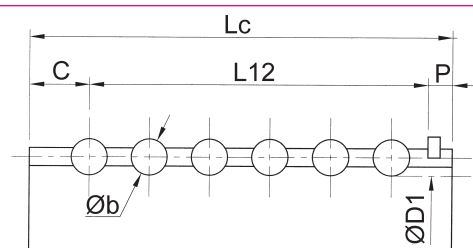
ØD1	12	16	20	25	32	40	50	63	80	100
E2	Lb	REFERENCE								
32	30	GB.012.032	GB.016.032	GB.020.032						
40	38	GB.012.040	GB.016.040	GB.020.040	GB.025.040					
50	48	GB.012.050	GB.016.050	GB.020.050	GB.025.050	GB.032.050				
63	61			GB.020.063	GB.025.063	GB.032.063	GB.040.063			
80	78			GB.020.080	GB.025.080	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		



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

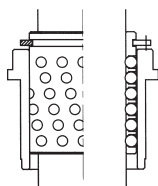
For special applications, it is possible to mount
ball bearing cages that are of different lengths to
the guide bushes.

Legend  On request



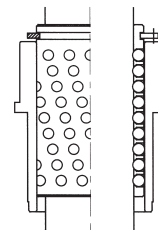
ØD1	12	16	20	25	32	40	50	63	80	100
Øb	2	2	2.5	3.5	4	5	6.5	6	6	7.5
P	2.6	2.8	2.8	3.6	3.9	3.9	4.2	5.2	6.2	8.2
C	3	3	3.3	3.9	4.6	5.3	6	6	7	7
Lc	See table on page opposite									

PA-type ball bearing cage



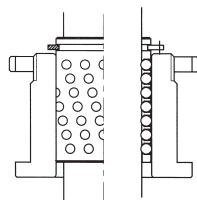
ØD1	12	16	20	25	32	40	50	63	80	100
Height HB	REFERENCE									
25	PA.012.11	PA.016.11	PA.020.10							
32	PA.012.13	PA.016.13	PA.020.12	PA.025.09						
40	PA.012.16	PA.016.16	PA.020.14	PA.025.11	PA.032.09					
50		PA.016.19	PA.020.17	PA.025.13	PA.032.11	PA.040.09				
63			PA.020.20	PA.025.15	PA.032.14	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



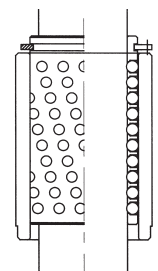
ØD1	12	16	20	25	32	40	50	63	80	100
Height JB	REFERENCE									
25	PA.012.16	PA.016.18								
32	PA.012.18	PA.016.20	PA.020.18	PA.025.15	PA.032.13					
40		PA.016.24	PA.020.20	PA.025.17	PA.032.15	PA.040.13	PA.050.12			
50			PA.020.23	PA.025.19	PA.032.17	PA.040.14	PA.050.14			
63				PA.025.21	PA.032.19	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

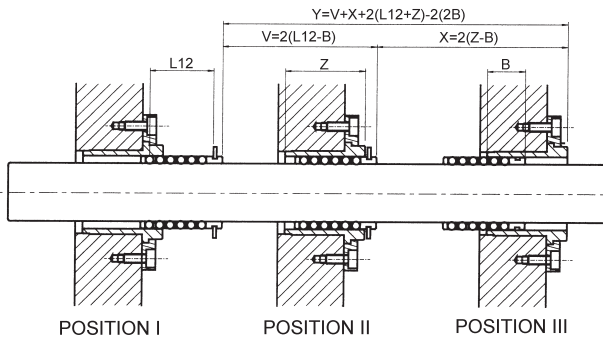


ØD1	12	16	20	25	32	40	50	63	80	100
Height NB	REFERENCE									
12	PA.012.05	PA.016.05								
16		PA.016.07	PA.020.06							
20			PA.020.07	PA.025.06	PA.032.05					
25				PA.025.07	PA.032.06	PA.040.05				
32					PA.032.07	PA.040.06	PA.050.05			
40						PA.040.07	PA.050.06			

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			

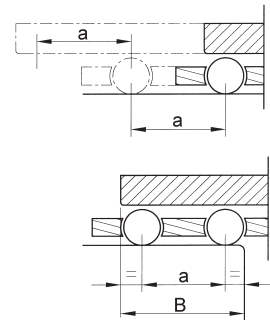


V
Stroke

L12
Distance from the retaining ring to the last row of ball bearings.

Z
Length of guide bush.

B
Safety



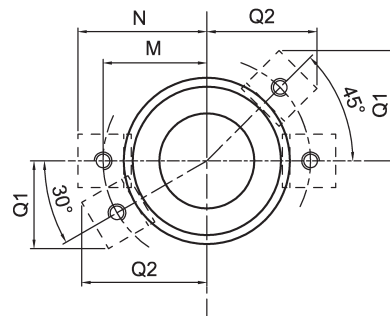
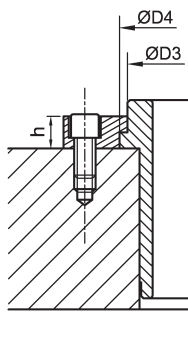
ØD1	12				16				20				25				32				40				50				63				80				100			
B	8				8				10				13				15				19				23				24				29				31			
Ht HB	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc				
25	33	33	50	38.6	33	33	50	38.8	36.4	35	53	42.5																												
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																					109	113	180	118.2	115.9	116	186	126.1	115.9	118	184	127.1								
125																														140.8	143	234	152	140.8	143	224	154			
160																															174	178	290	187.2	179	178	296	194.2		
200																																				219	218	376	234.2	

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				
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																					129.4	128	221	138.6	140.8	141	236	151												
100																										157.4	161	269	167.6	157.4	161	267	168.6							
125																																								
160																																								
200																																								

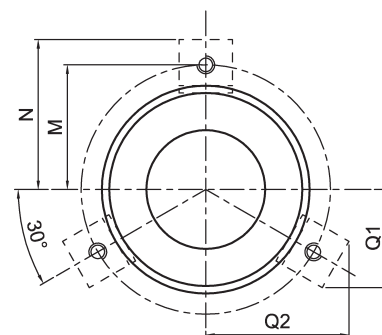
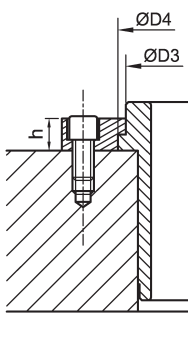
ØD1	12				16				20				25				32				40				50				63				80				100			
Ht NB	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc	L12	Z	V	Lc				
12	15	16	14	20.6	15	16	14	20.8																																
16					21	20	26	26.8	22	21	24	28.1																												
20									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																	39.6	38	49	48.1	41	39	44	50.2	41.2	41	36	51.4												
40																					47.8	47	58	57	49.5	49	52	59.7												

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				
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									79.6	78	139	85.7	80.2	78	134	87.7	78.8	78	128	87.3	75	78	112	84.2	82.7	78	119	92.9												
100																	95.6	98	161	104.1	95.4	98	153	104.6	99.3	98	153	109.5												
125																					122.6	123	207	131.8	124.2	123	202	134.4												
160																										157.4	158	269	167.6											

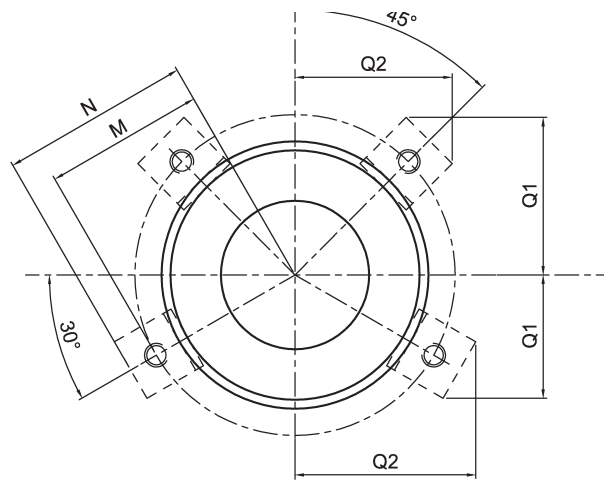
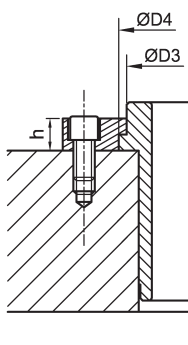
For $\varnothing D1 \leq 25$



For $32 \leq \varnothing D1 \leq 50$



For $\varnothing D1 \geq 63$



ØD1		12	16	20	25	32	40	50	63	80	100	
ØD3		22	29	32	41	51	65	84	100	125	150	160
ØD4		25	32	36	45	56	70	90	110	135	160	170
M		17	20,5	23	27,5	35	42	54	65	77,5	90	95
N		23	26,5	30	34,5	43,5	50,5	64	76	88,5	101	106
T		5	5	7	7	9	9	11	18	18	18	18
à 30°	Q1	16,7	18,4	21,1	23,3	29,5	33	41,5	49,3	55,5	61,8	64,3
	Q2	22,9	25,9	29,5	33,4	42,2	48,2	60,9	72,3	83,1	94	98,3
à 45°	Q1=Q2	20,5	23	26,2	29,3	37,1	42,1	53	62,9	71,8	80,6	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:

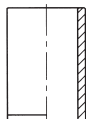
Pillar D1=32 L=180

Please state:
Ref. EPO.032.180

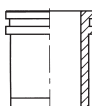
To be used with:



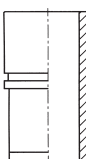
Type 3 ball bearing cage
Type PA



Straight sleeve bush for
ball bearing cage
Type GB

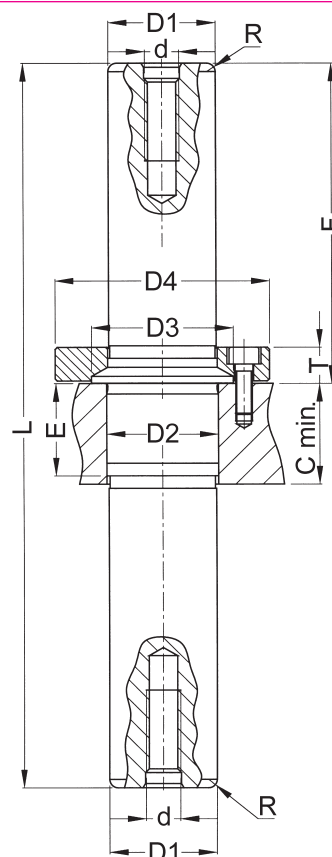
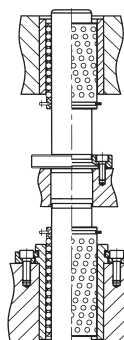
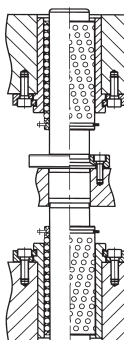
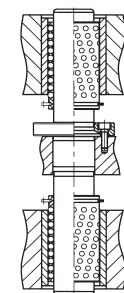


Short demountable bush for
ball bearing cage
Type NB or HB

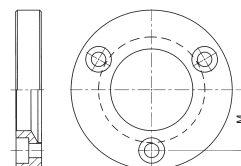


Demountable bush for ball
bearing cage
Type JB

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 min.		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 **Ref.CMF.025.220**

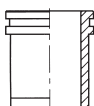
To be used with:



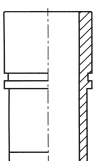
Type 3 ball bearing cage
Type PA



Straight sleeve bush for
ball bearing cage
Type GB

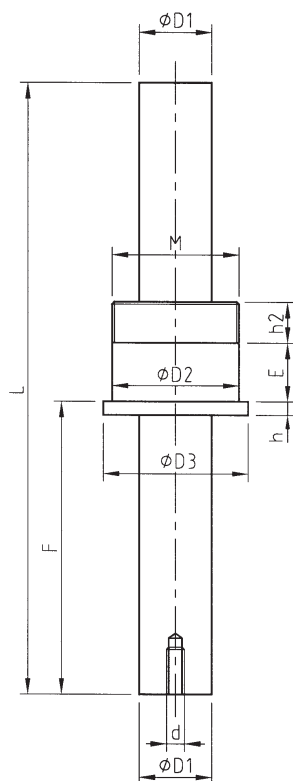
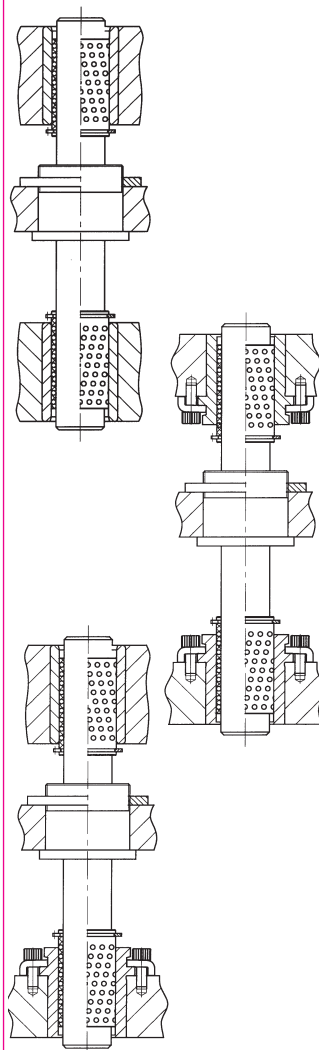


Short demountable bush
for ball bearing cage
Type NB or HB

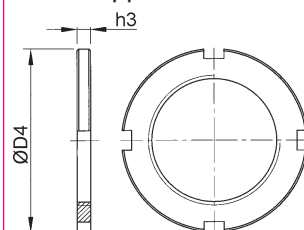


Demountable bush for
ball bearing cage
Type JB

Examples:



Supplied with:



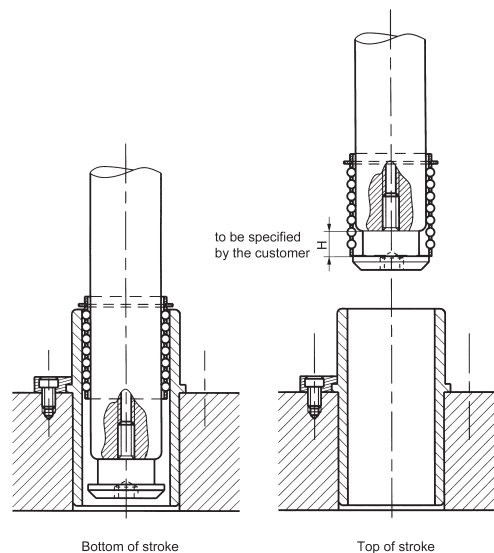
D1			16	20	25	32	40
L	F	E	REFERENCES				
135	65	13	CMF.016.135	CMF.020.135			
200	90	17		CMF.020.200			
165	74	22			CMF.025.165		
215	110	22			CMF.025.215		
220		27			CMF.025.220	CMF.032.220	CMF.040.220
240	112	35				CMF.032.240	CMF.040.240
D2			28	32	40	50	63
D3			32	36	45	56	70
d			M5	M6	M8		
h			3			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



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.

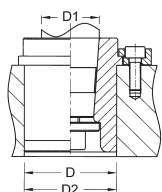
Height H is obtained by stacking the required number of spacers. Other heights can be obtained upon request.

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



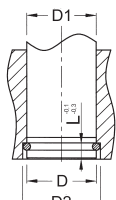
D1	12	16	20	25	32	40	50	63	80
Spacer height	8	8	10	10	10	10	15	15	20
H	REFERENCE								
8	BAD.012.008	BAD.016.008							
10			BAD.020.010	BAD.025.010	BAD.032.010	BAD.040.010			
15							BAD.050.015	BAD.063.015	BAD.080.015
16	BAD.012.016	BAD.016.016							
20			BAD.020.020	BAD.025.020	BAD.032.020	BAD.040.020			
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



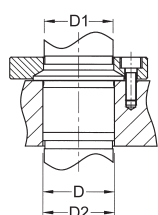
BUSH FOR TAPERED PILLAR, type EB

D1	12	16	20	25	32	40	50	63	80	100
D2	22	28	32	40	50	63	80	90	110	140
D	<u>22.000</u> 22.013	<u>28.000</u> 28.013	<u>32.000</u> 32.016	<u>40.000</u> 40.016	<u>50.000</u> 50.016	<u>63.000</u> 63.019	<u>80.000</u> 80.019	<u>90.000</u> 90.022	<u>110.000</u> 110.022	<u>140.000</u> 140.025



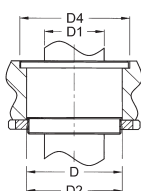
PILLAR WITH LOWER RETAINER, type BA

D1	12	16	20	25	32	40	50	63	80	100
D2	14	18	23	28	37	45	55	70	87	107
L	4	4	6	6	10	10	10	16	16	16
D	<u>11.985</u> 11.996	<u>15.985</u> 15.996	<u>19.983</u> 19.996	<u>24.983</u> 24.996	<u>31.980</u> 31.996	<u>39.980</u> 39.996	<u>49.980</u> 49.996	<u>62.976</u> 62.995	<u>79.976</u> 79.995	<u>99.972</u> 100.000



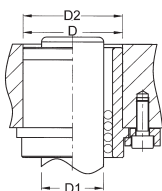
DEMOUNTABLE PILLAR WITH COLLAR, type EPO

D1	20	25	32	40
D2	22	26	34	42
D	<u>21.976</u> 21.989	<u>25.976</u> 25.989	<u>33.972</u> 33.988	<u>41.972</u> 41.988



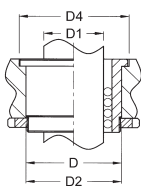
THREADED MIDDLE PILLAR, type CMF

D1	16	20	25	32	40
D2	28	32	40	50	63
D	<u>28.000</u> 28.013	<u>32.000</u> 32.016	<u>40.000</u> 40.016	<u>50.000</u> 50.016	<u>63.000</u> 63.019



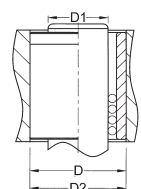
SHORT DEMOUNTABLE BUSH, type HB / DEMOUNTABLE BUSH, type JB

D1	12	16	20	25	32	40	50	63	80	100
D2	22	28	32	40	50	63	80	90	110	140
D	<u>22.000</u> 22.013	<u>28.000</u> 28.013	<u>32.000</u> 32.016	<u>40.000</u> 40.016	<u>50.000</u> 50.016	<u>63.000</u> 63.019	<u>80.000</u> 80.019	<u>90.000</u> 90.022	<u>110.000</u> 110.022	<u>140.000</u> 140.025

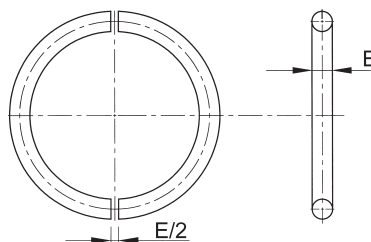
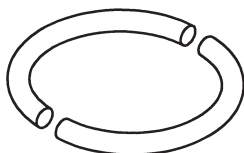


INTERMEDIATE BUSH, type NB / SMOOTH BUSH, type GB

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	<u>22.000</u> 22.013	<u>28.000</u> 28.013	<u>32.000</u> 32.016	<u>40.000</u> 40.016	<u>50.000</u> 50.016	<u>63.000</u> 63.019	<u>80.000</u> 80.019

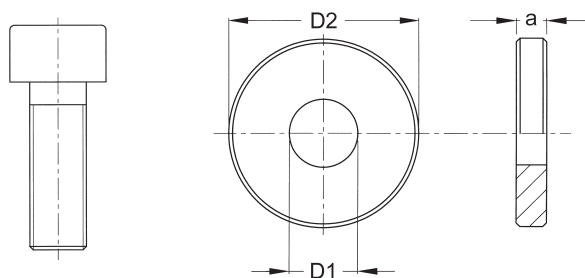
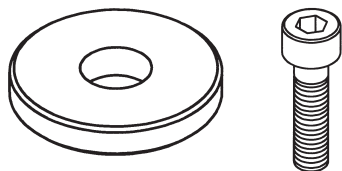


1/2 snap ring for cylindrical pillar with lower retainer.



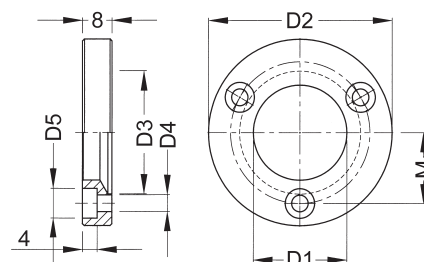
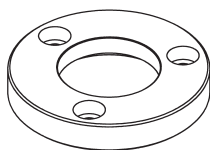
Ø Pillar	12	16	20	25	32
REFERENCE	P01.012.000	P01.016.000	P01.020.000	P01.025.000	P01.032.000
E	1.6		2.5		4.0
Ø Pillar	40	50	63	80	100
REFERENCE	P01.040.000	P01.050.000	P01.063.000	P01.080.000	P01.100.000
E	4.0		6.0		

Retaining washer for pillar with tapered fitting.



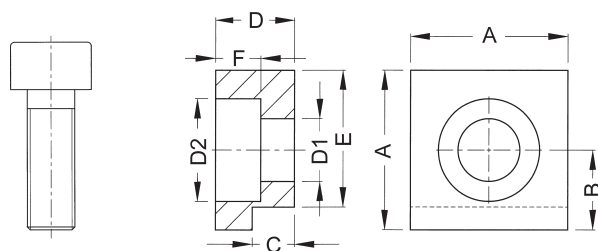
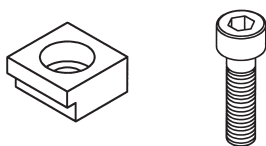
Ø Pillar	12	16	20	25	32
REFERENCE	P03.012.000	P03.016.000	P03.020.000	P03.025.000	P03.032.000
D1	5.5	6.6		9.0	
D2	14	18	22	25	32
a	2	3		4	
Screw	A05.005.012 (M5x12)	A05.006.012 (M6x12)		A05.008.016 (M8x16)	
Ø Pillar	40	50	63	80	100
REFERENCE	P03.040.000	P03.050.000	P03.063.000	P03.080.000	P03.100.000
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 EPO.xxx.xxx



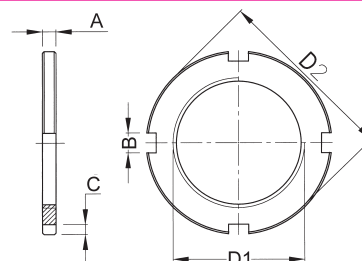
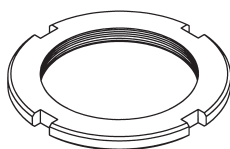
Ø Pillar	20	25	32	40
REFERENCE	P04.020.000	P04.025.000	P04.032.000	P04.040.000
D1	22	26	33	41
D2	44	50	62	71
D3	27	33	40	49
D4	4.5		5.5	6.6
D5	7.5		9	10.5
M	32	38	48	56
Clamp	A05.004.012 (M4x12)		A05.005.012 (M5x12)	A05.006.012 (M6x12)

Mounting 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



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