Precision Bearings for Driven Tools

PTB

Product Data Sheet

We pioneer motion

SCHAEFFLER

1 Precision Bearings for Driven Tools

Schaeffler precision bearings of the series PTB (Precision Tool Bearings) are high-performance, cost-efficient spindle bearings for driven tools. The bearings are available in open or sealed designs.

Advantages of the bearings:

- economical solution, developed specifically for driven tools
- robust design accommodates high axial and radial machining forces
- high power density allows compact tool dimensions
- precision and rigidity ensure high productivity
- easy to fit

Additional advantages of sealed bearings:

- supplied pre-filled with optimum grease type and quantity
- easy handling with no risk of contamination during installation

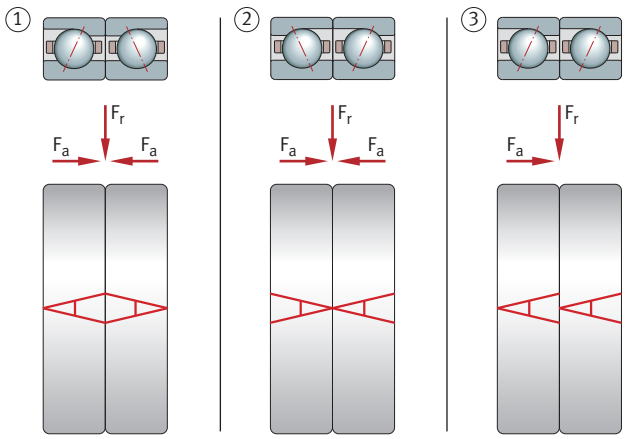
Features of the series:

- outstanding price/performance ratio
- dimension series 70 and 719
- bore codes 00-10
- high axial and radial load carrying capacity
- preload for high rigidity
- bearing rings and rolling elements made of 100Cr6
- bearing contact angle E = 25°
- tolerance class P4
- universal bearing design, single bearings can be combined in any arrangement

2 Bearing design

Precision bearings for driven tools of the series PTB are universal bearings. The bearings can be combined into bearing sets in any arrangement. For simple and error-free installation, each bearing is marked with a contact angle arrow. The contact angle arrow indicates the direction in which the axial load is supported via the outer ring.

1 Bearing sets



3 Lubrication

Sealed bearings are supplied already filled with the correct quantity of high-performance grease. Grease open bearings in accordance with the table.

1 Recommended grease quantities for precision bearings for driven tools

Bore code	Bearing series	
	PTB719	PTB70
	Grease quantity	
	cm^3	cm^3
00	0,09	0,17
01	0,1	0,21
02	0,17	0,32
03	0,17	0,42
04	0,36	0,76
05	0,4	0,86
06	0,42	1,12
07	0,64	1,74
08	1,36	2,35
09	1,6	3
10	1,74	3,3

4 Speeds

The achievable speeds are dependent on the overall energy balance in the system.

The determining factors are as follows:

- number of bearings
- arrangement of bearings
- external load
- lubrication
- heat dissipation.

The limiting speeds are based on elastically preloaded single bearings and are theoretical guide values. In practice, the actual speeds may deviate up or down from the guide values depending on the operating conditions. However, they give a general indication of the speed suitability under ideal conditions, i.e. under low load and when using elastically preloaded single bearings with good heat dissipation. The data for grease lubrication are valid when using the high speed grease in the correct quantity.

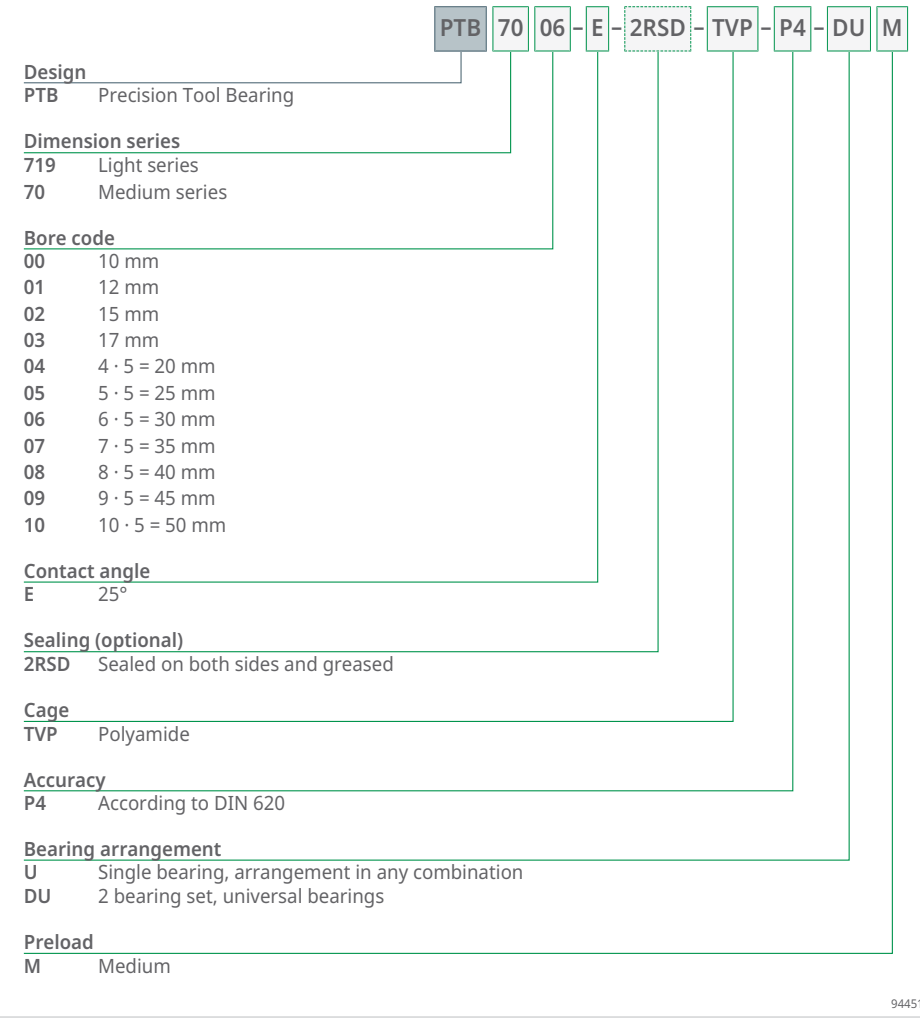
4.1 Reduction factors

The speed limits specified are reduced for rigidly preloaded bearings. In such cases, the speeds must be multiplied by reduction factors according to the bearing arrangement.

Bearing arrangement	Reduction factor
	f_r
	0,6
	0,5
	0,5
	0,57
	0,4

5 Structure of the ordering designation

2 Structure of the ordering designation for precision bearings PTB



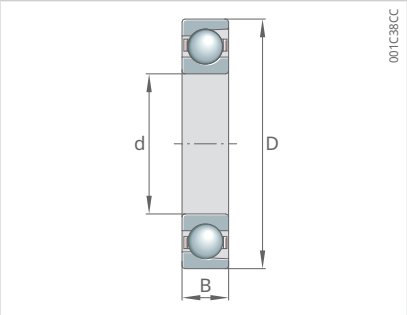
6 Product tables

6.1 Explanations of the product tables

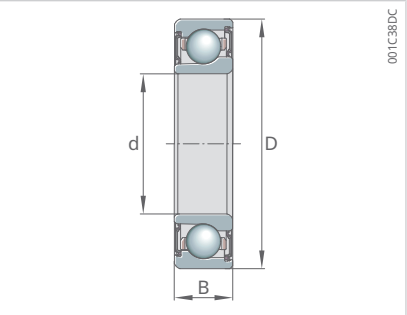
B	mm	Width
C_{0r}	N	Basic static load rating, radial
c_a M	N/µm	Axial rigidity, moderate
C_r	N	Basic dynamic load rating, radial
d	mm	Bore diameter
D	mm	Outside diameter
d_a	mm	Abutment diameter of shaft shoulder
D_a	mm	Abutment diameter of housing shoulder
F_V M	N	Preload force, moderate
K_{aE} M	N	Lift-off force, moderate
m	kg	Mass
n_G grease	min^{-1}	Limiting speed for grease lubrication
r_a	mm	Undercut radius
r_{a1}	mm	Undercut radius

6.2 PTB

Dimension series 70
With large balls
Steel balls, steel rings
Open design
Sealed (optional)



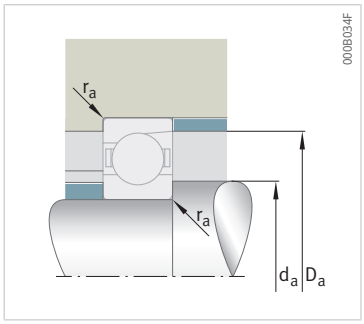
Open design



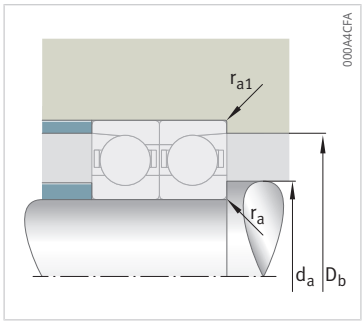
Sealed (optional)

6

Designation	d	D	B	d_a h12	D_a H12	r_a max.	r_{a1} max.
–	mm	mm	mm	mm	mm	mm	mm
PTB7000-E	10	26	8	14	22	0,3	0,1
PTB7001-E	12	28	8	16,5	24,5	0,3	0,1
PTB7002-E	15	32	9	19	29	0,3	0,1
PTB7003-E	17	35	10	21	32	0,3	0,1
PTB7004-E	20	42	12	25	37	0,6	0,3
PTB7005-E	25	47	12	30	42	0,6	0,3
PTB7006-E	30	55	13	36	49	1	0,3
PTB7007-E	35	62	14	41	56	1	0,3
PTB7008-E	40	68	15	46	62	1	0,3
PTB7009-E	45	75	16	51	69	1	0,3
PTB7010-E	50	80	16	56	74	1	0,3



Mounting dimensions

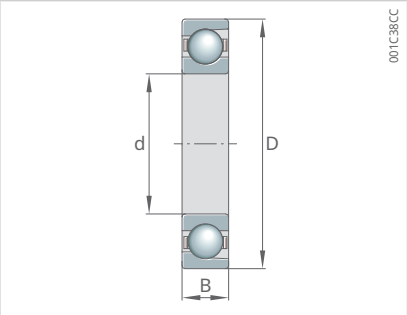


Mounting dimensions

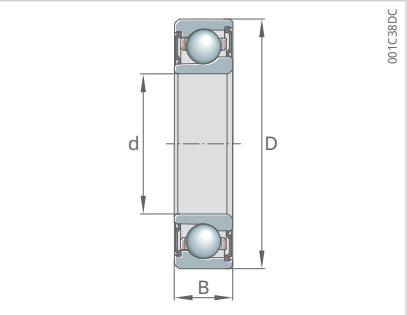
C_r	C_{0r}	n_G grease	F_v M	K_{aE} M	c_a M	m
N	N	min^{-1}	N	N	N/µm	kg
3850	1310	53000	95	287	50	0,02
4350	1630	48000	105	317	58	0,023
5300	1930	40000	170	519	65	0,03
7900	3100	38000	210	631	81	0,039
9000	3400	30000	307	935	87	0,067
12500	5300	26000	431	1310	114	0,077
13800	6400	22000	396	1191	121	0,114
17500	8600	20000	563	1715	149	0,154
19000	10100	18000	597	1815	165	0,189
24300	12500	15000	763	2321	175	0,232
28500	16400	14000	711	2135	197	0,25

6.3 PTB

Dimension series 719
With large balls
Steel balls, steel rings
Open design
Sealed (optional)



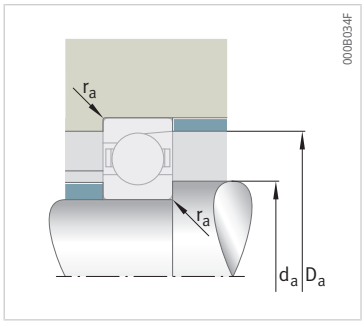
Open design



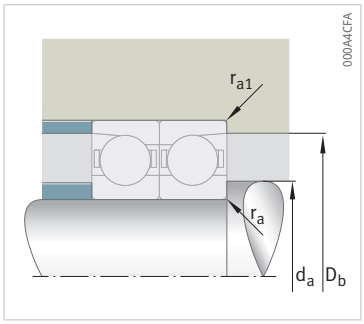
Sealed (optional)

6

Designation	d	D	B	d_a h12	D_a H12	r_a max.	r_{a1} max.
–	mm	mm	mm	mm	mm	mm	mm
PTB71900-E	10	22	6	13	19,5	0,3	0,1
PTB71901-E	12	24	6	15	21,5	0,3	0,1
PTB71902-E	15	28	7	18	25,5	0,3	0,1
PTB71903-E	17	30	7	20	27,5	0,3	0,1
PTB71904-E	20	37	9	24	33,5	0,3	0,15
PTB71905-E	25	42	9	29	38,5	0,3	0,15
PTB71906-E	30	47	9	34	43,5	0,3	0,15
PTB71907-E	35	55	10	40	51,5	0,6	0,15
PTB71908-E	40	62	12	45	58,5	0,6	0,15
PTB71909-E	45	68	12	50	63,5	0,6	0,15
PTB71910-E	50	72	12	55	67,5	0,6	0,15



Mounting dimensions



Mounting dimensions

C_r	C_{0r}	n_G grease	F_v M	K_{aE} M	c_a M	m
N	N	min^{-1}	N	N	N/µm	kg
2550	860	63000	84	256	45	0,01
2900	1070	53000	87	264	51	0,011
4350	1660	45000	122	368	61	0,016
4800	1970	40000	111	333	65	0,018
6600	2850	34000	163	489	78	0,037
7100	3350	28000	212	640	94	0,043
7600	3900	26000	214	643	101	0,05
11300	6400	22000	273	820	129	0,077
16900	9300	18000	447	1348	155	0,109
17800	10500	17000	470	1415	168	0,127
18800	11700	15000	444	1330	174	0,128

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