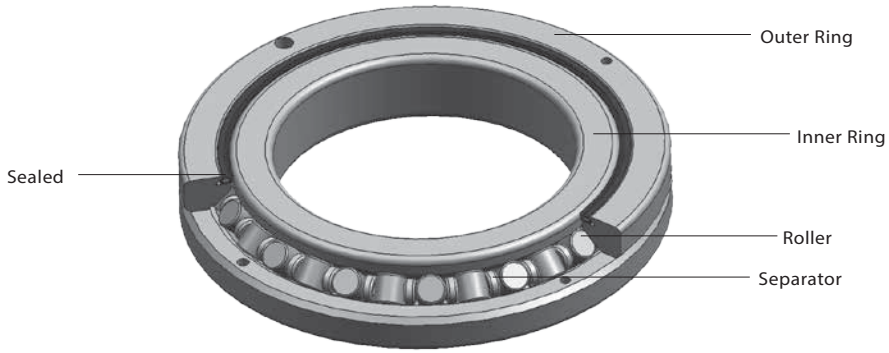
Cross Roller Bearing

Cross Roller Bearing

Construction



Characteristics

To solve the problem of reducing the mechanism which use one bearing to replace two bearing solution. PMI's designs and manufactures a variety of cross roller bearings that can handle radial, thrust and moment loads at the same time. These compact bearing feature rollers crossed at right angles between inner and outer rings. This structure can reduce the combined height required for bearings, achieving high rigidity and excellent load capacity. There are currently Standard type CRB, Mounting Holed type CRBF, Robots Installation type CRBR and Customization type CRBX for choose.

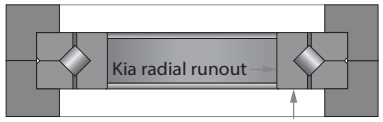
Application

It suitable used in the rotating parts of machine tools, industrial robots, measuring instrument and IC manufacturing.

Features

High Accuracy

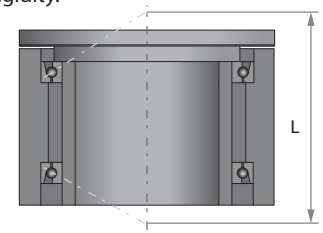
PMI offers precision cross roller bearing in the P2, P4, P5, P6 and P0 grades that to satisfy the needs of customers for precision equipment. The bearings produced by the test are classified that according to the accuracy of the ISO standard.



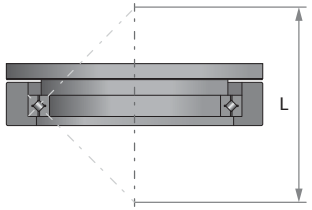
Sia Radial runout

High Rigidity、High Load Capacity

Rollers crossed at right angles between inner and outer rings , the roller and groove contact area compare with ball bearings is bigger and contributing to miniaturization and increase load capacity and rigidity.



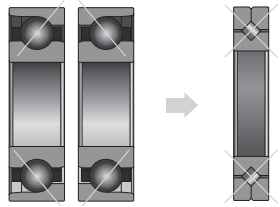
Traditional Ball bearing combination space



Cross roller bearing combination space

Save Space

Traditional Ball bearing combination space larger than Cross roller bearing about 1.5~2times, reduce the design space and miniaturization.



Traditional Ball bearing Cross Roller Bearing

Specification Diversification

Bore diameter 20mm to 110mm available for selection.

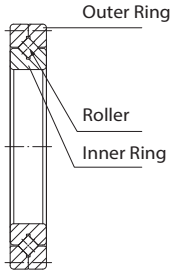
Crowning Rollers

The rollers designed crowning curve that to avoid stress concentrate at both ends of the roller for the reason that it is maximum stress value of the roller can be reduced and the loading is relatively average, so improve the life of cross roller bearing.

Category

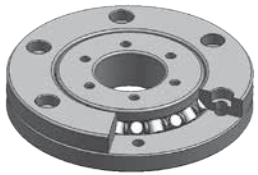
Standard Type - CRBC

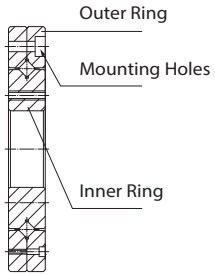
The outer ring is separable, this model is used in locations where accuracy of the inner ring is required. Ex: Rotary part of hollow rotary table.



Mounting Holed Type - CRBF

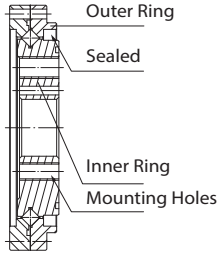
Mounting holes for direct fixing on outer and inner ring, helps produce smaller and lightweight equipment, product design becomes more compact, CRBF can be assembled on the device according to the customers use, reduce the costs and delivery.





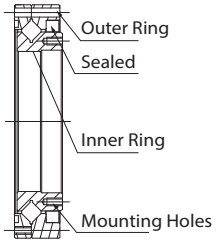
Robots Installation Type - CRBR

Robots Installation type CRBR the outer ring is made of two split pieces, inner ring as a whole structure, mounting holes for direct fixing on mating mounting surface are available, east installation, suitable for harmonic drive CSG(CSF) series and Multi-axis robot.



Hollow Rotary Type - CRBG

Hollow rotary type cross roller bearing, design of the mounting hole makes it easier to install, simplifies the structure of rotating application, it is suitable for rotating positions requiring high precision and compact structure, such as the machining 4th axis and robotic arm joints.

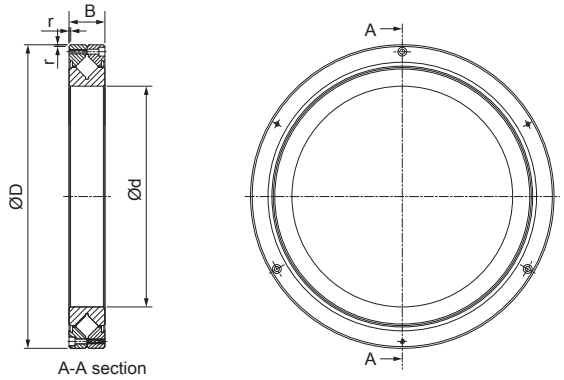


Customization Type - CRBX

The space required for the paired combination of angular bearings is about 1.5~2 times that of cross roller bearings, so the design space and volume can bereduced.

Specification

Standard Type - CRBC



Unit : mm

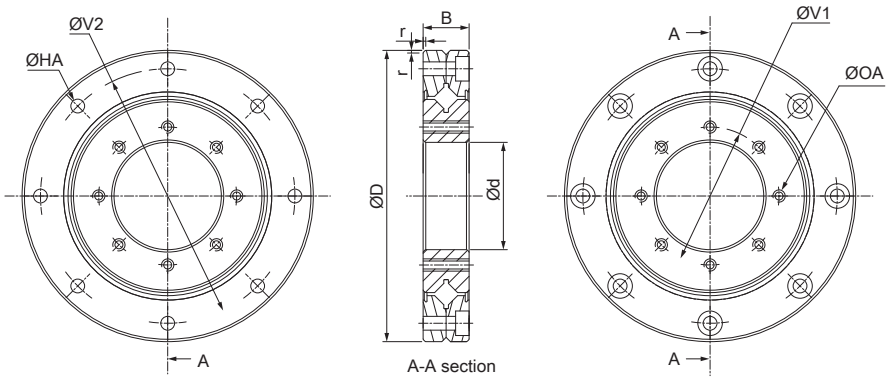
Bearing number	Boundary dimensions			
	D	d	B	r_{min}
CRBC3010	55	30	10	0.5
CRBC4010	65	40	10	0.6
CRBC4510	70	45	10	0.6
CRBC5013	80	50	13	0.7
CRBC6013	90	60	13	0.7
CRBC7013	100	70	13	0.7
CRBC8013	110	80	13	0.8
CRBC8016	120	80	16	0.8
CRBC9016	130	90	16	0.8
CRBC10020	150	100	20	1.0
CRBC11020	160	110	20	1.0

Note*: If you need any others size or specification, please do not hesitate to contact PMI.

Unit : mm

Bearing number	Mass	Basic dynamic load rating	Basic static load rating
	(Ref. Kg)	C(kN)	C(kN)
CRBC3010	0.12	5.3	6.3
CRBC4010	0.15	6	8.1
CRBC4510	0.16	6.7	8.6
CRBC5013	0.29	14.2	19
CRBC6013	0.33	15.2	21.5
CRBC7013	0.38	17	25.5
CRBC8013	0.41	18.6	28.3
CRBC8016	0.72	24.3	37.5
CRBC9016	0.81	27.2	43
CRBC10020	1.43	39.4	61
CRBC11020	1.56	41.2	66.7

Mounting Holed Type - CRBF



Unit : mm

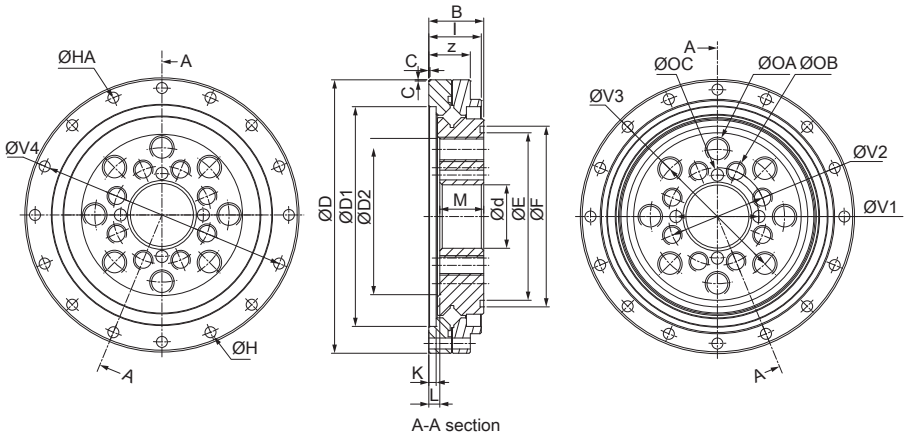
Bearing number	Boundary dimensions						
	D	d	B	M	r_{min}	OA	HA
CRBF1008	Ø52	Ø10	8	8	0.6	4-M3x0.5P	6-Ø3.4 through Ø6.5 counter bore depth 3.3
CRBF2012	Ø70	Ø20	12	12	0.6	6-M3x0.5P	6-Ø3.4 through Ø6.5 counter bore depth 3.3
CRBF2512	Ø80	Ø25	12	12	0.7	6-M3x0.5P	6-Ø3.4 through Ø6.5 counter bore depth 3.3
CRBF3515	Ø95	Ø35	15	15	0.9	8-M4x0.7P	8-Ø4.5 through Ø8 counter bore depth 4.4
CRBF5515	Ø120	Ø55	15	15	0.9	8-M5x0.8P	8-Ø5.5 through Ø9.5 counter bore depth 5.4
CRBF8022	Ø165	Ø80	22	22	1.4	10-M5x0.8P	10-Ø5.5 through Ø9.5 counter bore depth 5.4
CRBF9025	Ø210	Ø90	25	25	1.8	12-M8x1.25P	12-Ø9 through Ø14 counter bore depth 11

Unit : mm

Bearing number	Boundary dimensions		Mass	Basic dynamic load rating	Basic static load rating
	V1 (PCD)	V2 (PCD)	(Ref. Kg)	C(kN)	C(kN)
CRBF1008	Ø16±0.05	Ø42±0.05	0.12	2.4	2.9
CRBF2012	Ø28±0.05	Ø57±0.05	0.31	7.6	8.4
CRBF2512	Ø35±0.05	Ø67±0.05	0.4	8.6	10.6
CRBF3515	Ø45±0.05	Ø83±0.05	0.66	17.3	21
CRBF5515	Ø65±0.05	Ø105±0.05	0.96	20	28
CRBF8022	Ø97±0.05	Ø148±0.05	2.48	55.1	72
CRBF9025	Ø112±0.05	Ø187±0.05	4.9	73.4	108

Note*: If you need any others size or specification, please do not hesitate to contact *PMI*.

Robots Installation Type - CRBR



Unit : mm

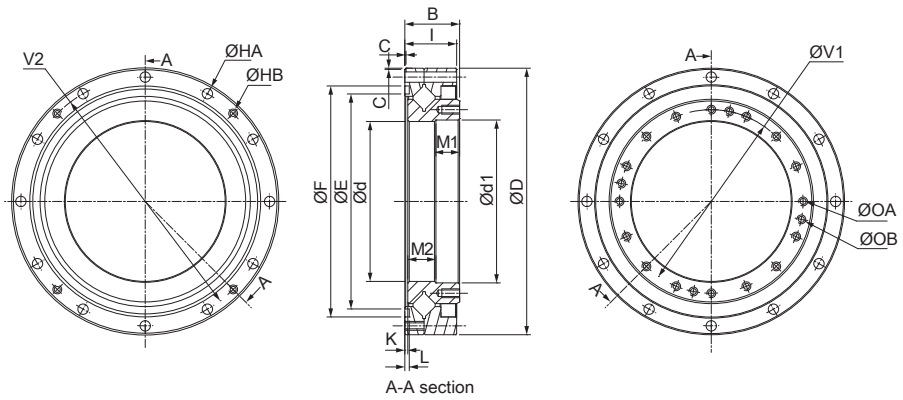
Bearing number	Boundary dimensions														
	D	tolerance	d	D1	tolerance	D2	E	F	M	z	I	B	K	L	C
CRBR14	Ø55	0 / -0.03	Ø11	Ø41.8	+0.02 / 0	Ø28	Ø28.4	Ø29.8	13.5	12	16	16.5	2.5	4	0.3
CRBR17	Ø62	0 / -0.03	Ø10	Ø49	+0.02 / 0	Ø34	Ø33.8	Ø36	13.5	12	16	16.5	2.5	4	0.5
CRBR20	Ø70	0 / -0.03	Ø14	Ø56.5	+0.02 / 0	Ø40	Ø40.2	Ø43	13.5	12.5	16	16.5	2.5	4.5	0.7
CRBR25	Ø85	0 / -0.03	Ø20	Ø67	+0.02 / 0	Ø50	Ø52.6	Ø55.3	15	14	18	18.5	2	3.5	1
CRBR32	Ø112	0 / -0.03	Ø26	Ø90	+0.03 / 0	Ø64	Ø68.6	Ø74	18	17	21.6	22.5	3	4.5	1.2
CRBR40	Ø126	0 / -0.035	Ø24-Ø32	Ø105	+0.03 / 0	Ø79	Ø81.2	Ø86	21.5	16.5	22.5	24	2.5	4.5	1.5

Unit : mm

Bearing number	Boundary dimensions								Mass	Basic dynamic load rating	Basic static load rating
	OA	OB	OC		HA	V1	V2	V3	V4	(Ref. Kg)	C(kN)	C(kN)
CRBR14	6-M4x0.7P	6-M4x0.7P	3-Ø3	±0.01	8-3.5	15	17	23	49	0.1	2.96	3.37
CRBR17	6-M5x0.8P	6-M5x0.8P	3-Ø3	±0.01	10-3.5	15	19	27	56	0.15	3.54	4.03
CRBR20	8-M6x1P	8-M5x0.8P	4-Ø3	+0.02 / 0	12-3.5	19	24	32	64	0.24	5.48	7.73
CRBR25	8-M8x1.25P	8-M6x1P	4-Ø3	+0.02 / 0	16-3.5	26	30	42	79	0.5	6.6	9.3
CRBR32	8-M10x1.5P	8-M8x1.25P	4-Ø5	±0.03	16-4.5	34	40	55	104	1.24	10.4	13.3
CRBR40	8-M10x1.5P	8-M10x1.5P	4-Ø5	±0.03	20-4.0	42	50	68	117	1.7	24.6	38

Note*: If you need any others size or specification, please do not hesitate to contact *PMI*

Hollow Rotary Type - CRBG



Unit : mm

Bearing number	Boundary dimensions												
	D	tolerance	d	d1	E	F	M1	M2	I	B	K	L	C
CRBG14	70	0 / -0.013	36±0.05	Ø38	53	57	5	9.6	14.1	15.1±0.05	0.5	1.1	0.5
CRBG17	80	0 / -0.013	45.5±0.05	Ø47	63	68	6.5	9.9	16	17±0.05	0.6	1.1	0.5
CRBG20	90	0 / -0.015	54±0.05	Ø55	72.6	78	8	9.5	17.5	18.5±0.05	1	1.5	0.5
CRBG25	110	0 / -0.015	66±0.05	Ø67	90	94.8	7.5	12.2	18.7	20.7±0.05	1	1.5	1
CRBG32	142	0 / -0.018	84±0.05	Ø88	117.6	123	8	15.4	23.4	24.4±0.05	1	1.5	1.2
CRBG40	170	0 / -0.02	106±0.05	Ø108	142.6	148	9.5	19	29	30±0.05	1.5	1.5	1.5
CRBG45	190	0 / -0.02	118±0.05	Ø120	164	170	9.5	22	32	33±0.05	1.5		2

Unit : mm

Bearing number	Boundary dimensions						Mass	Basic dynamic load rating	Basic static load rating
	OA	OB	HA	HB	V1	V2	(Ref. Kg)	C(kN)	C(kN)
CRBG14	12-M3x0.5Px6L	-	8-Ø3.5	2-M3x0.5Px7L	44	64	0.25	5.5	7.94
CRBG17	20-M3x0.5Px6L	-	12-Ø3.5	4-M3x0.5Px10L	54	74	0.34	7.1	9.5
CRBG20	16-M3x0.5Px6L	4-M3x0.5Px6L	12-Ø3.5	4-M3x0.5Px6.5L	62	84	0.44	14.8	20.6
CRBG25	16-M4x0.7Px8L	4-M3x0.5Px6L	12-Ø4.5	4-M3x0.5Px7.5L	77	102	0.73	19.2	31.5
CRBG32	16-M5x0.8Px8L	4-M4x0.7Px8L	12-Ø5.5	4-M4x0.7Px9L	100	132	1.49	26.7	41.25
CRBG40	16-M6x1Px10L	4-M5x0.8Px10L	12-Ø6.6	4-M4x0.7Px11L	122	158	2.62	32.6	50.1
CRBG45	12-M8x1.25Px10L	4-M5x0.8Px10L	12-Ø6.6	4-M4x0.7Px14L	140	180	3.65	57.6	94.5

Note*: If you need any others size or specification, please do not hesitate to contact *PMI*.

Dimension combination accuracy definition

(Table one) Tolerances and allowable values of inner ring and tolerances of outer ring width

Unit : μm

d		⊿dmp								⊿B_s		⊿C_s	
Nominal bearing inside diameter		Single plane mean bore dia. Deviation								Deviation of a single inner ring width		Deviation of a single outer ring width	
mm		Class 0		Class 6		Class 5		Class 4					
above	below (Incl.)	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
18	30	0	-10	0	-8	0	-6	0	-5	0	-75	0	-100
30	50	0	-12	0	-10	0	-8	0	-6	0	-75	0	-100
50	80	0	-15	0	-12	0	-9	0	-7	0	-75	0	-100
80	120	0	-20	0	-15	0	-10	0	-8	0	-75	0	-100
120	150	0	-25	0	-18	0	-13	0	-10	0	-100	0	-120
150	180	0	-25	0	-18	0	-13	0	-10	0	-100	0	-120
180	250	0	-30	0	-22	0	-15	0	-12	0	-100	0	-120
250	315	0	-35	0	-25	0	-18	-	-	0	-120	0	-150
315	400	0	-40	0	-30	0	-23	-	-	0	-150	0	-200
400	500	0	-45	0	-35	-	-	-	-	0	-150	0	-200
500	630	0	-50	0	-40	-	-	-	-	0	-150	0	-200
630	800	0	-75	-	-	-	-	-	-	0	-150	0	-200

(Table two) Tolerances and allowable values of outer ring

Unit : μm

D		⊿Dmp							
Nominal bearing outer diameter		Single plane mean bore dia. Deviation							
mm		Class 0		Class 6		Class 5		Class 4	
above	below (Incl.)	High	Low	High	Low	High	Low	High	Low
30	50	0	-11	0	-9	0	-7	0	-6
50	80	0	-13	0	-11	0	-9	0	-7
80	120	0	-15	0	-13	0	-10	0	-8
120	150	0	-18	0	-15	0	-11	0	-9
150	180	0	-25	0	-18	0	-13	0	-10
180	250	0	-30	0	-20	0	-15	0	-11
250	315	0	-35	0	-25	0	-18	0	-13
315	400	0	-40	0	-28	0	-20	-	-
400	500	0	-45	0	-33	0	-23	-	-
500	630	0	-50	0	-38	0	-28	-	-
630	800	0	-75	0	-45	-	-	-	-
800	1000	0	-100	0	-60	-	-	-	-
1000	1030	0	-125	-	-	-	-	-	-

(Table three) Accuracy of inner ring run-out

Unit : μm

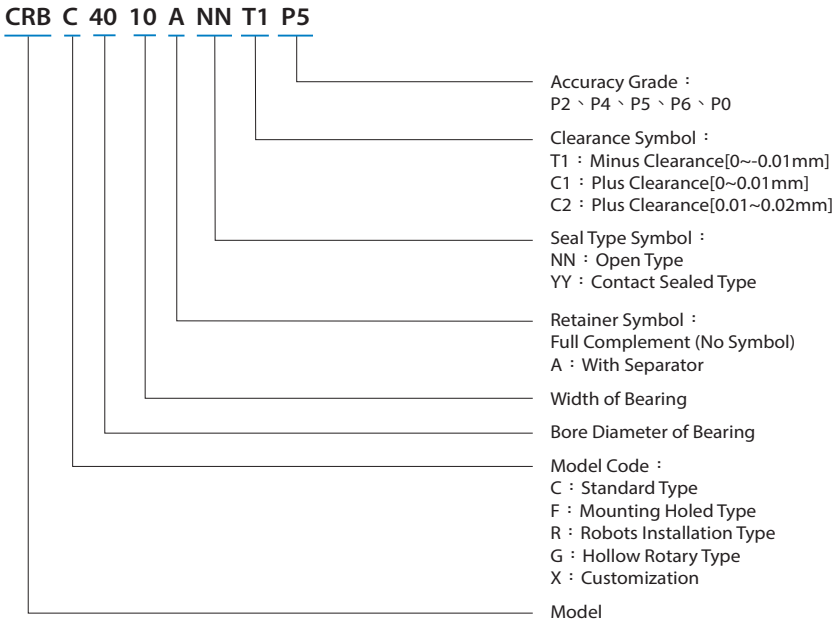
d		Kia					Sia				
Nominal bearing inside diameter		Radial run-out					Axial run-out				
mm		Class 0	Class 6	Class 5	Class 4	Class 2	Class 0	Class 6	Class 5	Class 4	Class 2
above	below (Incl.)										
18	30	13	8	4	3	2.5	13	8	4	3	2.5
30	50	15	10	5	4	2.5	15	10	5	4	2.5
50	80	20	10	5	4	2.5	20	10	5	4	2.5
80	120	25	13	6	5	2.5	25	13	6	5	2.5
120	150	30	18	8	6	2.5	30	18	8	6	2.5
150	180	30	18	8	6	5	30	18	8	6	5
180	250	40	20	10	8	5	40	20	10	8	5
250	315	50	25	13	10	7	50	25	13	10	7
315	400	60	30	15	12	8	60	30	15	12	8
400	500	65	35	18	14	10	65	35	18	14	10
500	630	70	40	20	16	12	70	40	20	16	12
630	800	80	50	25	20	15	80	50	25	20	15

(Table four) Accuracy of outer ring run-out

Unit : μm

d		Kea					Sea				
Nominal bearing outer diameter		Radial run-out					Axial run-out				
mm		Class 0	Class 6	Class 5	Class 4(2)	Class 2(2)	Class 0	Class 6	Class 5	Class 4	Class 2
above	below (Incl.)										
30	50	20	10	7	5	2.5	20	10	7	5	2.5
50	80	25	13	8	5	4	25	13	8	5	4
80	120	35	18	10	6	5	35	18	10	6	5
120	150	40	20	11	7	5	40	20	11	7	5
150	180	45	23	13	8	5	45	23	13	8	5
180	250	50	25	15	10	7	50	25	15	10	7
250	315	60	30	18	11	7	60	30	18	11	7
315	400	70	35	20	-	-	70	35	20	-	-
400	500	80	40	23	-	-	80	40	23	-	-
500	630	100	50	25	-	-	100	50	25	-	-
630	800	120	60	30	-	-	120	60	30	-	-
800	1000	120	75	35	-	-	120	75	35	-	-
1000	1030	120	75	35	-	-	120	75	35	-	-

Description of Specification



Precautions for use

1. The normal operating temperature of the bearing is 10 - 80 ℃. If it exceeds this temperature range, the resin or rubber parts may be deformed and damaged.
2. When foreign matter enters inside of the bearing, it may cause damage to the rolling path of the roller or loss of function. Please pay attention to the cleaning of parts, environment and tools during installation. To prevent foreign matter, dust, etc. from entering the inside of the bearing.
3. If the impact force is applied to the bearing during use, the track surface and the roller will be cracked and indented, resulting in shortened bearing life, so care must be taken.
4. When foreign matter such as chips is found to adhere or invade between the inner and outer rings of the bearing, clean and refill the grease.
5. Please pay attention to the installation, when using the outer ring fixed and inner ring rotation, if need to correct the adjustment, you can only hit the outer ring
6. When installing or removing the bearing, do not apply force to the fixing pin or screw.

Supplement

Appendix

PMI Ballscrews Request Form

Date：

Company：	Address：	
Tel：		
Fax：	Country：	
Machine Type：	Delivery Point：	
Application：	Desired Delivery Date：	Quantity：

1 Required Specifications

A. Thread Direction： ☐ L ☐ R　Number Of Thread (1~4)：

B. Screw Nominal O.D：　| Lead：　| Effective Turns：

C. Thread Length：　| Overall Length：　| Accuracy Grade：

D. Nut Type： ☐ Miniature Series ☐ End Deflector Series ☐ External Ball Circulation Series ☐ Internal Ball Circulation Series ☐ High Lead Series ☐ Heavy Load Series ☐ End Cap Series

2 Load Condition

A. Stroke：　*mm*　| Max. Rotation Speed：　*r.p.m*　| Motor Specifications：　*kw*

B. Mounting Method： ☐ Vertical ☐ Horizontal ☐ Obligue　Declining Angle：　| Mounting Span：　*mm*

C. Accelereation Time：　*S*　| Accelereation Speed：　m/s^2　| Rapid Feed Speed：　*m/min*

D. Life：　$\times 10^6$ *revs*　| *km*　| *hr*

E. Working Axial Load：

Rapid Feed：	*kgf*	Feed Speed：	*mm/min*	Time：	Ratio(%)
Light Cutting：	*kgf*	Feed Speed：	*mm/min*	Time：	Ratio(%)
Heavy Cutting：	*kgf*	Feed Speed：	*mm/min*	Time：	Ratio(%)

F. Max. Axial Static Load：　*kgf*

G. Table Weight：　*kg*　| Work Piece Weight：　*kg*

H. Linear Guide Way： ☐ Ball Type ☐ Roller Type | ☐ Box Way

I. Mount Method： ☐ Fixed-Fixed ☐ Fixed-Supported ☐ Fixed-Free ☐ Supported-Supported

3 Lead Accuracy, Axial Clearance, Preload and Stiffness

A. Specified Travel (T)：　*mm*

B. Positioning Accuracy：　*mm*(No Load)　| Repeatability Accuracy：　*mm*(No Load)

C. Preload：　*kgf*（Preload Torque：　*kgf/cm*）

D. Axial play：　*mm* (No Load)

E. Nut Stiffness：　*kgf/μm*

4 Other Conditions

A. Lubrication Oil：　| Grease：　| Other：

B. Ambient Temperature：　☐ ℃ ☐ ℉

C. Special Conditions：

P.S. The specifications in this cataloguea are subject to change without notification, For other special requirements, please contact us.

PMI Linear Guideway Request Form

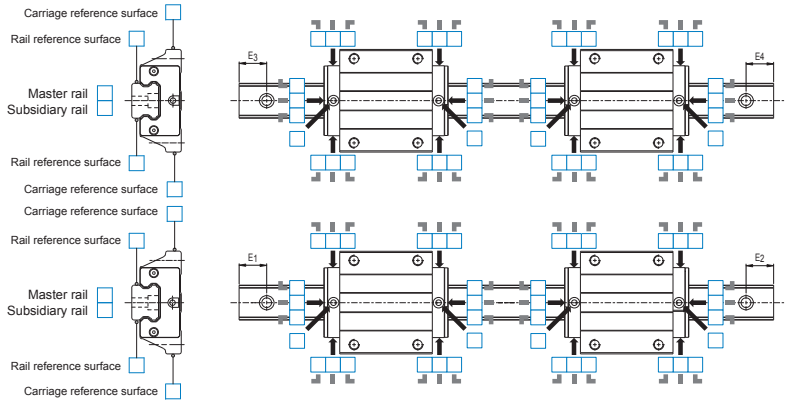
Date：

Customer Name：	Address：
Tel：	
Fax：	Machine Type：
Contact Person：	Drawing No.：

Installation Direction	☐ H type	☐ R type	☐ V type	☐ K type	☐ T type	☐ RV type	☐ Others
Carriage Type							
Size							
No. of Carriages	☐1 ☐2 ☐3 ☐4 ☐Others:						
Dust Protection	☐ No symbol ☐ UU ☐ SS ☐ ZZ ☐ DD ☐ KK ☐ LL ☐ RR						
Rail Protection	☐ No symbol ☐ CC ☐ MC ☐ MD						
Preload Grade	☐ FZ ☐ FC ☐ F0 ☐ F1 ☐ F2						
Rail Type	☐ Counter-bore (R type) ☐Counter-bore (U type) ☐ Tapped hole (T type)						
Rail Length & Pitch	Length: E1: E2: E3: E4:						
Accuracy Grade	☐ N ☐ H ☐ P ☐ SP ☐ UP						
Rail per Axis	☐ 1 ☐ 2 ☐ 3 ☐Others:						
Lubrication Type	☐ Grease ☐ Oil						
Lubrication Fitting	☐ Grease nipple (Code:) ☐ Oil piping joint (Code:)						
Full Code of Specification							
Required Quantity							

Reference surface & Lubrication Location

Lubrication Location and direction



Nonspecified cases followed by PMI standards. For other special requirements, please contact us.The specifications in this catalogue are subject to change without notification.

Service Life Calculation of *PMI* Linear Guideway

Date :

Company :	Address :
Tel :	
Fax :	Machine Type :
Contact Person :	Others :

working condition

Velocity:
V= *m/sec*

Acceleration time:
T1= *sec*
T2= *sec*
T3= *sec*

Stroke length:
Ls= *mm*

Number of reciprocations per minute:
N= min^{-1}

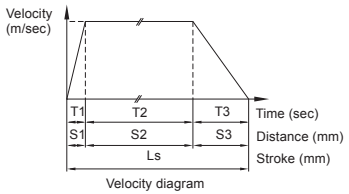
Thrust point:
A1= *mm*
A2= *mm*

Carriage span:
L1= *mm*

Rail span:
L2= *mm*

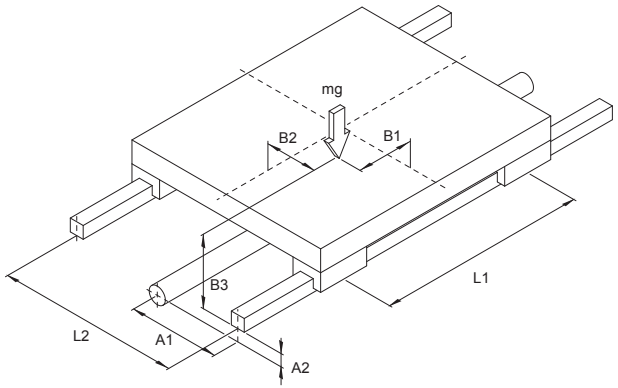
Mass:
m= *kg*

Gravity point:
B1= *mm* B3= *mm*
B2= *mm*



Velocity diagram

Horizontal application



Service Life Calculation of *PMI* Linear Guideway

Date :

Company :	Address :
Tel :	
Fax :	Machine Type :
Contact Person :	Others :

working condition

Velocity:
V= *m/sec*

Acceleration time:
T1= *sec*
T2= *sec*
T3= *sec*

Stroke length:
Ls= *mm*

Number of reciprocations per minute:
N= min^{-1}

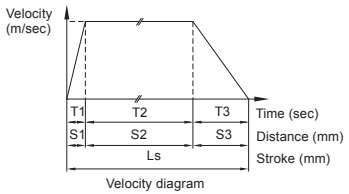
Thrust point:
A1= *mm*
A2= *mm*

Carriage span:
L1= *mm*

Rail span:
L2= *mm*

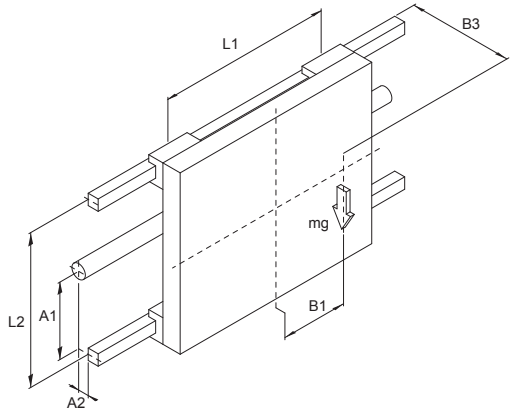
Mass:
m= *kg*

Gravity point:
B1= *mm* B3= *mm*



Velocity diagram

Wall installation application



Service Life Calculation of *PMI* Linear Guideway

Date :

Company :	Address :
Tel :	
Fax :	Machine Type :
Contact Person :	Others :

working condition

Velocity:
V= *m/sec*

Acceleration time:
T1= *sec*
T2= *sec*
T3= *sec*

Stroke length:
Ls= *mm*

Number of reciprocations per minute:
N= *min⁻¹*

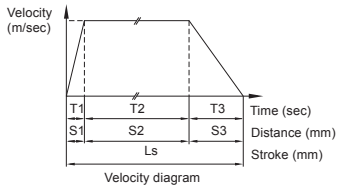
Thrust point:
A1= *mm*
A2= *mm*

Carriage span:
L1= *mm*

Rail span:
L2= *mm*

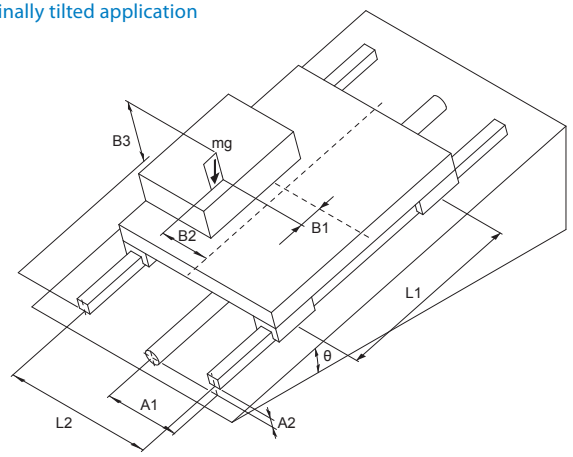
Mass:
m= *kg*

Gravity point:
B1= *mm* B3= *mm*
B2= *mm* θ= *Degree*



Velocity diagram

Longitudinally tilted application



Service Life Calculation of *PMI* Linear Guideway

Date :

Company :	Address :
Tel :	
Fax :	Machine Type :
Contact Person :	Others :

working condition

Velocity:
V= *m/sec*

Acceleration time:
T1= *sec*
T2= *sec*
T3= *sec*

Stroke length:
Ls= *mm*

Number of reciprocations per minute:
N= *min⁻¹*

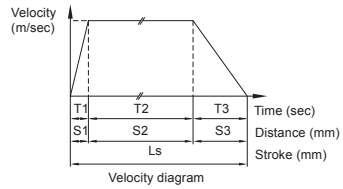
Thrust point:
A1= *mm*
A2= *mm*

Carriage span:
L1= *mm*

Rail span:
L2= *mm*

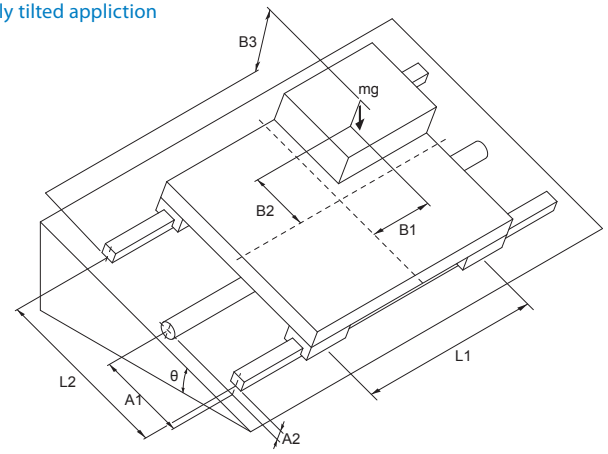
Mass:
m= *kg*

Gravity point:
B1= *mm* B3= *mm*
B2= *mm* θ= *Degree*



Velocity diagram

Laterally tilted appliction



Service Life Calculation of *PMI* Linear Guideway

Date :

Company :	Address :
Tel :	
Fax :	Machine Type :
Contact Person :	Others :

working condition

Velocity:

V= *m/sec*

Acceleration time:

T1= *sec*

T2= *sec*

T3= *sec*

Stroke length:

Ls= *mm*

Number of reciprocations per minute:

N= min^{-1}

Thrust point:

A1= *mm*

A2= *mm*

Carriage span:

L1= *mm*

Rail span:

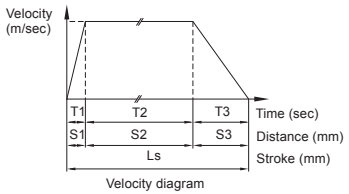
L2= *mm*

Mass:

m= *kg*

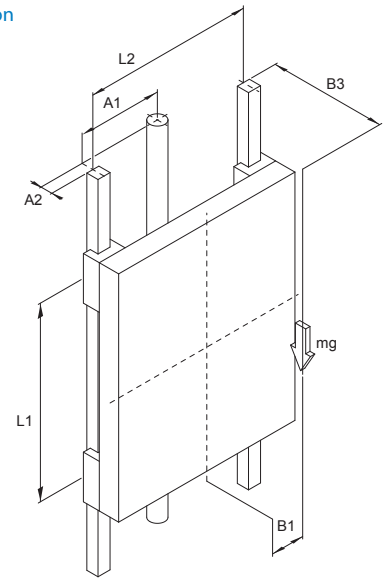
Gravity point:

B1= *mm* B3= *mm*



Velocity diagram

Vertical application



Service Life Calculation of *PMI* Actuator

Date :

Company :	Address :
Tel :	
Fax :	Machine Type :
Contact Person :	Others :

working condition

Preselection actuator specification:

Carriage span:

L1= *mm*

Mass and load:

M1= *kg*

M2= *kg*

M3= *kg*

Stroke:

LS= *mm*

Velocity:

V= *m/sec*

Acceleration time:

T1= *sec*

T2= *sec*

T3= *sec*

Acceleration/Deceleration:

a= m/sec^2

Number of reciprocations per minute

N= *1/min*

Gravity point:

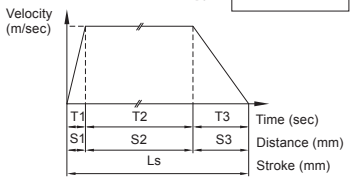
B1= *mm* B5= *mm*

B2= *mm* B6= *mm*

B3= *mm* B7= *mm*

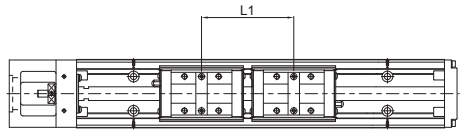
B4= *mm* B8= *mm*

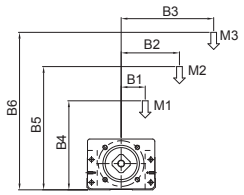
B9= *mm*

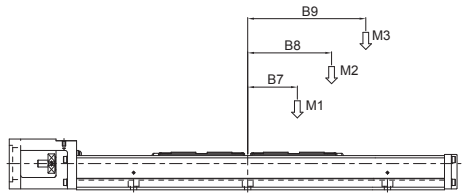


Velocity diagram

Horizontal application







Service Life Calculation of *PMI* Actuator

Date：

Company：	Address：
Tel：	
Fax：	Machine Type：
Contact Person：	Others：

Preselection actuator specification:

Carriage span:

L1= mm

Mass and load:

M1= kg

M2= kg

M3= kg

Stroke:

LS= mm

Velocity:

V= m/sec

Acceleration time:

T1= sec

T2= sec

T3= sec

Acceleration/Deceleration:

a= m/sec^2

Number of reciprocations per minute

N= 1/min

Gravity point:

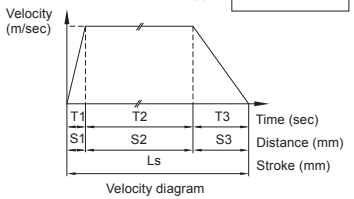
B1= mm B5= mm

B2= mm B6= mm

B3= mm B7= mm

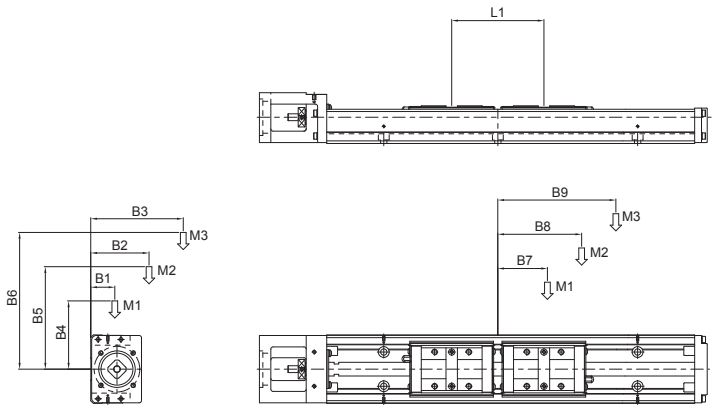
B4= mm B8= mm

B9= mm



Velocity diagram

Wall installation application



Service Life Calculation of *PMI* Actuator

Date：

Company：	Address：
Tel：	
Fax：	Machine Type：
Contact Person：	Others：

Preselection actuator specification:

Carriage span:

L1= mm

Mass and load:

M1= kg

M2= kg

M3= kg

Stroke:

LS= mm

Velocity:

V= m/sec

Acceleration time:

T1= sec

T2= sec

T3= sec

Acceleration/Deceleration:

a= m/sec^2

Number of reciprocations per minute

N= 1/min

Gravity point:

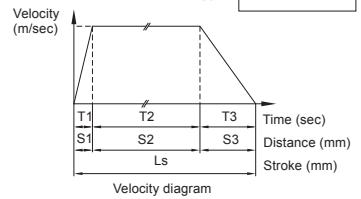
B1= mm B5= mm

B2= mm B6= mm

B3= mm B7= mm

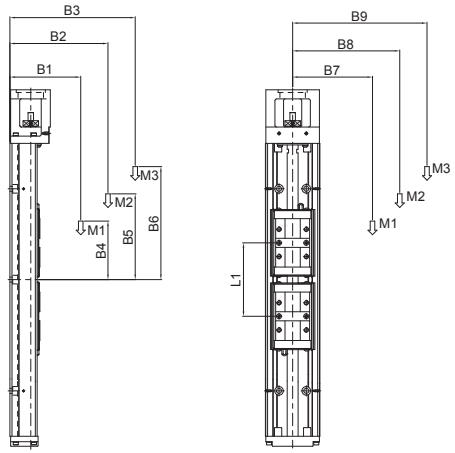
B4= mm B8= mm

B9= mm



Velocity diagram

Vertical application



Dimensional Tolerance of Standard Sheet for Shafts and Holes

Unit: μm

Diametional range		Standard Spindle Diametion Tolerance																			
above	up to and incl.	e7	e8	e9	f6	f7	f8	g5	g6	h5	h6	h7	h8	h9	js5	js6	js7	k5	k6	m5	m6	n6
-	3	-14 -24	-14 -28	-14 -39	-6 -12	-6 -16	-6 -20	-2 -6	-2 -8	0 -4	0 -6	0 -10	0 -14	0 -25	±2	±3	±5	+4 0	+6 0	+6 +2	+8 +2	+10 +4
3	6	-20 -32	-20 -38	-20 -50	-10 -18	-10 -22	-10 -28	-4 -9	-4 -12	-0 -5	0 -8	0 -12	0 -18	0 -30	±2.5	±4	±6	+6 +1	+9 +1	+9 +4	+12 +4	+16 +8
6	10	-25 -40	-25 -47	-25 -61	-13 -22	-13 -28	-13 -35	-5 -11	-5 -14	0 -6	0 -9	0 -15	0 -22	0 -36	±3	±4.5	±7	+7 +1	+10 +1	+12 +6	+15 +6	+19 +10
10	14	-32 -50	-32 -59	-32 -75	-16 -27	-16 -34	-16 -43	-6 -14	-6 -17	0 -8	0 -11	0 -18	0 -27	0 -43	±4	±5.5	±9	+9 +1	+12 +1	+15 +7	+18 +7	+23 +12
14	18																					
18	24	-40 -61	-40 -73	-40 -92	-20 -33	-20 -41	-20 -53	-7 -16	-7 -20	0 -9	0 -13	0 -21	0 -33	0 -52	±4.5	±6.5	±10	+11 +2	+15 +2	+17 +8	+21 +8	+28 +15
24	30																					
30	40	-50 -75	-50 -89	-50 -112	-25 -41	-25 -50	-25 -64	-9 -20	-9 -25	0 -11	0 -16	0 -25	0 -39	0 -62	±5.5	±8	±12	+13 +2	+18 +2	+20 +9	+25 +9	+33 +17
40	50																					
50	65	-60 -90	-60 -106	-60 -134	-30 -49	-30 -60	-30 -76	-10 -23	-10 -29	0 -13	0 -19	0 -30	0 -46	0 -74	±6.5	±9.5	±15	+15 +2	+21 +2	+24 +11	+30 11	+39 +20
65	80																					
80	100	-72 -107	-72 -126	-72 -159	-36 -58	-36 -71	-36 -90	-12 -27	-12 -34	0 -15	0 -22	0 -35	0 -54	0 -87	±7.5	±11	±17	+18 +3	+25 +3	+28 +13	+35 +13	+45 +23
100	120																					
120	140	-85 -125	-85 -148	-85 -185	-43 -68	-43 -83	-43 -106	-14 -32	-14 -39	0 -18	0 -25	0 -40	0 -63	0 -100	±9	±12.5	±20	+21 +3	+28 +3	+33 +15	+40 +15	+52 +27
140	160																					
160	180																					
180	200	-100 -146	-100 -172	-100 -215	-50 -79	-50 -96	-50 -122	-15 -35	-15 -44	0 -20	0 -29	0 -46	0 -72	0 -115	±10	±14.5	±23	+24 +4	+33 +4	+37 +17	+46 +17	+60 +31
200	225																					
225	250																					

Unit: μm

Diametional range		Standard Housing Diametion Tolerance																			
above	up to and incl.	E7	E8	E9	F6	F7	F8	G6	G7	H6	H7	H8	H9	H10	JS6	JS7	K6	K7	M6	M7	N5	N7
-	3	+24 +14	+28 +14	+39 +14	+12 +6	+16 +6	+20 +6	+8 +2	+12 +2	+6 0	+10 0	+14 0	+25 +0	+40 0	±3	±5	0 -6	0 -10	-2 -8	-2 -12	-4 -10	-4 -14
3	6	+32 +20	+38 +20	+50 +20	+18 +10	+22 +10	+28 +10	+12 +4	+16 +4	+8 0	+12 0	+18 0	+30 0	+48 0	±4	±6	+2 -6	+3 -9	-1 -9	0 -12	-5 -13	-4 -16
6	10	+40 +25	+47 +25	+61 +25	+22 +13	+28 +13	+35 +13	+14 +5	+20 +5	+9 0	+15 +0	+22 0	+36 0	+58 0	±4.5	±7	+2 -7	+5 -10	-3 -12	0 -15	-7 016	-4 -19
10	14	+50 +32	+59 +32	+75 +32	+27 +16	+34 +16	+43 +16	+17 +6	+24 +6	+11 0	+18 0	+27 0	+43 0	+70 0	±5.5	±9	+2 -9	+6 -12	-4 -15	0 -18	-9 -20	-5 -23
14	18																					
18	24	+61 +40	+73 +40	+92 +40	+33 +20	+41 +20	+53 +20	+20 +7	+28 +7	+13 0	+21 0	+33 0	+52 0	+84 0	±6.5	±10	+2 -11	+6 -15	-4 -17	0 -21	-11 -24	-7 -28
24	30																					
30	40	+75 +50	+89 +50	+112 +50	+41 +25	+50 +25	+64 +25	+25 +9	+34 +9	+16 0	+25 0	+39 0	+62 0	+100 0	±8	±12	+3 -13	+7 -18	-4 -20	0 -25	-12 -28	-8 -33
40	50																					
50	65	+90 +60	+106 +60	+134 +60	+49 +30	+60 +30	+76 +30	+29 +10	+40 +10	+19 0	+30 0	+46 0	+74 0	+120 0	±9.5	±15	+4 -15	+9 -21	-5 -24	0 -30	-14 -33	-9 -39
65	80																					
80	100	+107 +72	+126 +72	+159 +72	+58 +36	+71 +36	+90 +36	+34 +12	+47 +12	+22 0	+35 0	+54 0	+87 0	+140 0	±11	±17	+4 -18	+10 -25	-6 -28	0 -35	-16 -38	-10 -45
100	120																					
120	140	+125 +85	+148 +85	+185 +85	+68 +43	+83 +43	+106 +43	+39 +14	+54 +14	+25 0	+40 0	+63 0	+100 0	+160 0	±12.5	±20	+4 -21	+12 -28	-8 -33	0 -40	-20 -45	-12 -52
140	160																					
160	180																					
180	200	+146 +100	+172 +100	+215 +100	+79 +50	+96 +50	+122 +50	+44 +15	+61 +15	+29 0	+46 0	+72 0	+115 0	+185 0	±14.5	±23	+5 -24	+13 -33	-8 -37	0 -46	-22 -51	-14 -60
200	225																					
225	250																					