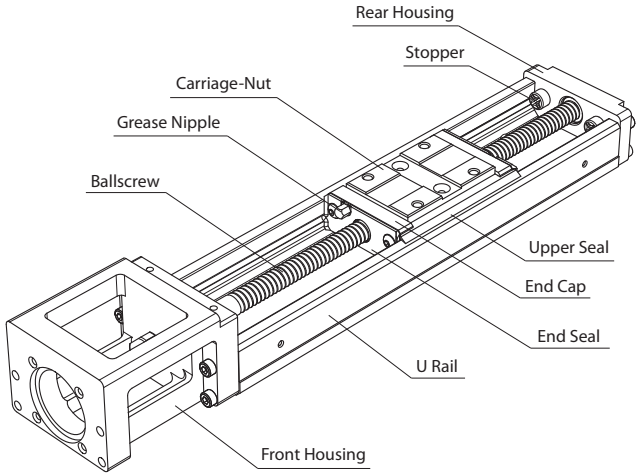
KM Series

Construction

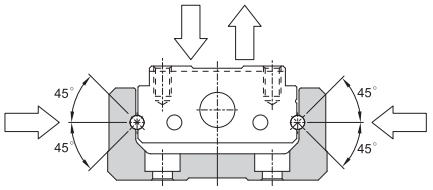


Characteristics

KM series consist of linear guideway unit and ballscrew unit. For saving space, ***PMI*** combine the carriage of linear guideway and nut of ballscrew to a integral Carriage-Nut. The carriage-nut cooperate with the U rail designed for high rigidity to achieve the high rigidity and high accuracy in the minimal space, especially to saving time of installation. Moreover, the design of two rows with Gothic-arch groove and contact angle of 45°can bear four directional loading.

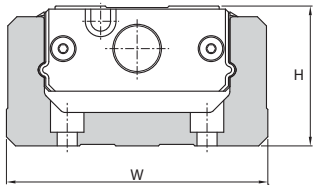
Four Directional Equal Load

KM series are applied two rows with Gothic-arch groove and designed to contact angle of 45° which enables it to carry an equal load in radial, reversed radial and lateral directions to suit to any mounting orientation.



Saving Space

Combine the carriage of linear guideway and nut of ballscrew to a carriage-nut, KM series can achieve the best use of space.

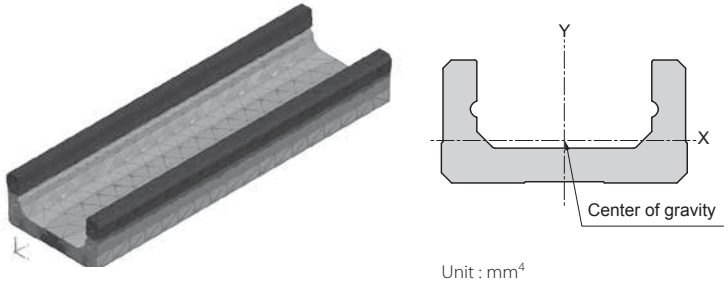


Unit : mm

Model	H	W
KM15	15	30
KM20	20	40
KM26	26	50
KM30	30	60
KM 33	33	60
KM 45	45	80
KM 46	46	86
KM 55	55	100
KM 65	65	130

High Rigidity

Base on the optimal analysis of FEM for the shape of U rail, it has the balance between light weight and high rigidity.



Unit : mm^4

Model	I_X	I_Y
KM15	$1.3x10^3$	$1.5x10^4$
KM20	$5.8x10^3$	$6.0x10^4$
KM26	1.6×10^4	1.5×10^5
KM30	4.4×10^4	3.3×10^5
KM 33	6.1×10^4	3.8×10^5
KM 45	1.5×10^5	1.1×10^6
KM 46	2.5×10^5	1.6×10^6
KM 55	2.3×10^5	2.3×10^6
KM 65	4.7×10^5	5.9×10^6

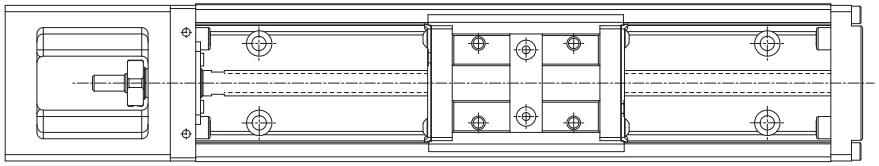
Note* I_X : Geometrical moment of inertia around X axis
I_Y : Geometrical moment of inertia around Y axis

High Accuracy

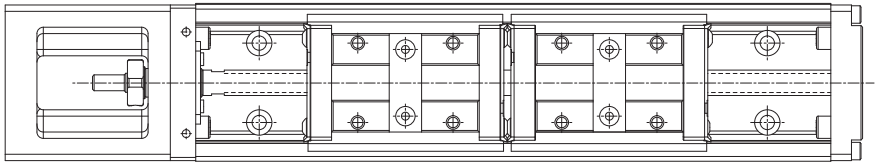
The design of two rows with Gothic-arch groove and stable manufacturing technology can control the variation by load at the minimum. It can provide the smooth feed with high accuracy.

Carriage-Nut Type

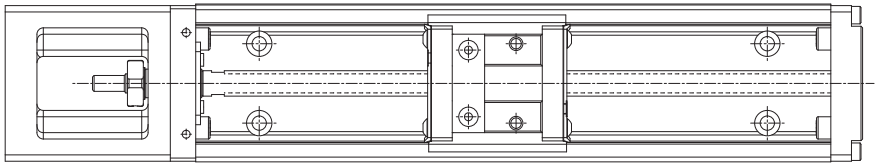
A Type : A single carriage-nut with standard length



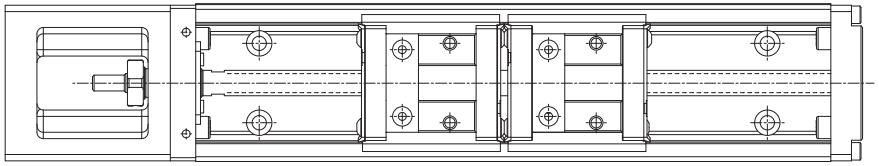
B Type : Two carriage-nuts with standard length



C Type* : A single carriage-nut with short length



D Type* : Two carriage-nuts with short length



Note* : C and D type are only optional for KM30, KM33, KM45 and KM46 model.

Description of Specification

KM33 05 A +400 P 0 -0 0 30 CA AA

Model

Ballscrew Lead

Carriage-Nut type

A : A single carriage-nut with standard length

B : Two carriage-nuts with standard length

C : A single carriage-nut with short length

D : Two carriage-nuts with short length

Rail length (mm)

Accuracy grade

N : Normal grade

P : Precision grade

With / Without a Motor

0 : None

1 : With a Motor (mounted at *PMI*)

With / Without a Cover

0 : None

1 : With a Cover

2 : With a Bellows

Sensor Specification (see **page C1-13**)

Type of Motor Bracket type (see **page C1-15**)

Surface treatment mode :

No symbol : Black Chrome Plating + Special Fluororesin(PS-CF)

CB : Black oxide treatment

CE: Black Chrome Plating(PS-C)

CA : Electroless Nickel

Code of special type

AA : Special process

A1 : Heighten housing

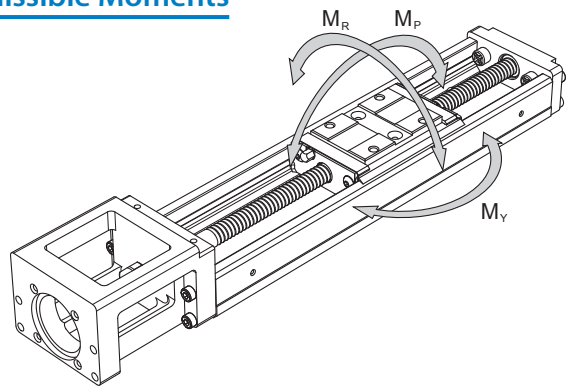
No symbol : Standard housing

Load Ratings

The load ratings of KM series are divided to linear guideway and ballscrew, the load ratings of each part are shown below.

Model		Linear Guideway				Ballscrew					
		Basic dynamic load rating C (kN)		Basic static load rating C_0 (kN)		Basic dynamic load rating Ca (kN)	Basic static load rating C_{0a} (kN)	Ballscrew diameter (mm)	Lead (mm)	Thread minor diameter (mm)	Ball center to center diameter (mm)
		A、B	C、D	A、B	C、D	Normal、Precision N、P	Normal、Precision N、P				
KM 15	KM 15 01	2.35	-	4.32	-	0.54	0.87	5	1	4.28	5.1
	KM 15 02					0.4	0.5		2		
KM 20	KM 20 01	4.75	-	8.33	-	0.76	1.26	6	1	5.28	6.1
	KM 20 02					0.6	0.9		2		
	KM 20 06					0.98	1.37		6	4.6	6.3
KM 26	KM 26 02	7.99	-	15.23	-	2.50	4.02	8	2	6.6	8.3
	KM 26 06					1.18	1.67		6		
KM 30	KM 30 05	12.21	7.91	22.11	11.90	2.94	5.10	12	5	10.3	12.4
	KM 30 10					2.84	4.51		10	9.9	
	KM 30 20					2.45	3.72		20		
KM 33	KM 33 05	12.21	7.91	22.11	11.90	2.94	5.10	12	5	10.3	12.4
	KM 33 10					2.84	4.51		10	9.9	
	KM 33 20					2.45	3.72		20		
KM 45	KM 45 10	26.35	16.26	46 .65	23.33	6.66	11.86	15	10	12.3	15.6
	KM 45 20					5.00	8.53		20	12.3	15.6
	KM 4520C					4.40	7.30		20	12.3	15.6
KM 46	KM 46 10	26.35	16.26	46.65	23.33	6.66	11.86	15	10	12.3	15.6
	KM 46 20					5.00	8.53		20	12.3	15.6
	KM 4620C					4.40	7.30		20	12.3	15.6
KM 55 20		36.73	-	65.29	-	6.08	12.15	20	20	17.3	20.6
KM 65 25		50.75	-	81.62	-	9.02	18.91	25	25	21.6	25.7

Static Permissible Moments



Unit : N-m

Model		Static Permissible Moments											
		Mp				M_Y				M_R			
		A	B	C	D	A	B	C	D	A	B	C	D
KM 15	KM15 01 KM15 02	14.2	74.5	-	-	14.2	74.5	-	-	46.8	93.5	-	-
KM 20	KM20 01 KM20 02 KM20 06	38.2	192.6	-	-	38.2	192.6	-	-	114.6	229.1	-	-
KM 26	KM 26 02 KM 26 06	107.3	501.8	-	-	107.3	501.8	-	-	278.6	557.3	-	-
KM 30	KM 30 05 KM 30 10 KM 30 20	156.6	858.5	43.8	326.4	156.6	858.5	43.8	326.4	462.0	924.0	248.8	497.6
KM 33	KM 33 05 KM 33 10 KM 33 20	156.6	858.5	43.8	326.4	156.6	858.5	43.8	326.4	462.0	924.0	248.8	497.6
KM 45	KM 45 10 KM 45 20 KM 4520C	575.0	2678.0	120.0	1245.6	575.0	2678.0	120.0	1245.6	1334.2	2668.5	762.4	1524.8
KM 46	KM 46 10 KM 46 20 KM 4620C	575.0	2678.0	120.0	1245.6	575.0	2678.0	120.0	1245.6	1397.9	2795.8	798.8	1597.6
KM 55 20		858.4	4617.2	-	-	858.4	4617.2	-	-	2347.2	4694.4	-	-
KM 65 25		1299.6	7001.3	-	-	1299.6	7001.3	-	-	3917.9	7835.8	-	-

Note*: The static permissible moments of B and D type are base on two carrage nuts used in closed contact with each other.

Accuracy Grade

KM series is classified into normal grade (N) and precision grade (P) , the standards are shown below.

Model	Rail Length (mm)	Positioning Repeatability(mm)		Positioning Accuracy(mm)		Running of Parallelism(mm)		Backlash (mm)		Starting Torque (N-cm)	
		Nomal N	Precision P	Nomal N	Precision P	Nomal N	Precision P	Nomal N	Precision P	Nomal N	Precision P
KM 15	75	±0.01	±0.003	-	0.02	-	0.01	0.02	0.002	0.4	0.8
	100										
	125										
	150										
	175										
	200										
KM 20	100	±0.01	±0.003	-	0.02	-	0.01	0.02	0.003	0.5	1.2
	150										
	200										
KM 26	150	±0.01	±0.003	-	0.02	-	0.01	0.02	0.003	2	4
	200										
	250										
	300										
KM 30	150	±0.01	±0.003	-	0.02	-	0.01	0.02	0.003	7	15
	200										
	300										
	400										
	500				0.025		0.015				
	600										
KM 33	150	±0.01	±0.003	-	0.02	-	0.01	0.02	0.003	7	15
	200										
	300										
	400										
	500				0.025		0.015				
	600										
KM 45	340	±0.01	±0.003	-	0.025	-	0.015	0.02	0.003	10	15
	440										
	540										
	640										
	740				0.03		0.02				17
	840										
	940				0.04		0.03				25
KM 46	340	±0.01	±0.003	-	0.025	-	0.015	0.02	0.003	10	15
	440										
	540										
	640										
	740				0.03		0.02				17
	840										
	940				0.04		0.03				25
KM 55	980	±0.01	±0.005	-	0.035	-	0.025	0.05	0.003	12	17
	1080										
	1180				0.04		0.03				20
	1280				0.045		0.035			15	23
	1380				0.05		0.04				25
KM 65	980	±0.01	±0.005	-	0.035	-	0.025	0.05	0.005	12	20
	1180										
	1380									15	22
	1680	±0.012			0.04		0.03				

Maximum Travel Speed and the Maximum Length

KM series is limited by the dangerous speed of the ballscrew and the DN value regardless, the maximum travel speed and the maximum length are shown below.

Unit : mm

Model	Ballscrew Lead	Rail Length	Maximum Travel Speed (mm/s)		Maximum Length	
			Normal N	Precision P	Normal N	Precision P
KM 15	1	75	137	190	200	200
		100				
		125				
		150				
		175				
		200				
	2	75	273	273	200	200
		100				
		125				
		150				
		175				
		200				
KM 20	1	100	100	100	200	200
		150				
		200				
	2	100	200	200	200	200
		150				
		200				
KM 26	2	150	200	200	300	300
		200				
		250				
		300				
	6	150	600	600	300	300
		200				
		250				
		300				
KM 30	5	150	500	500	600	600
		200				
		300				
		400				
		500				
		600	340	340		
	10	150	1000	1000	600	600
		200				
		300				
		400				
		500		980		
		600	980	650		
	20	150	2000	2000	-	-

Model	Ballscrew Lead	Rail Length	Maximum Travel Speed (mm/s)		Maximum Length	
			Normal N	Precision P	Normal N	Precision P
KM 45	10	340	520	740	940	740
		440				
		540				
		640				
		740		730		
		840				
		940	430	-		
	20	340	1050	1480	940	740
		440				
		540				
		640				
		740		1440		
		840				
		940	840	-		
KM 46	10	340	520	740	940	740
		440				
		540				
		640				
		740		730		
		840				
		940	430	-		
	20	340	1050	1480	940	740
		440				
		540				
		640				
		740		1440		
		840				
		940	840	-		
KM 55	20	980	800	1120	1380	1180
		1080		900		
		1180	740	740		
		1280	620	-		
		1380	530	-		
KM 65	25	980	800	1120	1680	1380
		1180				
		1380		830		
		1680	550	-		

Life Calculation

KM series consists of a linear guideway, a ballscrew and a support bearing. The calculation of nominal life of each component is shown below. The nominal life is defined as the total running distance that 90% of identical linear guideways or ballscrew in a group, when they are applied under the same conditions, can work without developing flaking.

Linear Guideway

$$L = \left(\frac{f_c}{f_w} \cdot \frac{C}{P}\right)^3 \times 50 \text{ km}$$

L : Nominal life (km)
fc : Contact factor (see Table 1)
fw : Load factor (see Table 2)
C : Basic dynamic load rating (N)
P : Calculated applied load (N)

Table 1

Carriage-Nut Type	Contact factor fc
A、C	1.00
B、D	0.81

Ballscrew and Bearing

$$L = \left(\frac{1}{f_w} \cdot \frac{C_a}{P_a}\right)^3 \times 10^6 \text{ rev}$$

L : Nominal life (rev)
fw : Load factor (see Table 2)
Ca : Basic dynamic load rating (N)
Pa : Applied axial load (N)

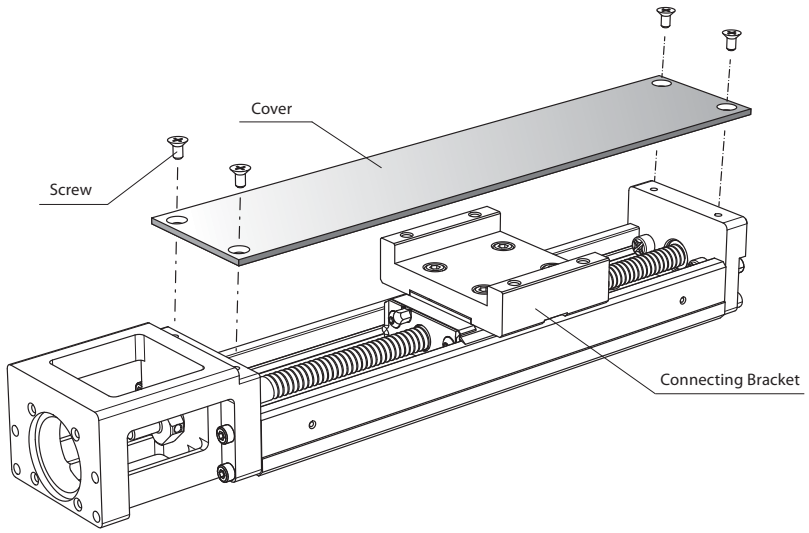
Table 2

Motion Condition	Operating Speed	Load factor fw
No Impact & Vibration	V≦15m/min	1.0~1.2
Slight Impact & Vibration	15＜V≦60m/min	1.2~1.5
Moderate Impact & Vibration	60＜V≦120m/min	1.5~2.0
Strong Impact & Vibration	V≧120m/min	2.0~3.5

Options

Cover

KM series provides cover and transfer seat option. The detail size could be refered by specification tables of product, please.



Bellows

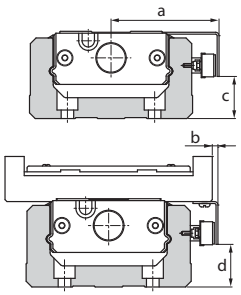
For KM series, a bellows is available for option. Please contact ***PMI***.

Sensor

For KM series, a optional proximity sensors and photo sensors are available as an option. Models equipped with a sensor are provided with a dedicated sensor rail / detecting plate. Please see the table below.

Symbol	Description	Type	Accessory
0	None	-	-
1	with Sensor rail	-	Mounting Screw
2	Photo sensor (3 units)	EE-SX671 (Omron)	Mounting Screw / Nut, Detecting Plate, Sensor Rail, Mounting Plate, Connector (EE-1001)
3	Photo sensor (3 units)	EE-SX674 (Omron)	Mounting Screw / Nut, Detecting Plate, Sensor Rail, Mounting Plate, Connector (EE-1001)
4	Proximity sensor a-contact (On when close, 3 units)	GX-F12A(Panasonic)	Mounting Screw/Nut、Detecting Plate、Sensor Rail
5	Proximity sensor b-contact (On when away, 3 units)	GX-F12B(Panasonic)	Mounting Screw/Nut、Detecting Plate、Sensor Rail
A	Proximity sensor a-contact (Single) b-contact (Double)	GX-F12A(Single) GX-F12B(Double)	Mounting Screw/Nut、Detecting Plate、Sensor Rail

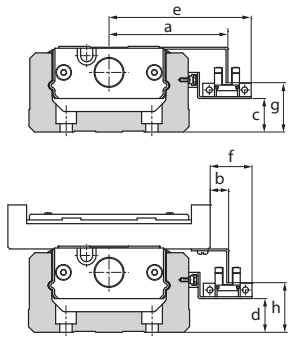
The dimension of installation for sensor:



Panasonic GX-F12A、GX-F12B

Model	a	b	c	d
KM 20	34.2	8.2	3.5	3.5
KM 26	38.9	7.9	6.2	6.2
KM 30	44	4	8.2	8.2
KM 33	44	1	9.2	10
KM 45	54.0	2.0	13.2	13
KM 46	57.0	1.0	22.2	23
KM 55	64	2	21.2	22.7
KM 65	79.0	-6.0	23.3	23.3

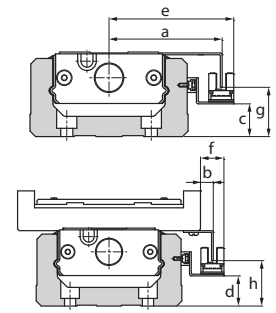
Unit : mm



Omron EE-SX671

Model	a	b	c	d	e	f	g	h
KM 20	41	15	1.5	1.5	53.5	27.5	8	8
KM 26	46.0	15.0	2.0	2.0	58.5	27.5	10.5	10.5
KM 30	50.9	10.9	3.8	3.8	63.4	23.4	12.8	14
KM 33	50.9	7.9	5.0	5.0	63.4	20.4	13.8	15
KM 45	60.5	8.9	8.8	8.8	73.4	21.4	17.7	19
KM 46	63.9	7.9	18.0	18.0	76.4	20.4	26.5	28
KM 55	72	8.8	17.0	17.0	83.3	21.3	25.5	27
KM 65	85.8	0.8	19.0	19.0	98.3	13.3	27.7	27.7

Unit : mm



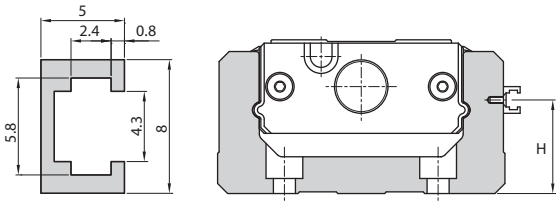
Omron EE-SX674

Model	a	b	c	d	e	f	g	h
KM 20	38.7	12.7	1.3	1.3	45	19	8.5	8.5
KM 26	43.7	12.7	1.8	1.8	50.0	19.0	10.8	10.8
KM 30	48.6	8.6	3.6	3.6	54.9	14.9	12.8	12.6
KM 33	48.6	5.6	4.8	4.8	54.9	11.9	13.8	14
KM 45	58.6	6.6	8.8	8.8	64.9	12.9	18.2	19.3
KM 46	61.6	5.6	17.8	17.8	67.9	11.9	26.8	28.1
KM 55	68.5	6.9	16.8	16.8	74.8	12.8	26.8	27.5
KM 65	83.5	-1.5	19.0	19.0	89.8	4.8	28.3	28.3

Unit : mm

The dimension of sensor rail

Unit : mm



Model	H
KM 15	5.5
KM 20	9.5
KM 26	12
KM 30	14
KM 33	15
KM 45	19
KM 46	28
KM 55	27
KM 65	30

Intermediate Flange

KM series allow different motors to be attached by intermediate flange. Please see the table below when ordering.

Unit : mm

Brand of Motor	Model	KM 20	KM 26	KM 30	KM 33	KM 45	KM 46	KM 55	KM 65	KM 65
Yaskawa Electric AC servomotor	SGMAH-A3(30W)		1A	2A	3A	3A	4A	4A		
	SGMAH-A5(50W)		1A	2A	3A	3A	4A	4A		
	SGMAH-01(100W)				3A	3A	4A	4A		
	SGMPH-01(100W)						40	40	50	6C
	SGMAH-02(200W)						40	40	50	6C
	SGMAH-04(400W)						40	40	50	6C
	SGMPH-02(200W)								5C	60
	SGMPH-04(400W)								5C	60
	SGMAH-08(750W)								5C	6G
Mitsubishi Electric AC servomotor	HC-MFS053(50W)		1A	2A	3A	3A	4A	4A		
	HC-MFS13(100W)				3A	3A	4A	4A		
	HC-MFS23(200W)						40	40	50	6C
	HC-KFS23(200W)						40	40	50	6C
	HC-MFS43(400W)						40	40	50	6C
	HC-KFS43(400W)						40	40	50	6C
	HC-MFS73(750W)								5C	6G
	HC-KFS73(750W)								5C	6G
Matsushita Electric AC servomotor	MSMD5A(50W)		1D	2D	3D	3D	4D	4D		
	MSMD01(100W)				3D	3D	4D	4D		
	MSMD02(200W)							40		
	MSMD04(400W)							40		
	MSMD08(750W)								5F	6F
Fastech Stepping motor	EzM-28	0G	1G	2G						
	EzM-42		1H	2H	3H	3H	4H	4H		
	EzM-56				3I	3I	4I	4I		
	EzM-60				3J	3J	4J	4J		
Oriental Motor Stepping motor	PK22	0G	1G	2G						
	PK24		1H	2H	3H	3H	4H	4H		
	PK26(Standard)				3I	3I	4I	4I		
	RK54		1H	2H	3H	3H	4H	4H		
	RK56				3J	3J	4J	4J		
	RK59								5K	6K

The dimension of intermediate flange

KM15

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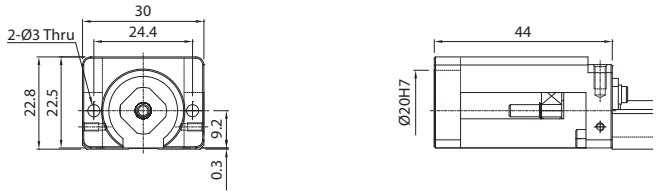

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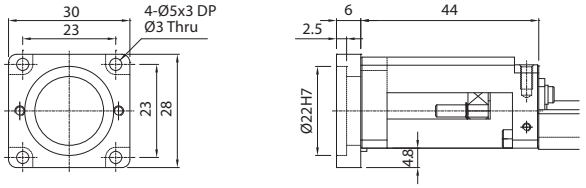

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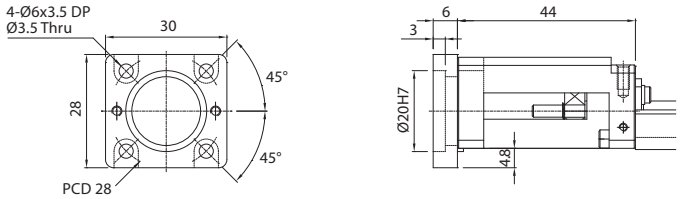

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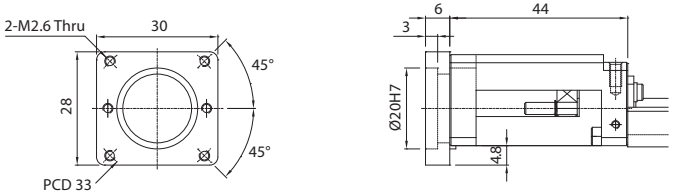

KM20

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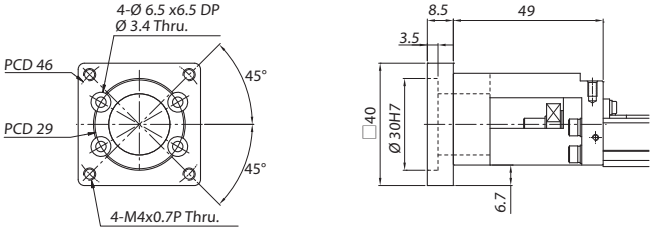
1A



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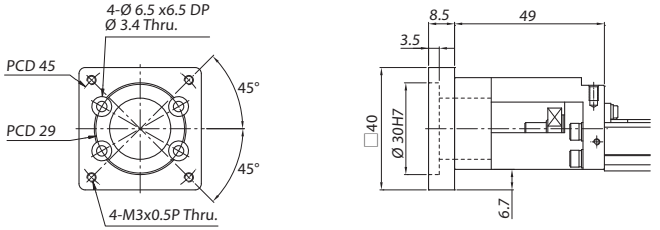

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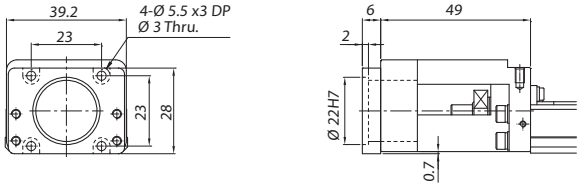

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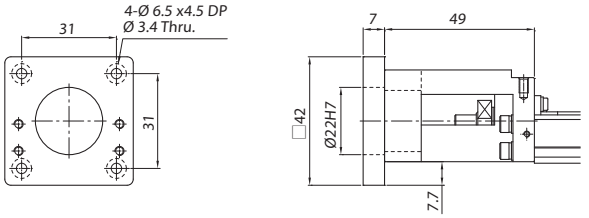
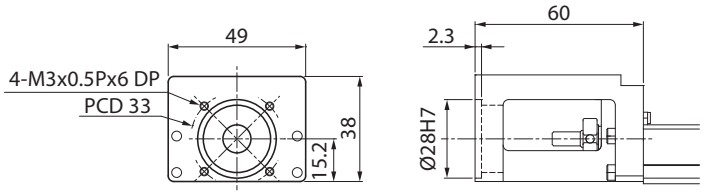


SBN Wälzlager
Passt. Genau.

SBN Wälzlager
Passt. Genau.

KM26

20



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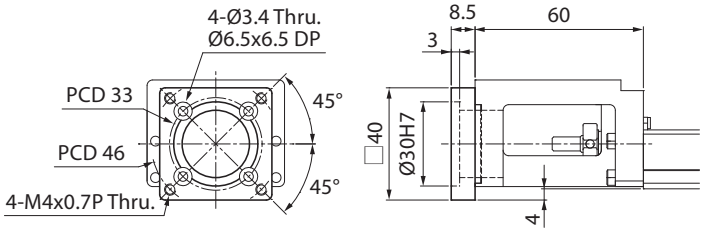

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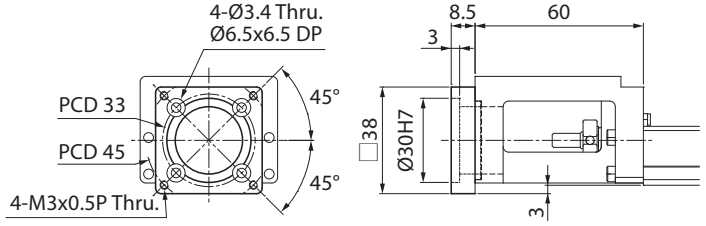

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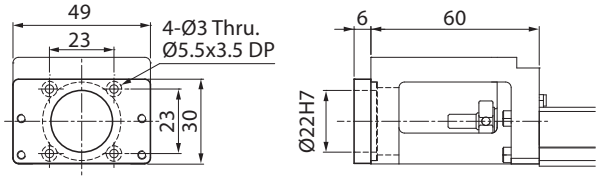

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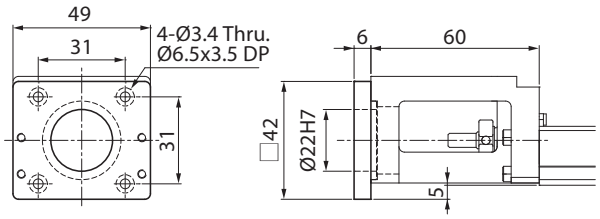

SBN Wälzlager
Passt. Genau.

KM30

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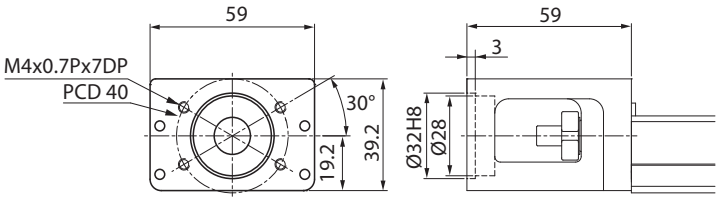

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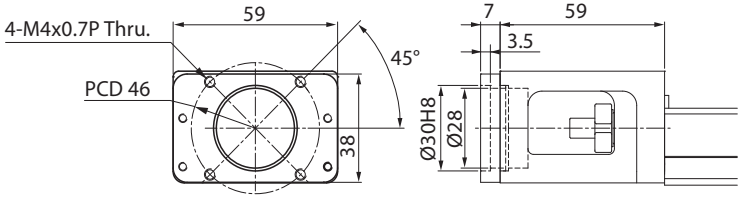

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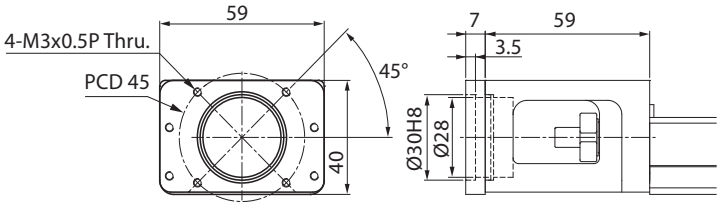

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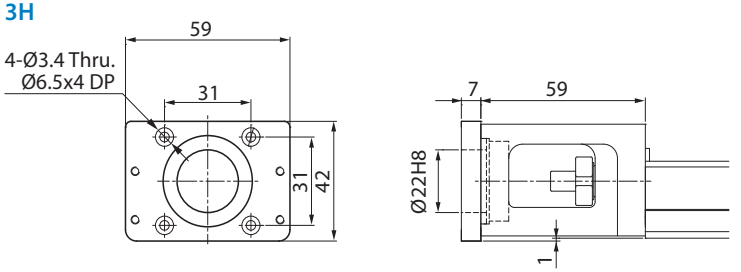

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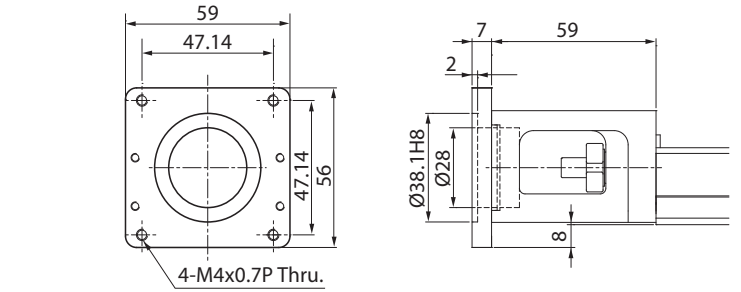

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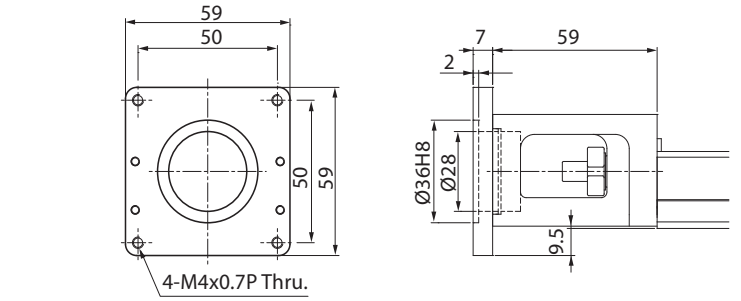

SBN Wälzlager
Passt. Genau.

KM33

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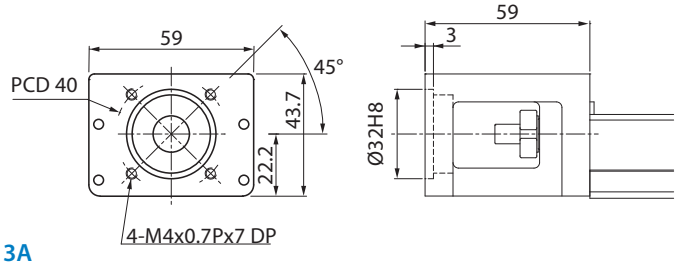

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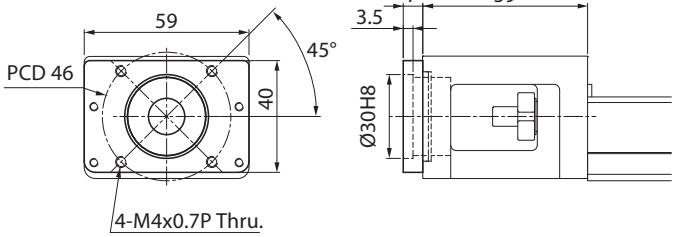

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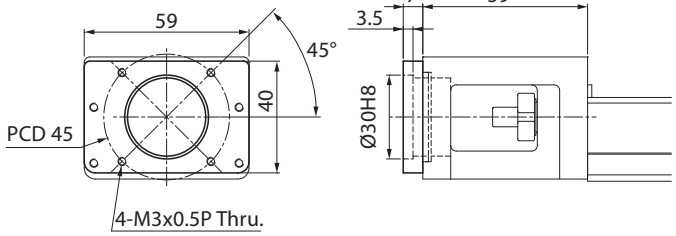

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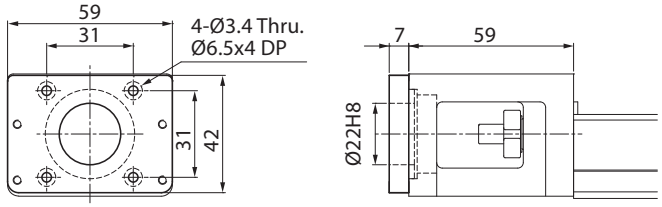

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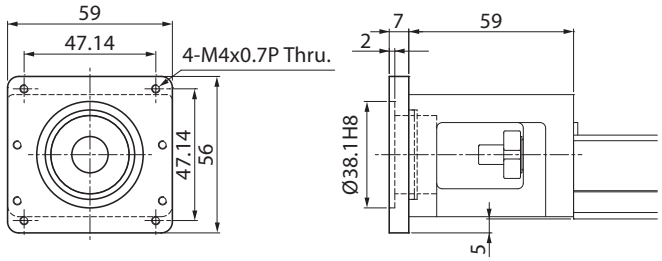

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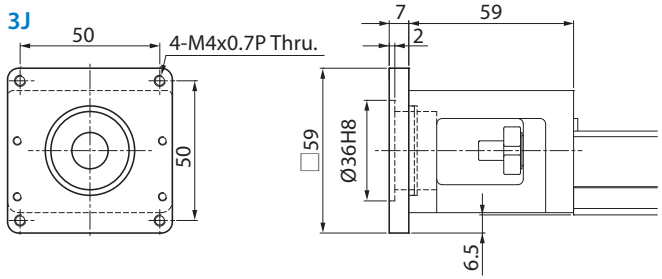

SBN Wälzlager
Passt. Genau.

KM45

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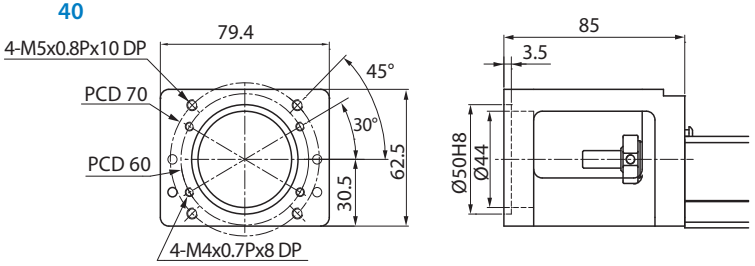

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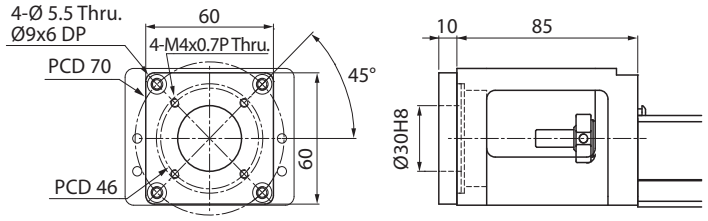

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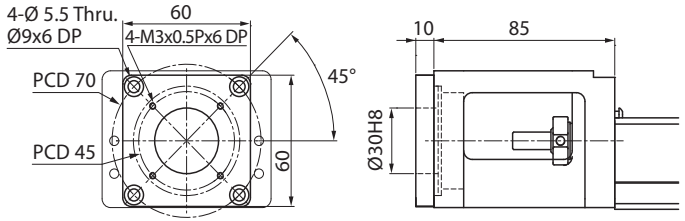

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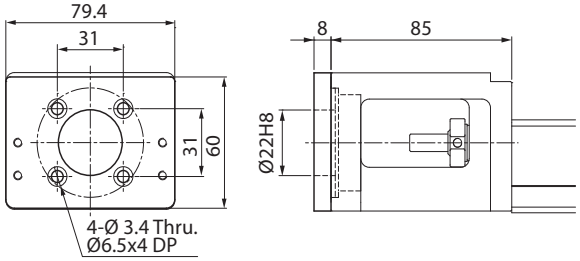

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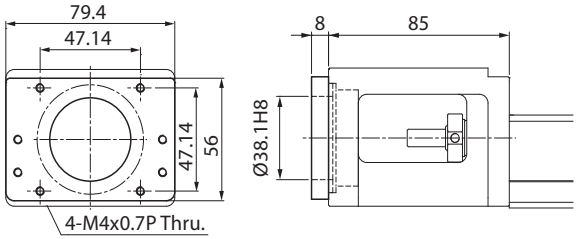

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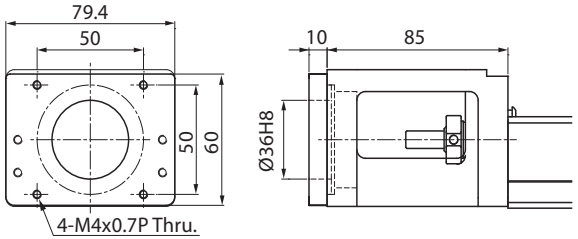

SBN Wälzlager
Passt. Genau.

KM46

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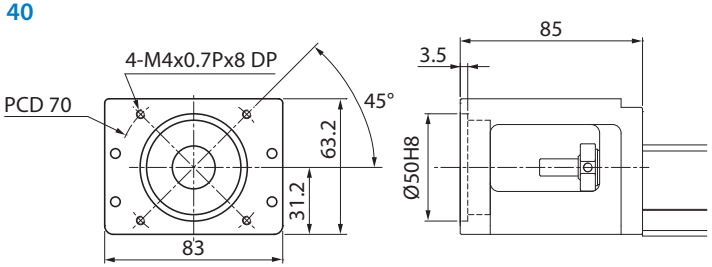

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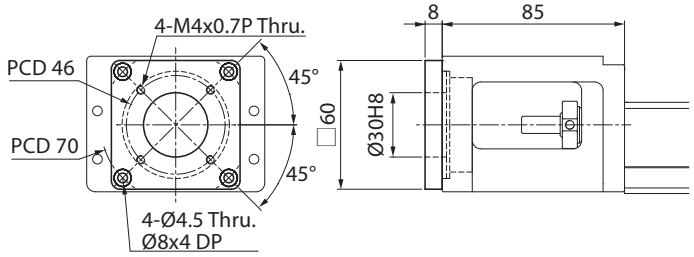

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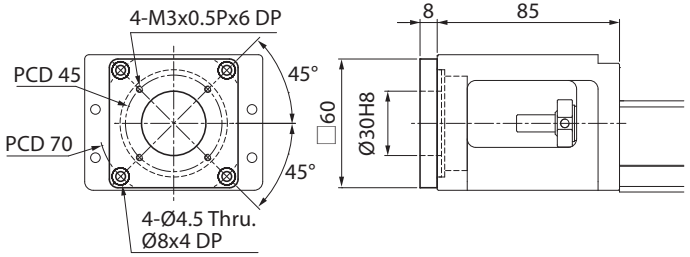

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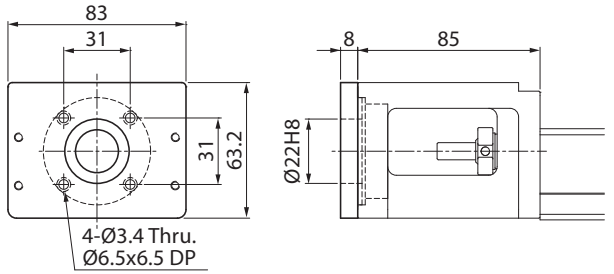

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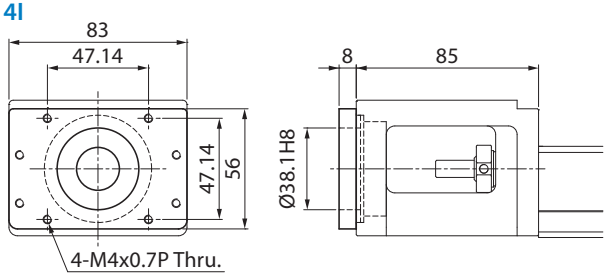

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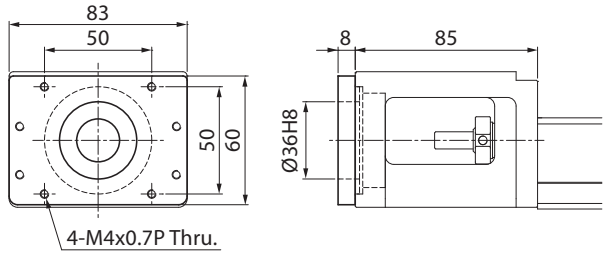

SBN Wälzlager
Passt. Genau.

KM55

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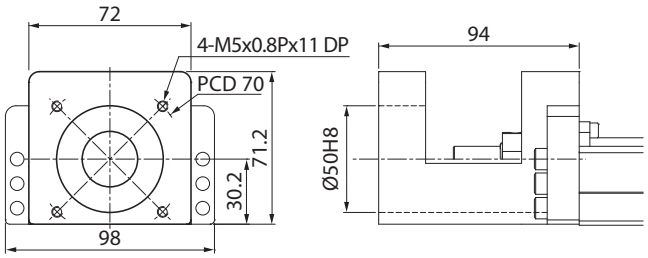

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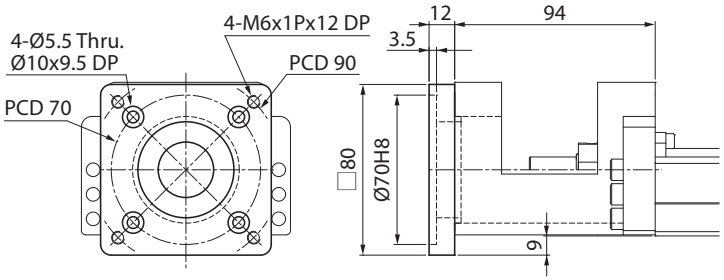

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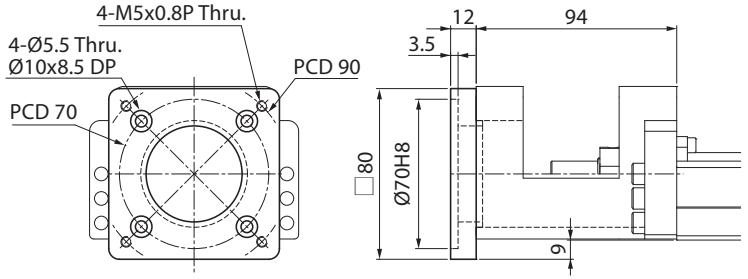
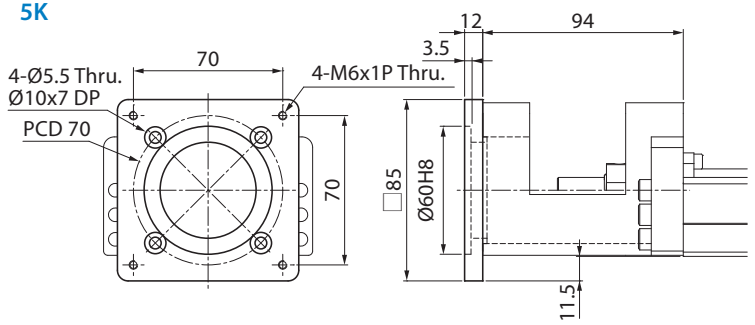


5K



SBN Wälzlager
Passt. Genau.

KM65

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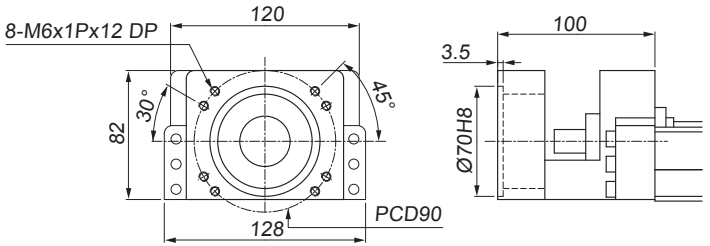

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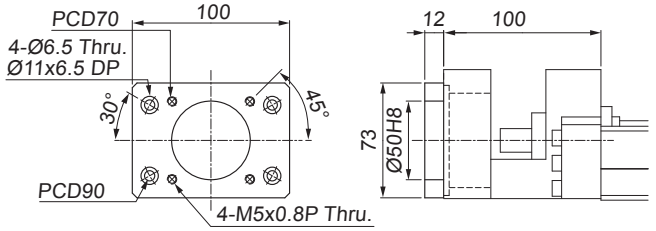

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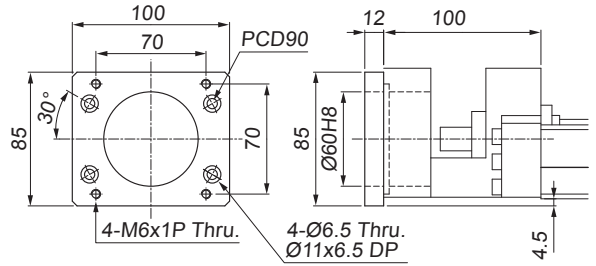

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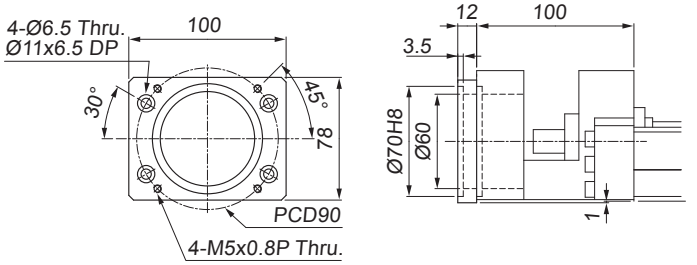

6G