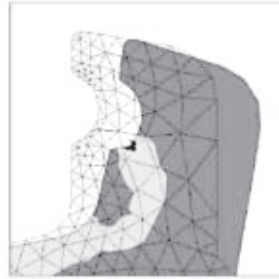


# Single Axis Robot

## KK Series

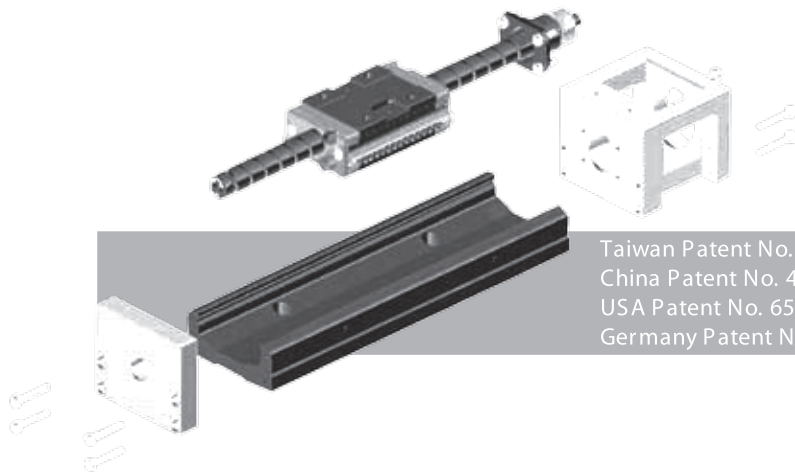
### 1.1 Features

- An integrated system
- Easy installation and maintenance
- Compact and lightweight
- High accuracy
- High stiffness
- Complete selection of accessories for most applications.

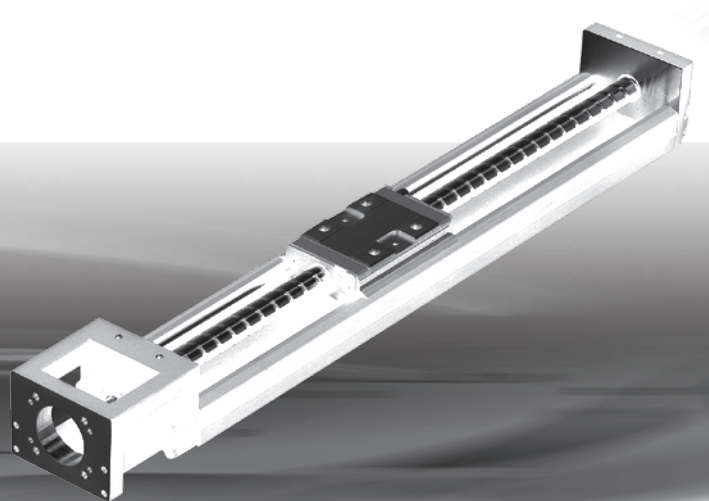


Caption: FEM Analysis

The KK Single Axis Robot features a slider actuated by a motor-driven ballscrew and guided by a linear guideway with a U-shape rail. The slider acts as the ballscrew's nut and the guideway's block.

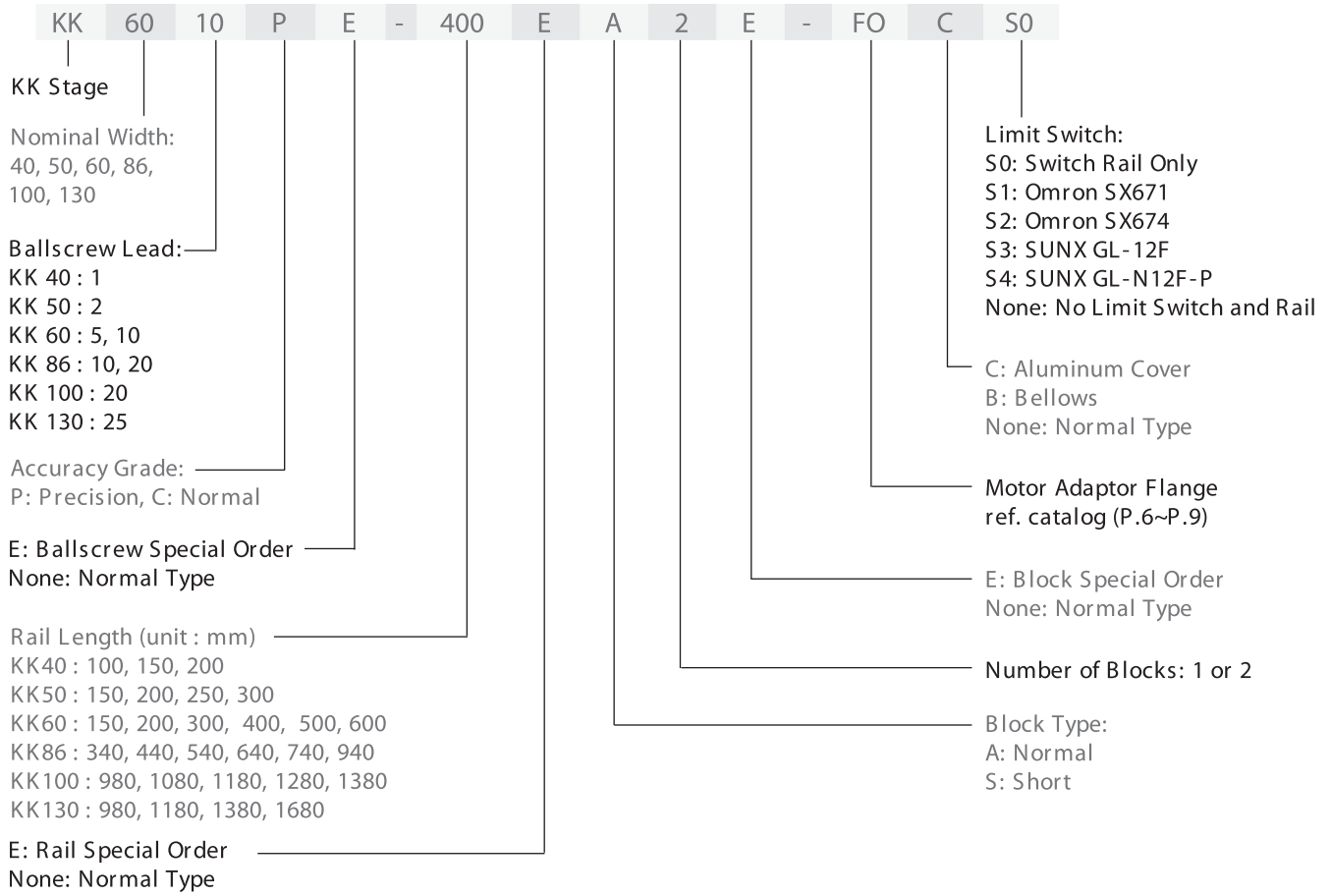


Taiwan Patent No. 183022  
China Patent No. 481446  
USA Patent No. 6584868  
Germany Patent No. 20117489.8



## 1.2 Model Number of KK Series

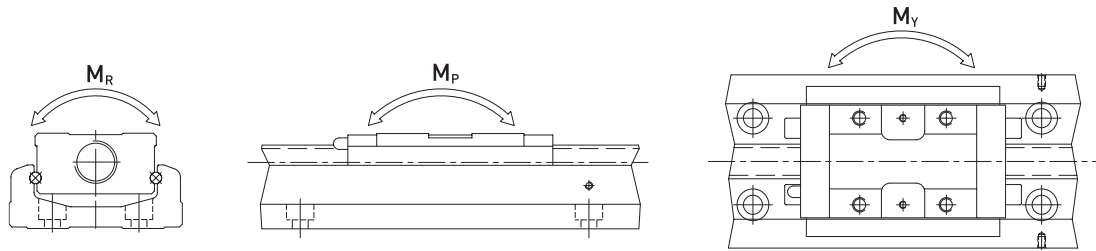
Example: KK6010P-E-400-EA2E-FOCS0



### 1.3 Maximum Speed Limit

Model	Ballscrew Lead (mm)	Rail Length (mm)	Speed (mm/sec)	
			Precision	Normal
KK40	01	100	190	190
		150	190	190
		200	190	190
KK50	02	150	270	270
		200	270	270
		250	270	270
		300	270	270
KK60	05	150	550	390
		200	550	390
		300	550	390
		400	550	390
		500	550	390
		600	340	340
	10	150	1100	790
		200	1100	790
		300	1100	790
		400	1100	790
		500	1100	790
		600	670	670
KK86	10	340	740	520
		440	740	520
		540	740	520
		640	740	520
		740	740	520
		940	610	430
	20	340	1480	1050
		440	1480	1050
		540	1480	1050
		640	1480	1050
		740	1480	1050
		940	1220	870
KK100	20	980	1120	800
		1080	980	800
		1180	750	750
		1280	510	630
		1380	440	530
KK130	25	980	1120	800
		1180	1120	800
		1380	830	800
		1680	550	550

### 1.4 Specifications



Model No.		Ballscrew				Guideway															
		Nominal Diameter (mm)	Lead (mm)	Basic Dynamic Load (N)	Basic Static Load (N)	Basic Dynamic Load Rating (N)		Basic Static Load Rating (N)		Static Rated Moment											
						Block A	Block S	Block A	Block S	Allowable Static Moment $M_p$ (N-m) (pitching)				Allowable Static Moment $M_y$ (N-m) (yawing)				Allowable Static Moment $M_r$ (N-m) (rolling)			
										Block A1	Block A2	Block S1	Block S2	Block A1	Block A2	Block S1	Block S2	Block A1	Block A2	Block S1	Block S2
KK40	Precision	8	1	735	1538	3920	-	6468	-	33	182	-	-	33	182	-	-	81	162	-	-
	Normal			676	1284	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KK50	Precision	8	2	2136	3489	8007	-	12916	-	116	278	-	-	116	278	-	-	222	444	-	-
	Normal			1813	2910	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KK60	Precision	12	5	3744	6243	13230	7173	21462	11574	152	348	72	205	152	348	72	205	419	838	241	482
	Normal			3377	5625	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KK60	Precision	12	10	2410	3743	13230	7173	21462	11574	152	348	72	205	152	348	72	205	419	838	241	482
	Normal			2107	3234	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KK86	Precision	15	10	7144	12642	31458	21051	50764	29475	622	3050	166	1309	622	3050	166	1309	1507	3014	847	1694
	Normal			6429	11387	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KK86	Precision	15	20	4645	7655	31458	21051	50764	29475	622	3050	166	1309	622	3050	166	1309	1507	3014	847	1694
	Normal			4175	6889	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KK100	Precision	20	20	7046	12544	39200	-	63406	-	960	4763	-	-	960	4763	-	-	2205	4410	-	-
	Normal			4782	9163	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KK130	Precision	25	25	7897	15931	48101	-	84829	-	1536	7350	-	-	1536	7350	-	-	3885	7770	-	-
	Normal			7092	14352	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



## 1.5 Accuracy Grade

Unit : mm

Model	Rail Length	Repeatability		Accuracy		Running Parallelism		Starting Torque(N-cm)	
		Precision	Normal	Precision	Normal	Precision	Normal	Precision	Normal
KK40	100	± 0.003	± 0.01	0.020	-	0.010	-	1.2	0.8
	150								
	200								
KK50	150	± 0.003	± 0.01	0.020	-	0.010	-	4	2
	200								
	250								
	300								
KK60	150	± 0.003	± 0.01	0.020	-	0.010	-	15	7
	200								
	300								
	400								
	500	± 0.003	± 0.01	0.025	-	0.015	-	15	7
	600								
KK86	340	± 0.003	± 0.01	0.025	-	0.015	-	15	10
	440								
	540								
	640								
	740	± 0.003	± 0.01	0.030	-	0.020	-	17	10
	940								
KK100	980	± 0.005	± 0.01	0.035	-	0.025	-	17	12
	1080								
	1180	± 0.005	± 0.01	0.040	-	0.03	-	20	12
	1280			0.045		0.035		23	
	1380			0.05		0.04		25	
KK130	980	± 0.005	± 0.01	0.035	-	0.025	-	25	15
	1180			0.04		0.03		25	
	1380								
	1680			± 0.007		± 0.012		0.05	

## 1.6 Motor and Motor Adaptor Flange

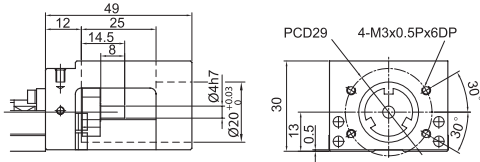
### 1.6.1 Motor and Motor Adaptor Flange

Motor		Model	KK40	KK50	KK60	KK86	KK100	KK130	
AC Servo Motor	HIWIN	FBAC102(200W)				F0	F0	F1	
		FBAC104(400W)							
	Panasonic	MSM3AZ(30W)							
		MSM5AZ(50W)	F2	F2	F2	F3			
		MSM01(100W)							
		MSM02(200W)				F1			
		MSM04(400W)							
		MSM08(750W)				F4	F2	F4	
	MHI	HC-PQ033(30W)							
		HC-PQ053(50W)	F1	F1	F1	F2			
		HC-PQ13(100W)							
		HC-KFS053(50W)	F1	F1	F1	F2			
		HC-KFS13(100W)							
		HC-KFS23(200W)					F0	F0	F1
		HC-KFS43(400W)							
		HC-MF73(750W)					F1	F2	
	Yaskawa	SGMAH-A3(30W)			F1	F1	F2		
		SGMAH-A5(50W)							
		SGMAH-01(100W)							
		SGMPH-01(100W)							
SGMAH-02(200W)						F0	F0	F1	
SGMAH-04(400W)									
SGMPH-02(200W)								F0	
SGMPH-04(400W)									
	SGMAH-08(750W)					F1	F2		
Nema17			F3	F3	F5				
Nema23				(F-E2)	F4	F6			
Nema34							F4		
Stepping Motor	HIWIN	FRST40-21	F3	F3	F5				
		FRST55-21	F3	F3	F5				
		FRST55-25	F3	F3	F5				
		FRST55-23	F3	F3	F5				
	VEXTA	PK24	F3	F3	F5				
		PK26		(F-E2)	F4	F6			
		PK29					F4	F3	
		PK54		F3	F5				
		PK56		(F-E1)		F5			
		PK59					F3		
	Nema17			F3	F3	F5			
	Nema23				(F-E2)	F4	F6		
	Nema34						F4		

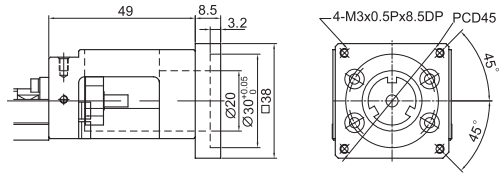
## 1.6.2 Motor housing and Motor adaptor Flange

### KK40

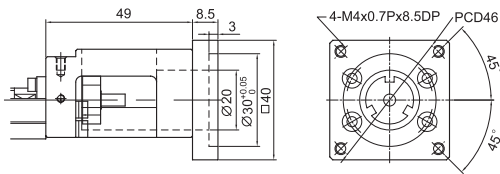
Motor housing F0



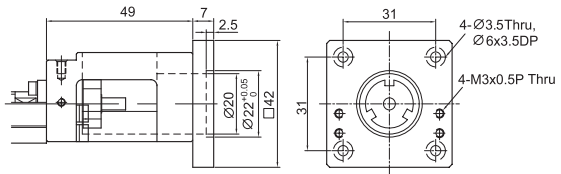
Motor adaptor Flange F2



Motor adaptor Flange F1

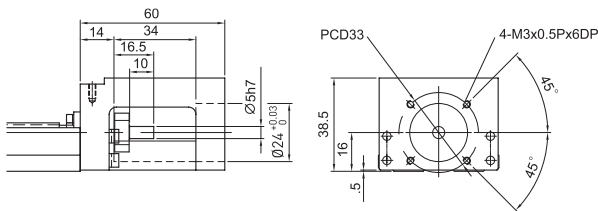


Motor adaptor Flange F3

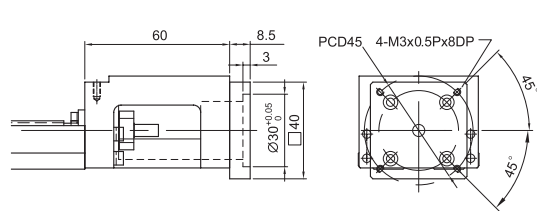


### KK50

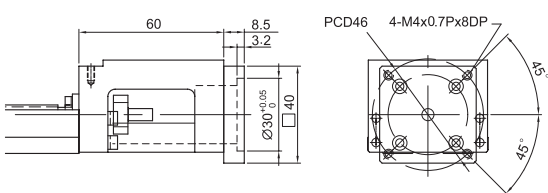
Motor housing F0



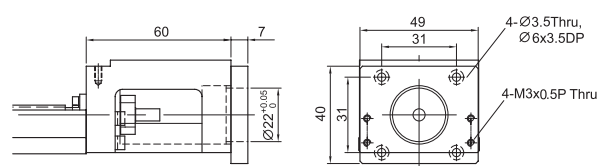
Motor adaptor Flange F2



Motor adaptor Flange F1

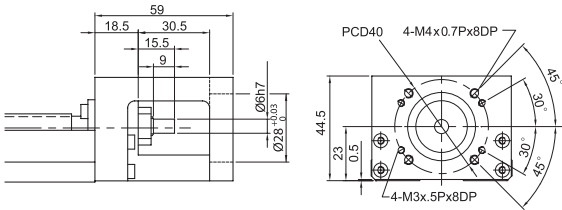


Motor adaptor Flange F3

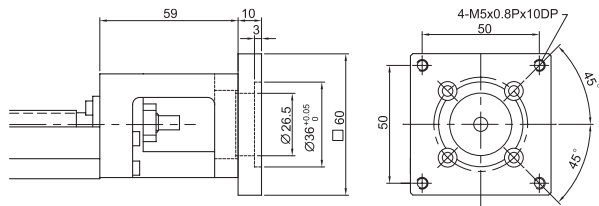


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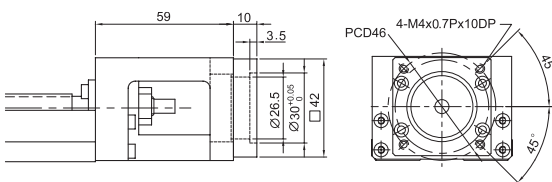
Motor housing F0



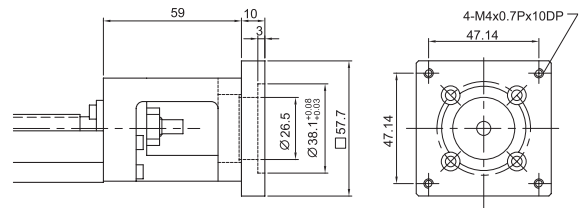
Motor adaptor Flange F3



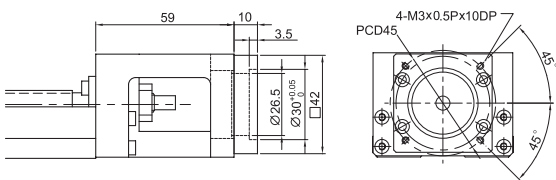
Motor adaptor Flange F1



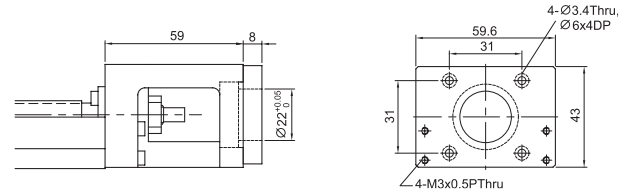
Motor adaptor Flange F4



Motor adaptor Flange F2

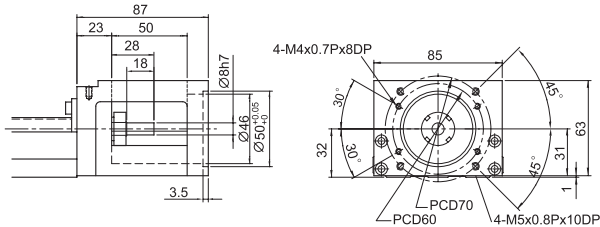


Motor adaptor Flange F5

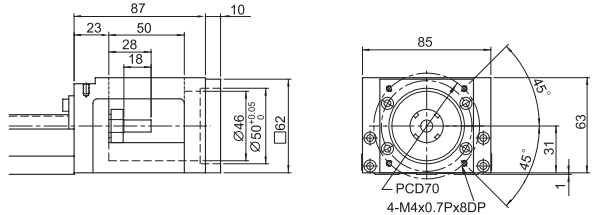


### KK86

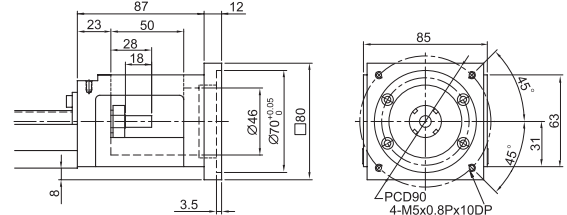
Motor housing F0



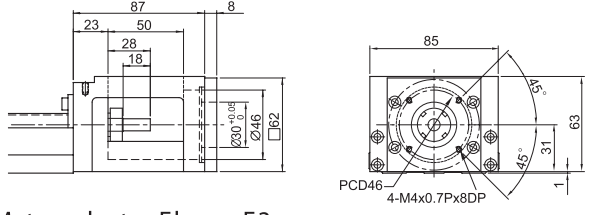
Motor adaptor Flange F1



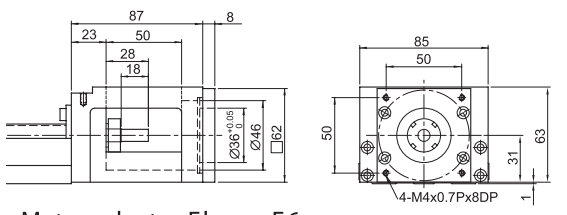
Motor adaptor Flange F4



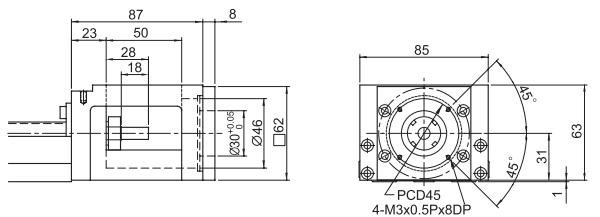
Motor adaptor Flange F2



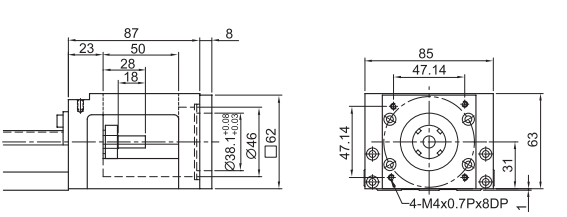
Motor adaptor Flange F5



Motor adaptor Flange F3

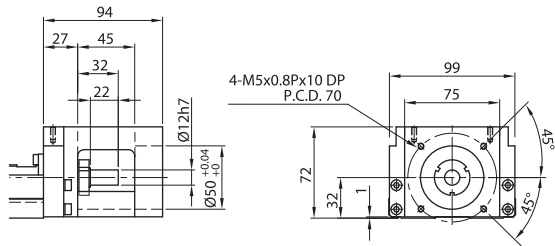


Motor adaptor Flange F6

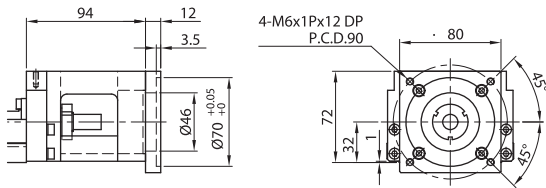


## KK100

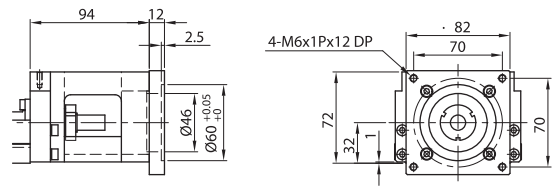
Motor housing F0



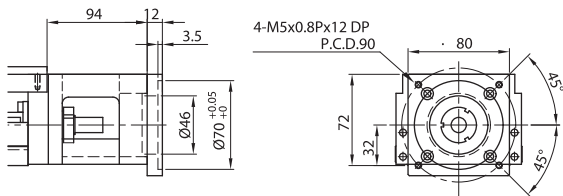
Motor adaptor Flange F1



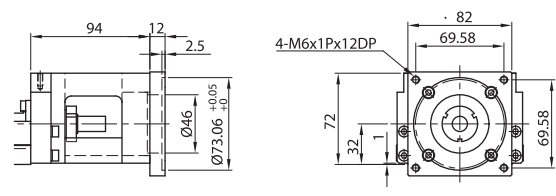
Motor adaptor Flange F3



Motor adaptor Flange F2

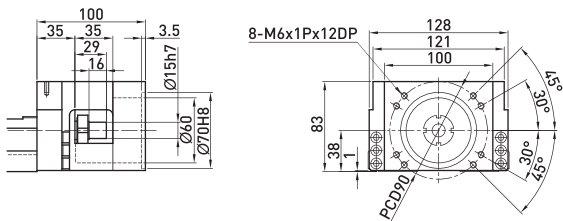


Motor adaptor Flange F4

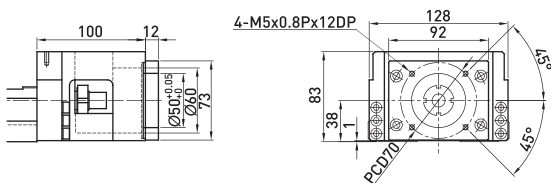


## KK130

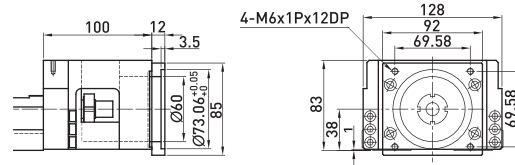
Motor housing F0



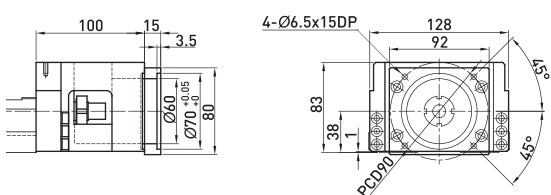
Motor adaptor Flange F1



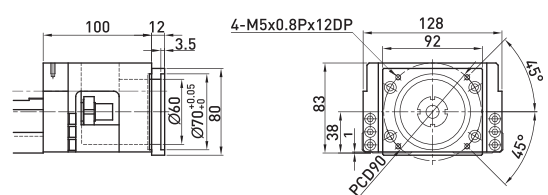
Motor adaptor Flange F3



Motor adaptor Flange F2

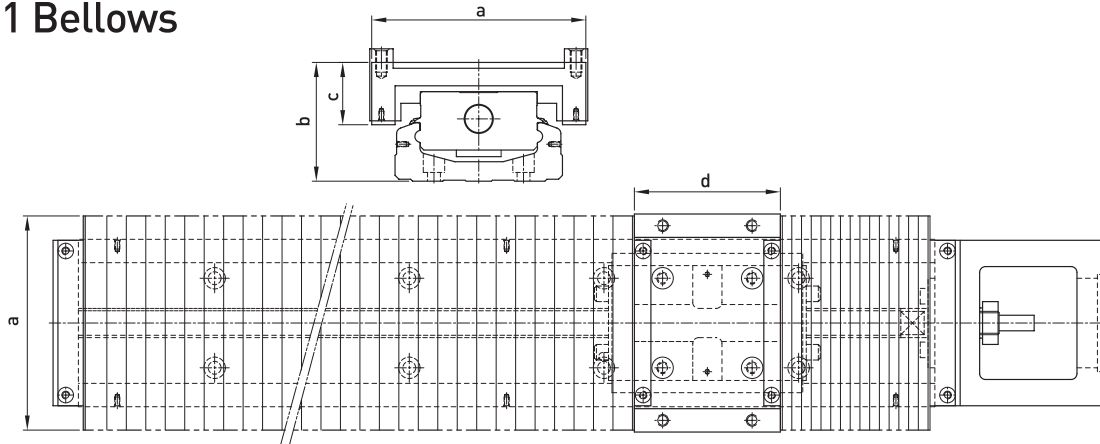


Motor adaptor Flange F4



## 1.7 Optional Accessories

### 1.7.1 Bellows

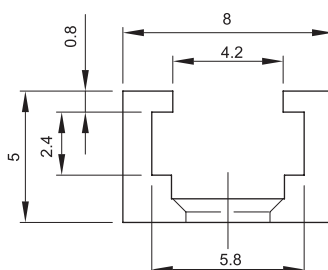


Unit : mm

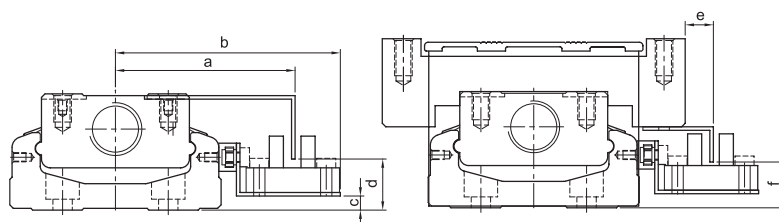
Nominal Width	Rail Length	Stroke	Min.	Max.	a	b	c	d
KK40	100	35	16	51	60	29.5	19	33
	150	63	27	90				
	200	93	37	130				
KK50	150	60	21.5	81.5	62	37	19	47
	200	95	29	124				
	250	130	36.5	166.5				
	300	160	46.5	206.5				
KK60	150	56	16	80	84	45.5	24	54
	200	106	20	126				
	300	166	40	206				
	400	234	56	290				
	500	306	70	376				
	600	366	90	456				
KK86	340	188	36	224	110	61	32	75
	440	260	50	310				
	540	336	62	398				
	640	408	76	484				
	740	480	90	570				
	940	640	110	750				
KK100	980	769	58	827	150	73	41	95
	1080	855	65	920				
	1180	945	70	1015				
	1280	1029	78	1107				
	1380	1115	85	1200				
KK130	980	748	62	810	180	89	53	108
	1180	916	78	994				
	1380	1084	94	1178				
	1680	1346	113	1459				

## 1.7.2 Switch

Switch rail

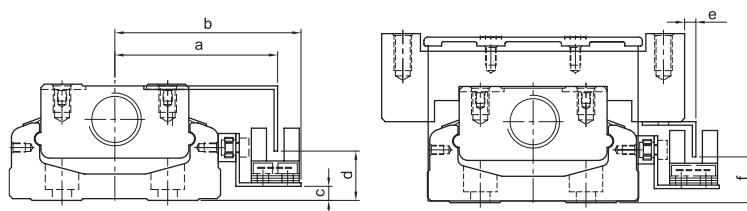


Switch



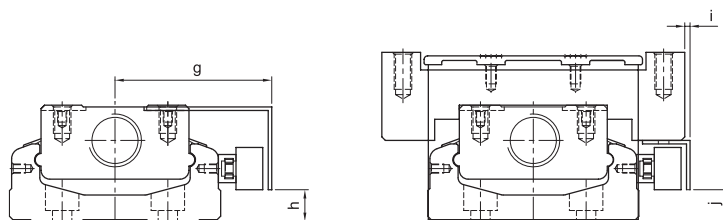
Nominal Width	a	b	c	d	e	f
KK40	41.5	54.1	0.5	10.8	15.3	12
KK50	45.5	59	1	10	15	11
KK60	51	63.8	4	14.5	8	13
KK86	63.5	76.7	8	18	8	18
KK100	71	84	10	20	9	20
KK130	85.5	98.5	14	24	0.5	23

Switch 1 : Omron EE-SX671



Nominal Width	a	b	c	d	e	f
KK40	36.5	44.3	1	9.8	10.5	12
KK50	41.3	48	1	10.5	10.2	11
KK60	46.2	52.8	4	14	3.2	13
KK86	59	65.7	8	18	3	18
KK100	66	73	10	20	4.2	20
KK130	80.8	87.5	14	23.5	-4.1	23.5

Switch 2 : Omron EE-SX674



Nominal Width	g	h	i	j
KK40	40	5.5	13.5	5.5
KK50	39.5	5.7	7	19.5
KK60	44.5	9	2	9
KK86	57	13	1	13
KK100	64.5	15	2.5	15
KK130	79	19	-6	19

Switch 3, 4 : SUNX GL-12F, GL-N12F-P

## 1.8 Life Calculations

The three main components of the KK Single Axis Robot are the guideway, ballscrew, and bearing. The calculation formulas of their life are shown as follows:

### 1.8.1 Guideway

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

$L$  : Life Rating (km)       $C$  : Basic Dynamic Load Rating (N)  
 $f_t$  : Contact Coefficient (ref. Table 1)       $P_n$  : Calculated Loading (N)  
 $f_w$  : Loading Coefficient (ref. Table 2)

Table 1

Block type	Contact Coefficient $f_t$
A1, S1	1.0
A2, S2	0.81

Table 2

Operating Condition		Loading Coefficient $f_w$
Thrust and Vibration	Velocity (V)	
No Thrust	V? 15m/min	1.0 ~ 1.5
Low Vibration	15m/min? V? 60m/min	1.5 ~ 2.0
High Vibration	V? 60m/min	2.0 ~ 3.5

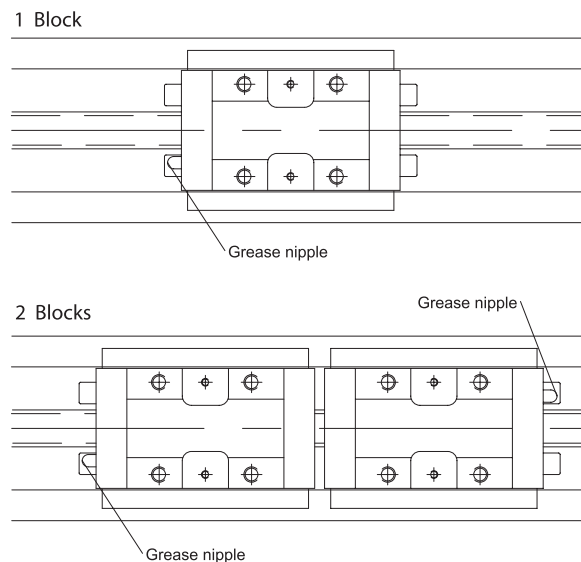
### 1.8.2 Ballscrew and Bearing

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

$L$  : Life Rating (rev.)       $C_a$  : Basic Dynamic Load Rating (N)  
 $f_w$  : Loading Coefficient (ref. Table 2)       $P_{a,n}$  : Axial Loading (N)

## 1.9 Lubrication

Replenishing the grease every 100km

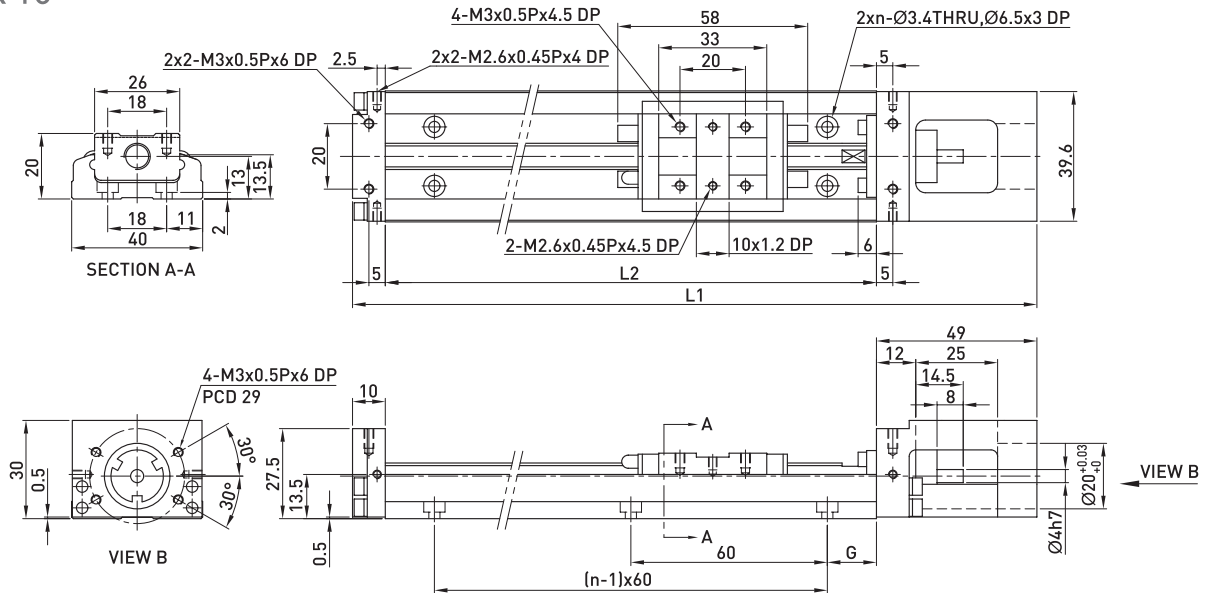




## 1.10 Dimension

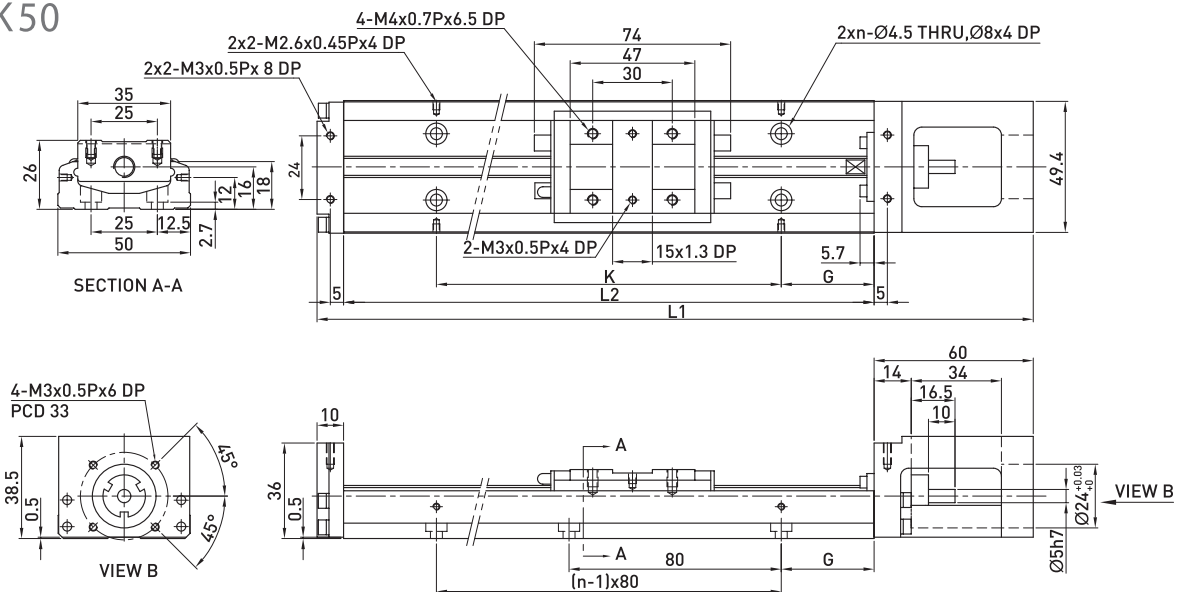
### 1.10.1 Without cover

#### KK40



Rail Length L2 (mm)	Total Length L1 (mm)	Maximum Stroke (mm)		G (mm)	n	Mass (kg)	
		A1 Block	A2 Block			A1 Block	A2 Block
100	159	36	-	20	2	0.48	-
150	209	86	34	15	3	0.6	0.67
200	259	136	84	40	3	0.72	0.79

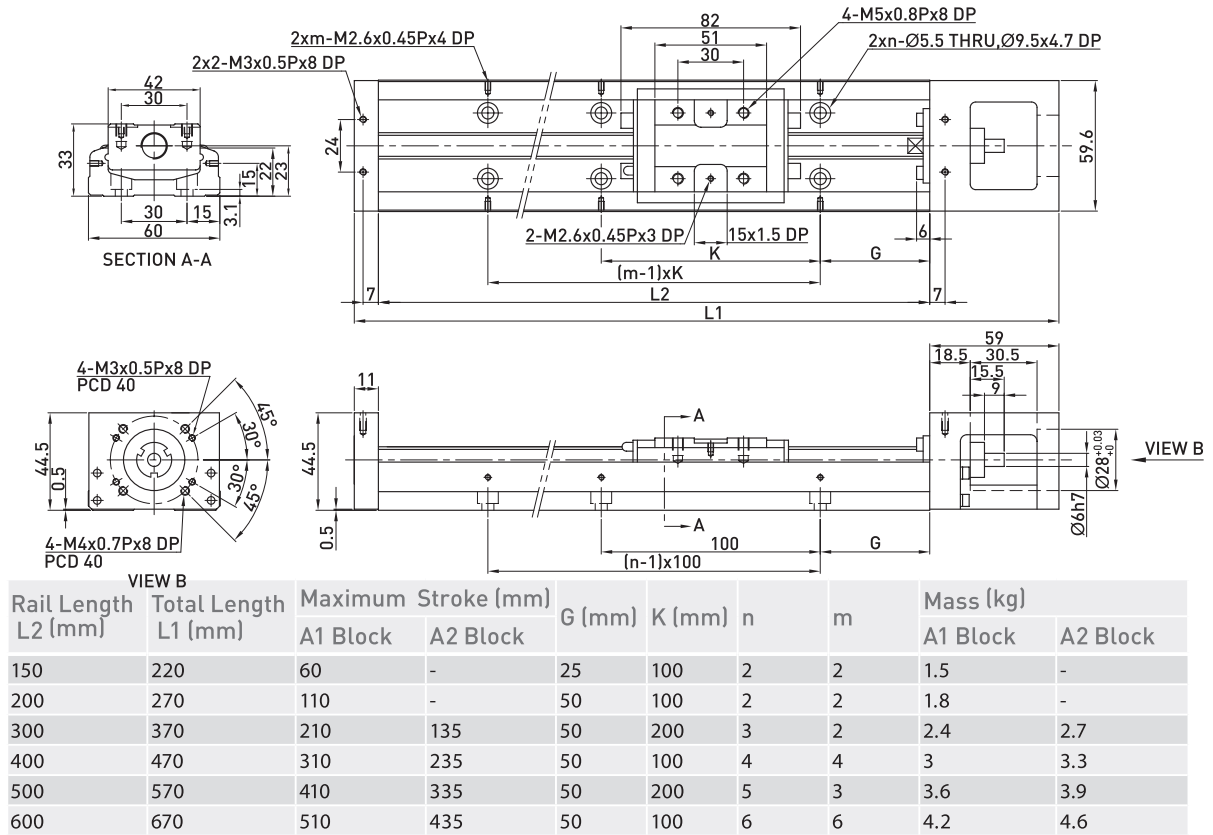
#### KK50



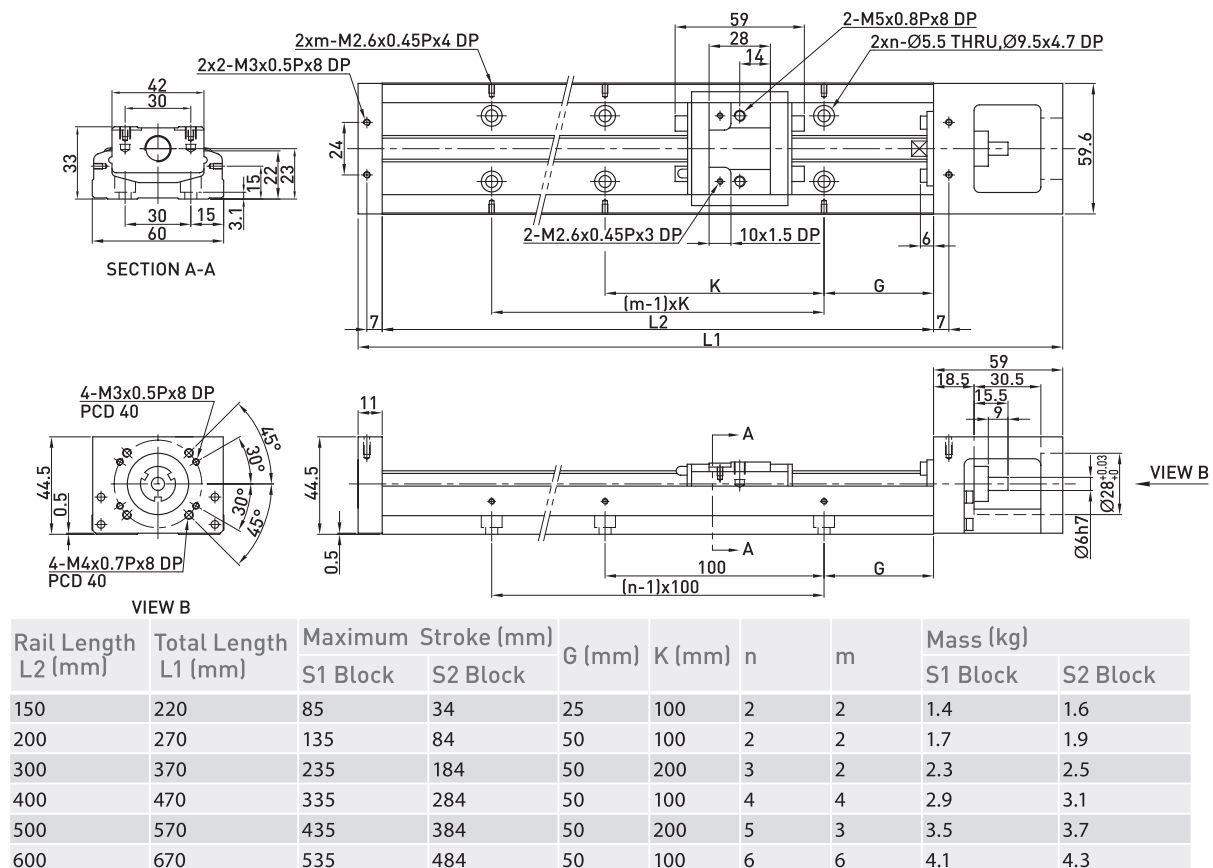
Rail Length L2 (mm)	Total Length L1 (mm)	Maximum Stroke (mm)		G (mm)	K (mm)	n	Mass (kg)	
		A1 Block	A2 Block				A1 Block	A2 Block
150	220	70	-	35	80	2	1	-
200	270	120	55	20	160	3	1.2	1.4
250	320	170	105	45	160	3	1.4	1.6
300	370	220	155	30	240	4	1.6	1.8

# Single Axis Robot

## KK60 (Standard)

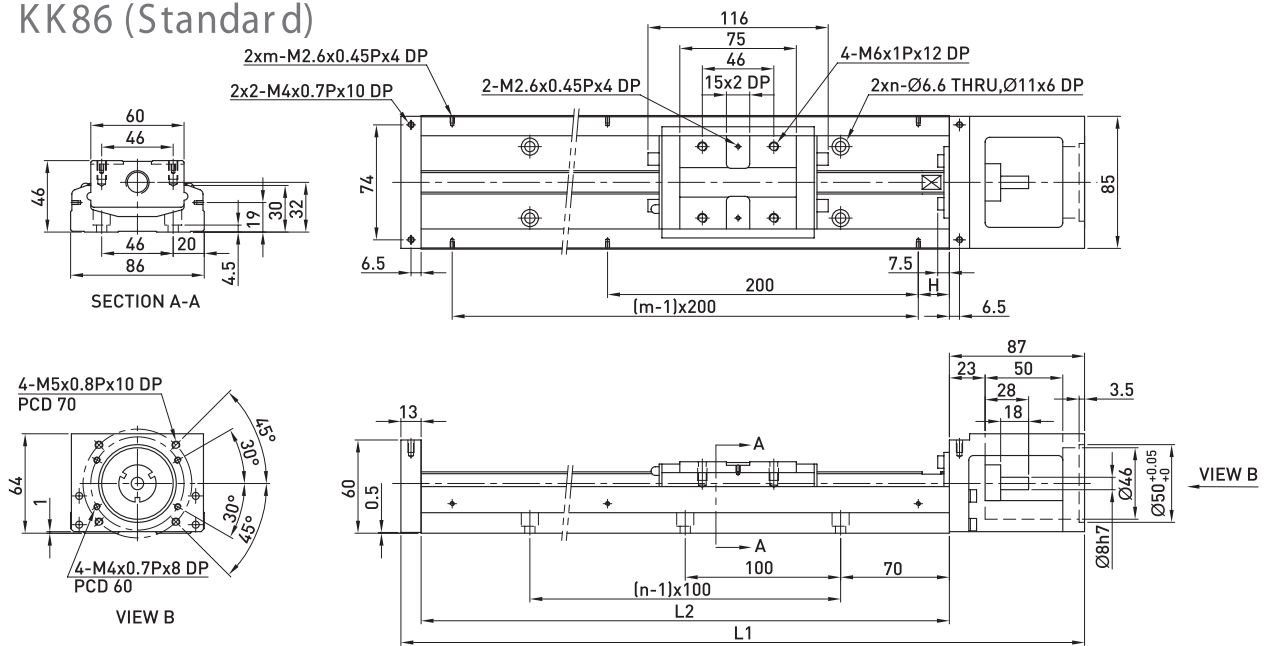


## KK60 (Light Duty)



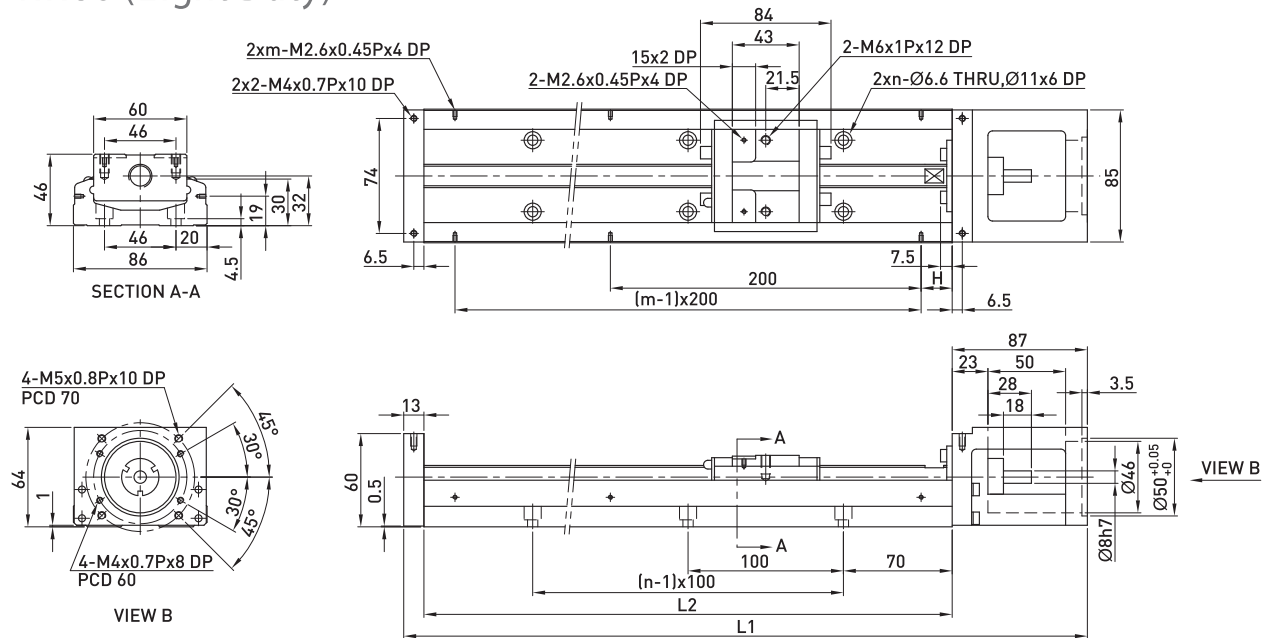
# Single Axis Robot

## KK86 (Standard)



Rail Length L2 (mm)	Total Length L1 (mm)	Maximum Stroke (mm)		H (mm)	n	m	Mass (kg)	
		A1 Block	A2 Block				A1 Block	A2 Block
340	440	210	100	70	3	2	5.7	6.5
440	540	310	200	20	4	3	6.9	7.7
540	640	410	300	70	5	3	8.0	8.8
640	740	510	400	20	6	4	9.2	10.0
740	840	610	500	70	7	4	10.4	11.2
940	1040	810	700	70	9	5	11.6	12.4

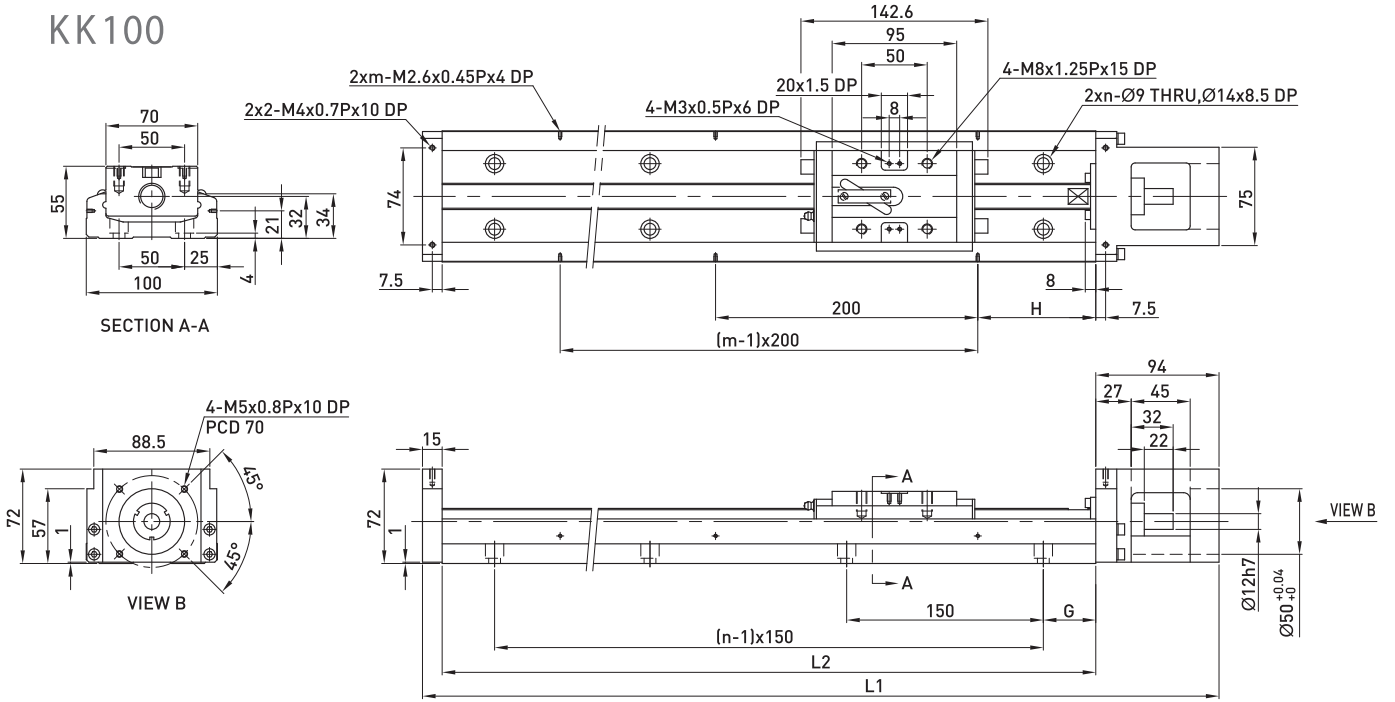
## KK86 (Light Duty)



Rail Length L2 (mm)	Total Length L1 (mm)	Maximum Stroke (mm)		H (mm)	n	m	Mass (kg)	
		S1 Block	S2 Block				S1 Block	S2 Block
340	440	246	170	70	3	2	5.4	5.9
440	540	346	270	20	4	3	6.6	7.1
540	640	446	370	70	5	3	7.7	8.2
640	740	546	470	20	6	4	8.9	9.4
740	840	646	570	70	7	4	10.1	10.6
940	1040	846	770	70	9	5	11.3	11.8

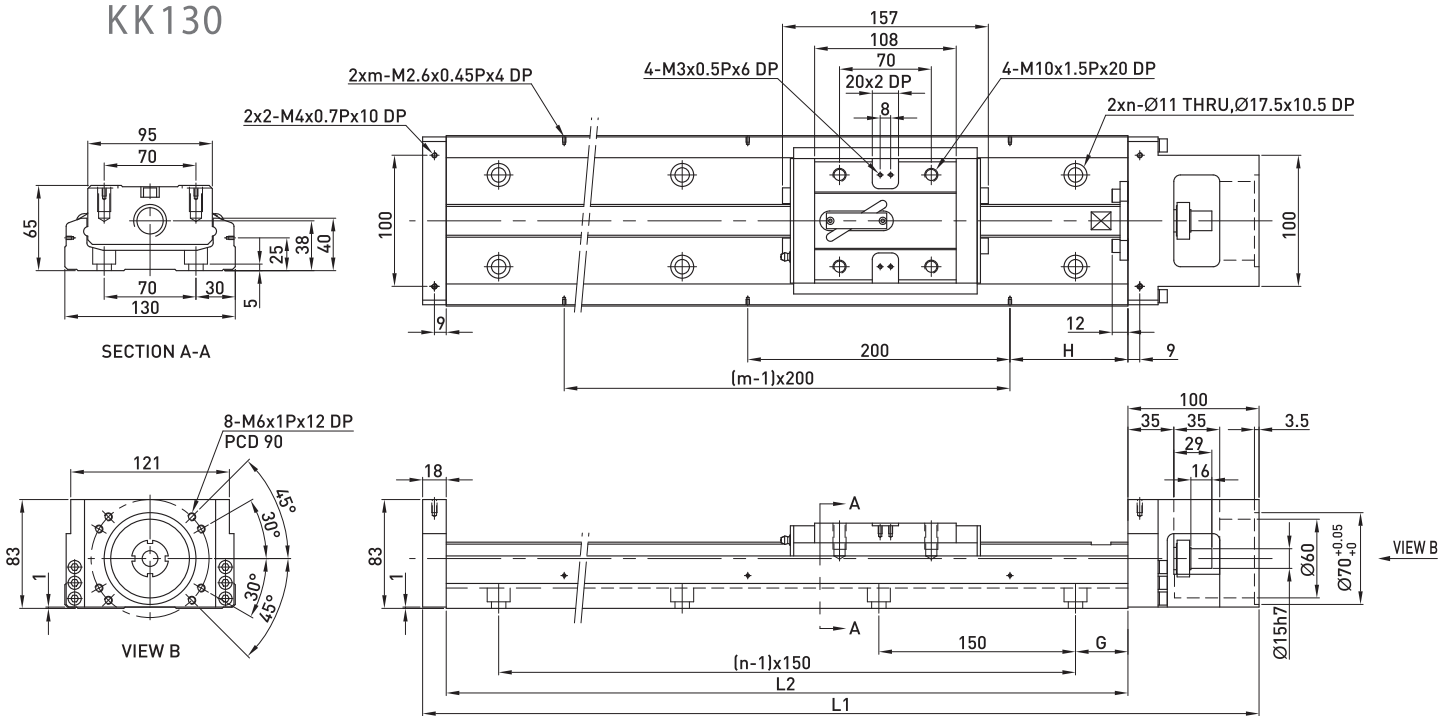
# Single Axis Robot

## KK100



Rail Length L2 (mm)	Total Length L1 (mm)	Maximum Stroke (mm)		G (mm)	H (mm)	n	m	Mass (kg)	
		A1 Block	A2 Block					A1 Block	A2 Block
980	1089	828	700	40	90	7	5	18.6	20.3
1080	1189	928	800	15	40	8	6	20.3	22.0
1180	1289	1028	900	65	90	8	6	22.0	23.7
1280	1389	1128	1000	40	40	9	7	23.6	25.3
1380	1489	1228	1100	15	90	10	7	25.3	27.0

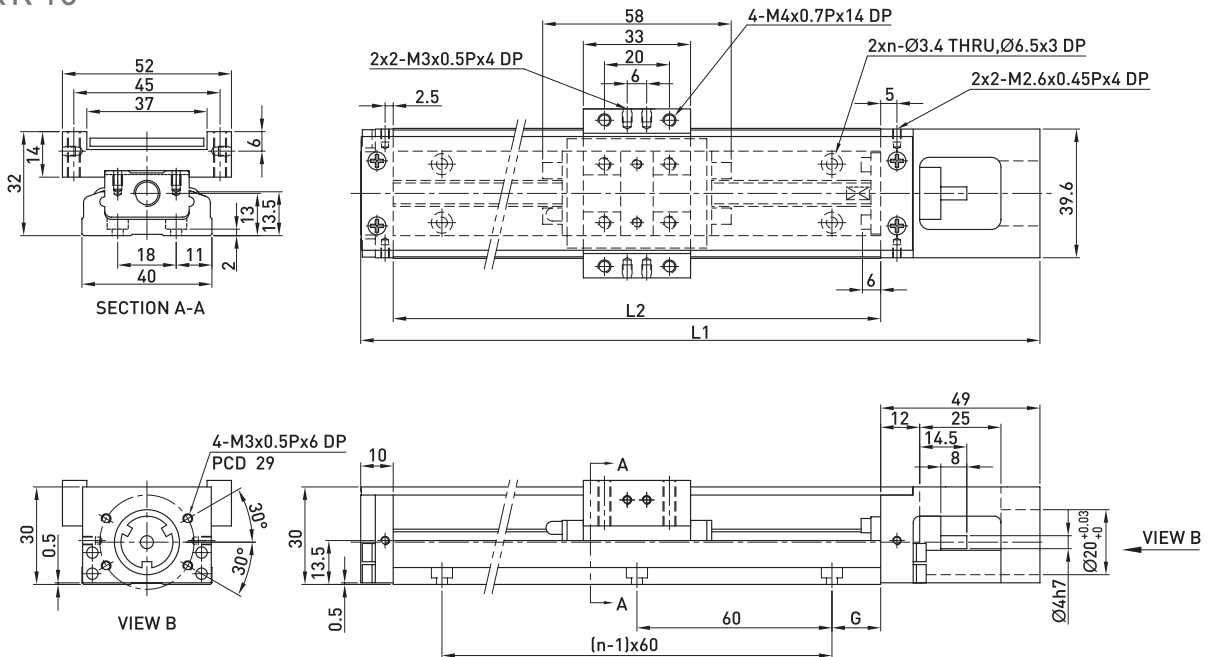
## KK130



Rail Length L2 (mm)	Total Length L1 (mm)	Maximum Stroke (mm)		G (mm)	H (mm)	n	m	Mass (kg)	
		A1 Block	A2 Block					A1 Block	A2 Block
980	1098	811	659	40	90	7	5	29.4	32.3
1180	1298	1011	859	65	90	8	6	34.3	37.2
1380	1498	1211	1059	90	90	9	7	39.2	42.1
1680	1798	1511	1359	90	40	11	9	46.5	49.4

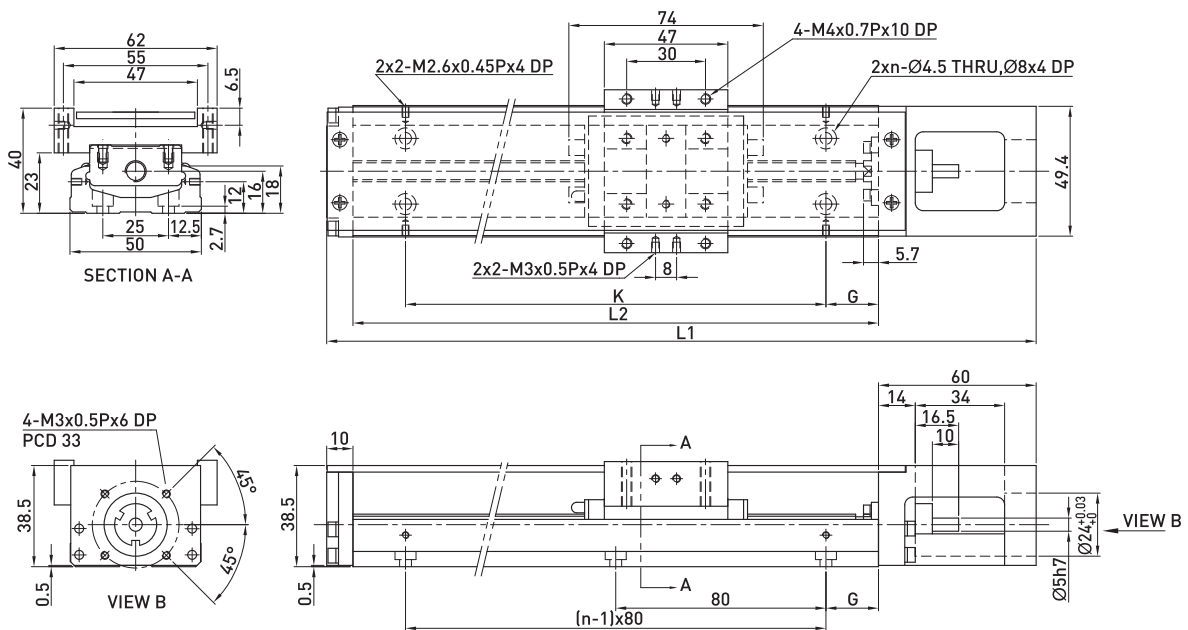
### 1.10.2 With cover

#### KK40



Rail Length L2 (mm)	Total Length L1 (mm)	Maximum Stroke (mm)		G (mm)	n	Mass (kg)	
		A1 Block	A2 Block			A1 Block	A2 Block
100	159	36	-	20	2	0.55	-
150	209	86	34	15	3	0.68	0.76
200	259	136	84	40	3	0.82	0.89

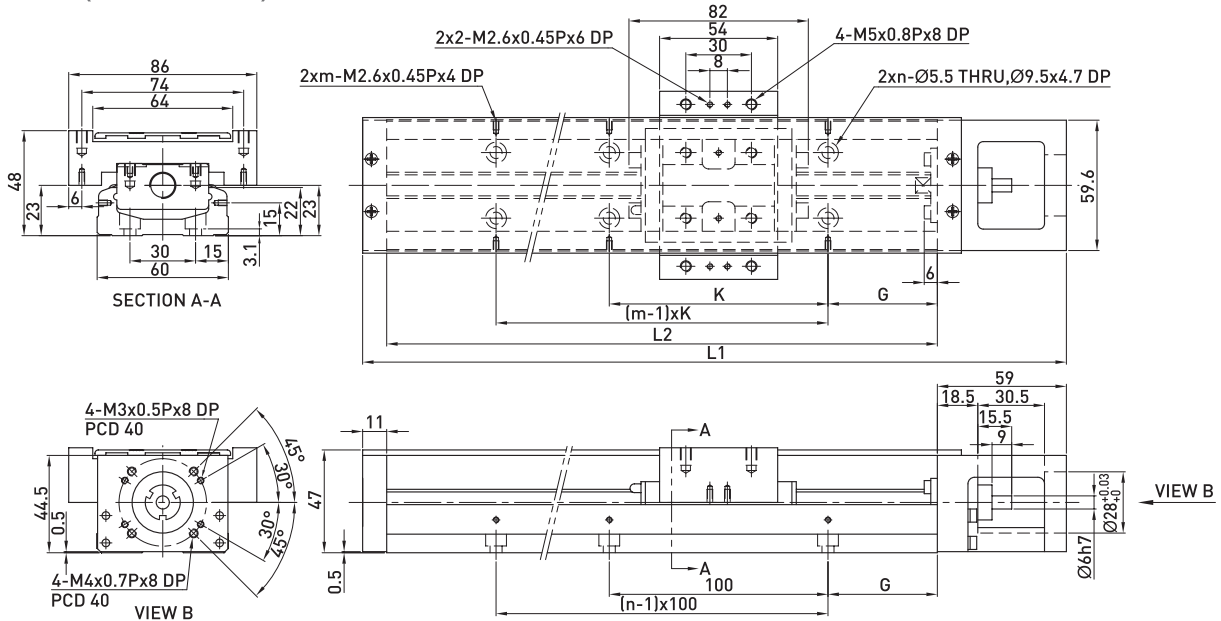
#### KK50



Rail Length L2 (mm)	Total Length L1 (mm)	Maximum Stroke (mm)		G (mm)	K (mm)	n	Mass (kg)	
		A1 Block	A2 Block				A1 Block	A2 Block
150	220	70	-	35	80	2	1.1	-
200	270	120	55	20	160	3	1.3	1.5
250	320	170	105	45	160	3	1.6	1.8
300	370	220	155	30	240	4	1.8	2.0

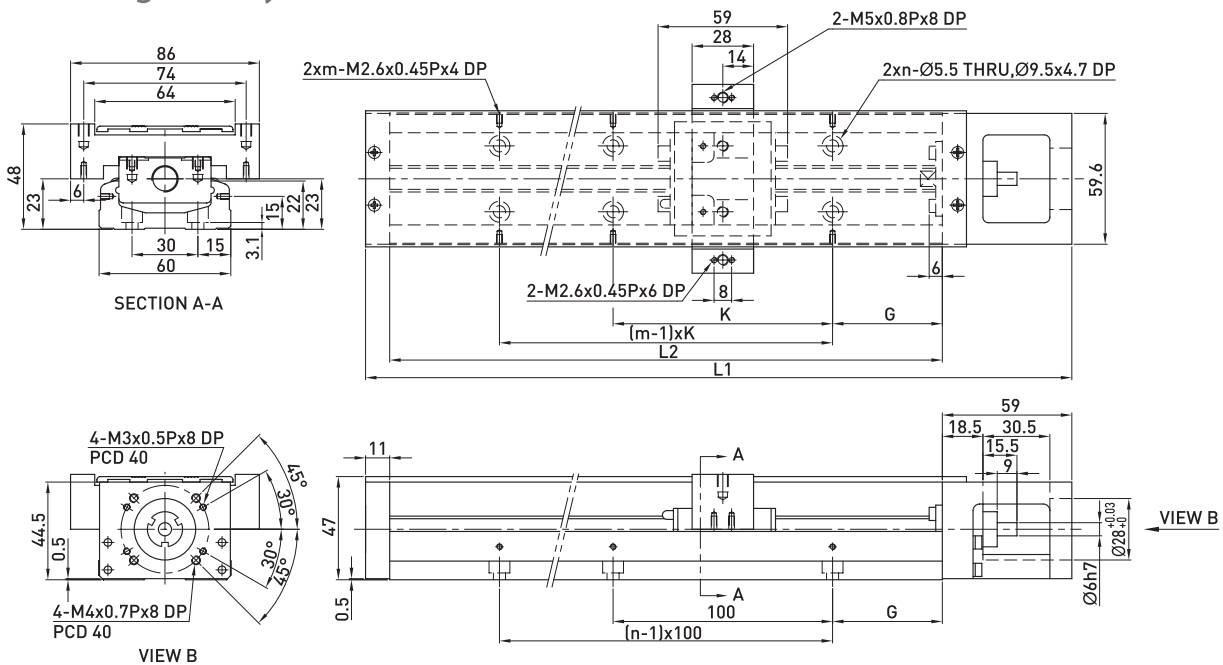
## Single Axis Robot

### KK60 (Standard)



Rail Length L2 (mm)	Total Length L1 (mm)	Maximum Stroke (mm)		G (mm)	K (mm)	n	m	Mass (kg)	
		A1 Block	A2 Block					A1 Block	A2 Block
150	220	60	-	25	100	2	2	1.7	-
200	270	110	-	50	100	2	2	2.1	-
300	370	210	135	50	200	3	2	2.7	3.0
400	470	310	235	50	100	4	4	3.3	3.6
500	570	410	335	50	200	5	3	3.9	4.2
600	670	510	435	50	100	6	6	4.6	5.0

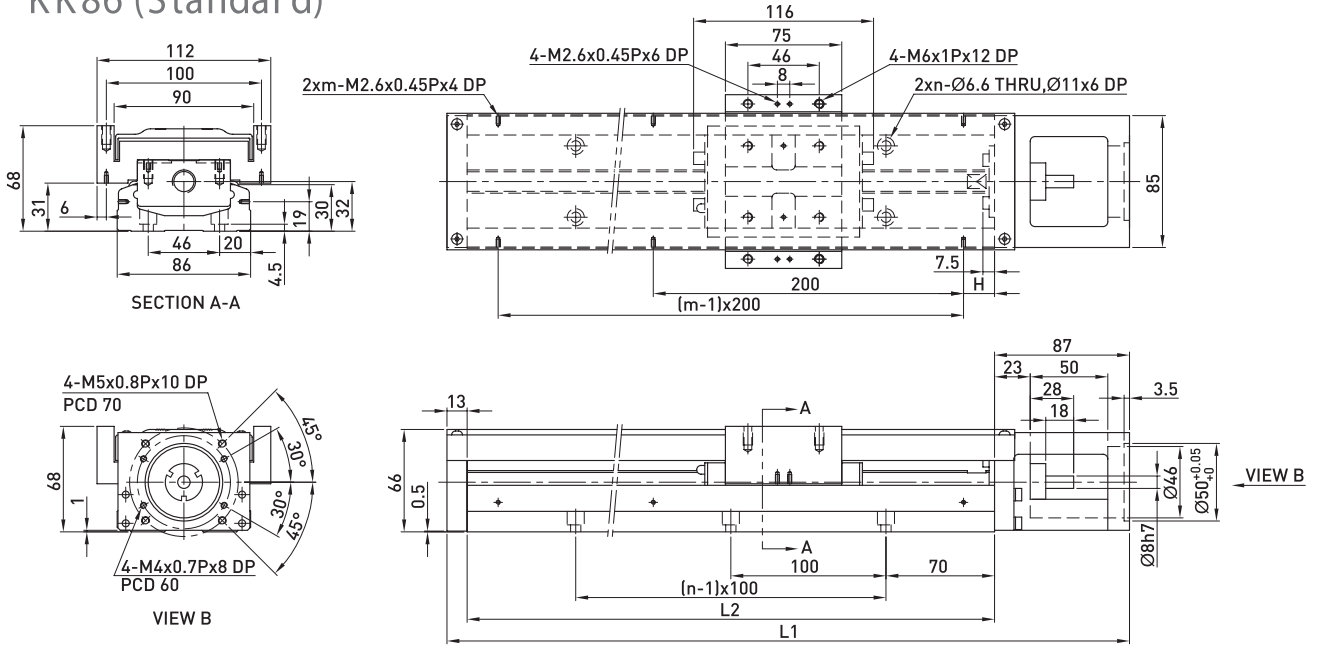
### KK60 (Light Duty)



Rail Length L2 (mm)	Total Length L1 (mm)	Maximum Stroke (mm)		G (mm)	K (mm)	n	m	Mass (kg)	
		S1 Block	S2 Block					S1 Block	S2 Block
150	220	85	34	25	100	2	2	1.6	1.8
200	270	135	84	50	100	2	2	1.9	2.1
300	370	235	184	50	200	3	2	2.5	2.7
400	470	335	284	50	100	4	4	3.1	3.3
500	570	435	384	50	200	5	3	3.7	3.9
600	670	535	484	50	100	6	6	4.4	4.6

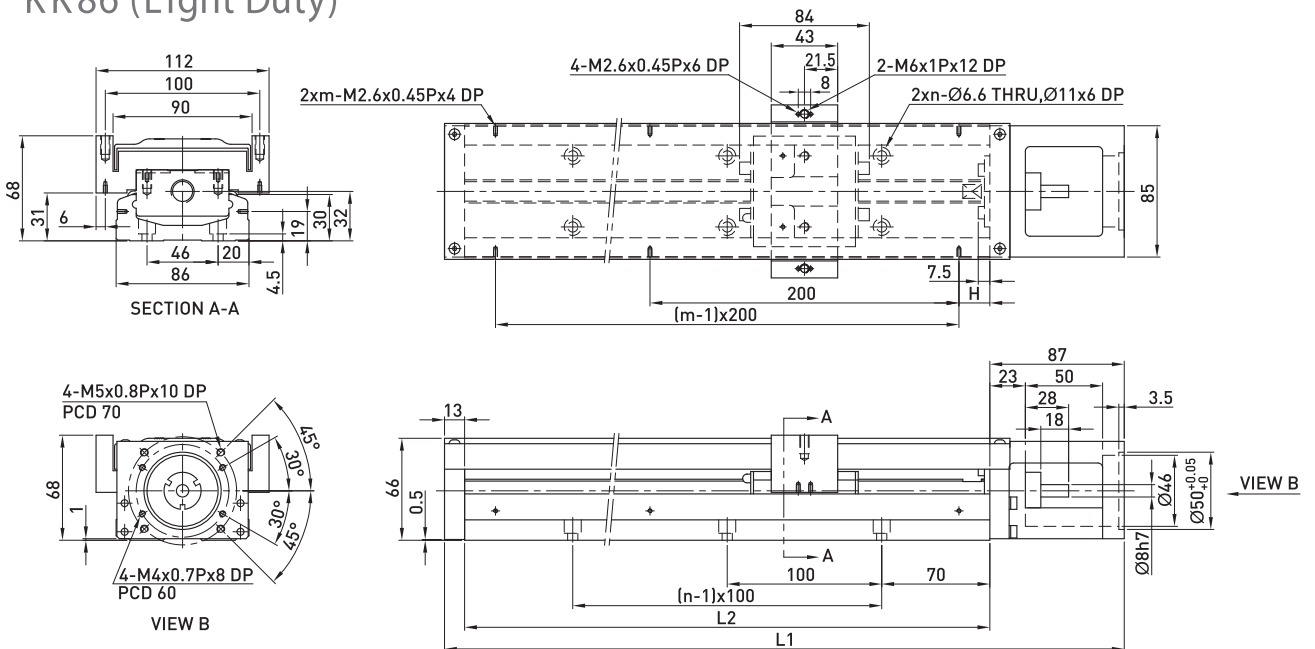
# Single Axis Robot

## KK86 (Standard)



Rail Length L2 (mm)	Total Length L1 (mm)	Maximum Stroke (mm)		H (mm)	n	m	Mass (kg)	
		A1 Block	A2 Block				A1 Block	A2 Block
340	440	210	100	70	3	2	6.5	7.3
440	540	310	200	20	4	3	7.8	8.6
540	640	410	300	70	5	3	9.0	9.8
640	740	510	400	20	6	4	10.3	11.3
740	840	610	500	70	7	4	11.6	12.4
940	1040	810	700	70	9	5	13.0	13.8

## KK86 (Light Duty)



Rail Length L2 (mm)	Total Length L1 (mm)	Maximum Stroke (mm)		H (mm)	n	m	Mass (kg)	
		S1 Block	S2 Block				S1 Block	S2 Block
340	440	246	170	70	3	2	6.3	7.1
440	540	346	270	20	4	3	7.6	8.4
540	640	446	370	70	5	3	8.8	9.6
640	740	546	470	20	6	4	10.1	11.1
740	840	646	570	70	7	4	11.4	12.2
940	1040	846	770	70	9	5	12.8	13.6

