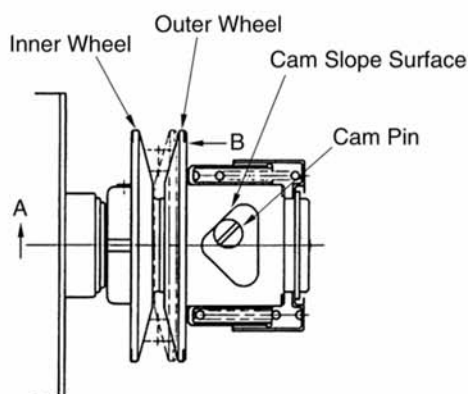




- Standard V-belt is used
- Cam mechanism prevents slips
- Easy mounting using an adapter



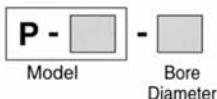
Specification

Model	Motor (4P)	Deceleration Ratio	Belt	Transmission Capacity [kW]			Mass [kg]
				High Speed	Medium Speed	Low Speed	
P-86	0.2~0.4kW	1 : 1.5	A	0.7	0.4	0.3	1.1
P-98	0.4~0.75kW	1 : 1.4	A	1.2	0.7	0.4	1.8
P-106	0.4~0.75kW	1 : 1.6	B	1.3	0.9	0.6	2.0
P-124	0.75~1.5kW	1 : 1.5	B	1.8	1.2	0.8	3.0
P-164	1.5~2.2kW	1 : 1.5	C	3.2	2.2	1.2	6.0
P-218	2.2~3.7kW	1 : 1.4	C	6.2	4.4	3.2	14.0

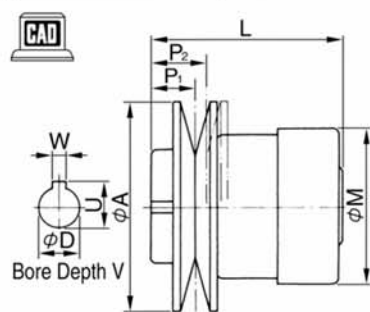
Adapter Type

Model	ϕD	Bore Depth
P-86	10 11 12 13 14 15 16	30
P-98	11 12 13 14 15 16 18 19	40
P-106		40
P-124	14 15 16 18 19 20 22 24 25	50
P-164		50
P-218	22 24 25 28	60

Ordering Information: Specify



Specification



Model	A	P1	P2	L	M	D		W		U		V	max. P.D.	min. P.D.	Moving Distance	CAD File No
P-86	86	18	21.5	78	63	11	14	5		—	16	30	77	51	20	P1
P-98	98	19	22.5	85	73	14	19	5	6	16	21.5	40	89	62	21	P2
P-106	106	21	26	96	73	14	19	5	6	16	21.5	40	95	58	29	P3
P-124	124	22	27	101	84	19	24	6	8	21.5	27	50	113	75	30	P4
P-164	164	25	32	130	102	24	28	8		27	31	50	150	96	42	P5
P-218	218	27	34	163	132	28		8		31	60	204	150	42		P6

Moving distance is the distance to move the motor needed for speed change. Specify "key type" if repetitive load, such as brake motor, is applied.

※P-164 bores for a 2.2kW motor are straight bores.

Refer to the section describing motor slide base for more information about the slide base.

Driven side rotation speed

(Rotation speed by driven pulley diameter when mounted on a 4-pole motor)

50Hz, 1430r/min

60Hz, 1720r/min

(r/min)

Model	4 Inches	6 Inches	8 Inches	10 Inches	12 Inches	14 Inches	16 Inches	18 Inches
P-86	50Hz	785~1180	510~765	375~560				
	60Hz	945~1420	610~920	450~675				
P-98	50Hz	970~1365	630~880	460~650				
	60Hz	1165~1645	755~1060	555~780				
P-106	50Hz		585~950	425~690				
	60Hz		705~1150	510~830				
P-124	50Hz		760~1140	560~840	440~665			
	60Hz		910~1370	670~1010	530~800			
P-164	50Hz		720~1120	570~885	475~735			
	60Hz		865~1350	685~1065	570~885			
P-218	50Hz			890~1205	740~1000	625~850	545~740	485~660
	60Hz			1070~1445	890~1205	750~1020	655~890	585~790



- Standard V-belt is used
- Easy mounting using an adapter
- Speed can be changed without changing center distance.
- AP is used in combination with P.

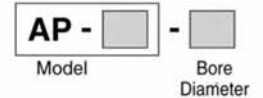
■ Adapter Type

Model	φ D	Bore Depth
AP-86	10 11 12 13 14 15 16	30
AP-98	11 12 13 14 15 16 18 19	40
AP-124	14 15 16 18 19 20 22 24 25	50
AP-164		50

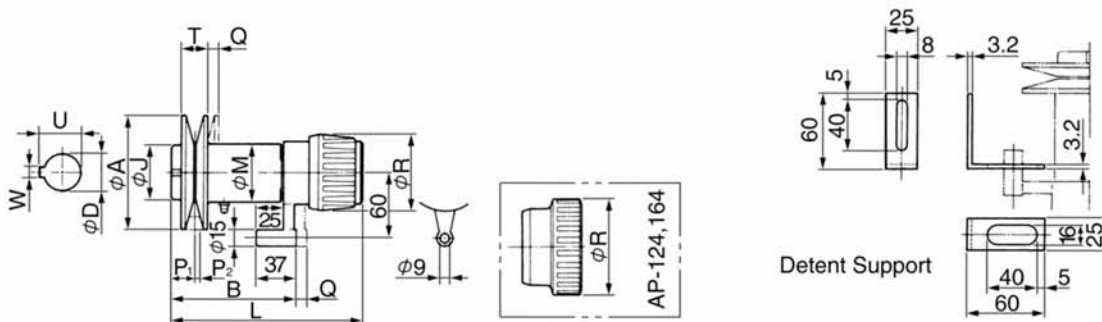
Specification

Model	Motor	Driven-Side Speed Change Drive	Belt	Speed Change Ratio	50Hz		50Hz	
					Output Rotation Speed (r/min)	Output Torque (N·m) (kgf·m)	Output Rotation Speed (r/min)	Output Torque (N·m) (kgf·m)
AP-86	0.2kW4P	P-86	A	1 : 2.2	950~2150	1.6~0.7 [0.16~0.07]	1400~2590	1.4~0.6 [0.14~0.06]
	0.2kW4P	P-98	A	1 : 2	820~1720	1.9~0.9 [0.19~0.09]	990~2060	1.6~0.8 [0.16~0.08]
AP-98	0.4kW4P	P-98	A	1 : 2	1000~2050	3.1~1.5 [0.31~0.15]	1200~2460	2.6~1.3 [0.26~0.13]
	0.4kW4P	P-124	A	1 : 1.9	890~1710	3.5~1.8 [0.35~0.18]	1070~2060	2.9~1.5 [0.29~0.15]
AP-124	0.75kW4P	P-124	B	1 : 2.2	950~2150	6.1~2.7 [0.61~0.27]	1140~2590	5.1~2.3 [0.51~0.23]
	0.75kW4P	P-164	B	1 : 2	810~1660	7.2~3.5 [0.72~0.35]	970~2000	6.0~2.9 [0.6~0.29]
AP-164	1.5kW4P	P-164	C	1 : 2.4	920~2230	12.7~5.2 [1.27~0.52]	1110~2680	10.5~4.4 [1.05~0.44]
	1.5kW4P	P-218	C	1 : 2	680~1360	17.2~8.6 [1.72~0.86]	810~1640	14.4~7.1 [1.44~0.71]

■ Ordering Information : Specify



Design Types and Dimensions



(4-pole motor 50Hz 1430r/min, 60Hz 1720r/min)

Model	A	B	J	L	M	P1	P2	Q	R	T	D	W	U	max. P.D.	min. P.D.	Moving Distance	Mass [kg]
AP-86	86	93	46	156	54	18	3.5	7	70	18	11	—	—	77	51	30	1.7
AP-98	98	103	50	166	54	19	3.5	7	70	20	14	5	16	89	62	40	1.9
AP-124	124	126	68	196	62	22	5	10	88	24	19	6	21.5	113	75	50	3.2
AP-164	164	137	68	211	66	25	7	14.5	88	30	24	8	27	150	96	50	4.8

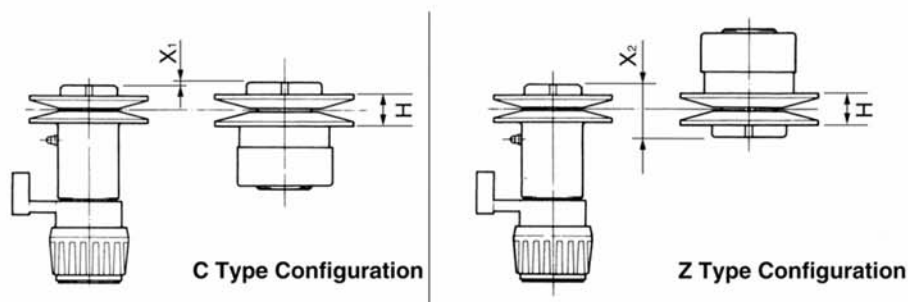
※Set the input rotation speed at 1800r/min. or less. (4-pole motor drive is recommended.)

■ Belt No. and center distance

Model	Driven-Side Speed Change Drive	Belt No.					
		Center Distance	Center Distance	Center Distance	Center Distance	Center Distance	Center Distance
AP-86	P-86	A-20	A-21	A-22	A-23	A-24	A-25
		153	165	179	191	204	216
AP-86	P-98	A-20	A-21	A-22	A-23	A-24	A-25
		143	155	169	181	194	206
AP-98	P-98	A-21	A-22	A-23	A-24	A-25	A-26
		147	160	172	186	198	211
AP-98	P-124	A-23	A-24	A-25	A-26	A-27	A-28
		163	177	189	202	215	227
AP-124	P-124	B-25	B-26	B-27	B-28	B-29	B-30
		168	181	194	206	220	232
AP-124	P-164	B-28	B-29	B-30	B-31	B-32	B-33
		190	203	216	228	241	254
AP-164	P-164	C-32	C-33	C-34	C-35	C-36	C-37
		211	224	237	249	262	275
AP-164	P-218	C-38	C-39	C-40	C-41	C-42	C-43
		241	254	267	279	293	305

※See next page about running line.

Configuration



The belt running line X is shown in the table below.

Combination	AP86 P86	AP86 P98	AP98 P98	AP98 P124	AP124 P124	AP124 P164	AP164 P164	AP164 P218
H	25	24.5	25	31	34	39.5	44	42.5
C Type Configuration X ₁	0	1	0	3	0	3	0	1.5
Z Type Configuration X ₂	39.5	40.5	41.5	44.5	49	52	57	58.5

Design Check Items

1. Install the type AP on the driving side (motor) and type P on the driven side.
2. Set the input rotation speed within the range of 900r/min to 1800r/min.
3. The speed changer is of the lubrication type and requires periodic lubrication.
4. When installing the type AP, be sure to fix the detent rod of type AP using the detent support supplied as an accessory. If the detent support supplied as an accessory cannot be used, fix the detent so that it can be slid without difficulty.
5. Install in a well-ventilated place, avoiding a place which is moist

and dust, high in ambient temperature, where water or oil is splashed, or with a corrosive or flammable gas ambience. Install in a place which allows easy checking.

The operating ambient temperature is -10°C to $+40^{\circ}\text{C}$.

6. Mount on the shaft correctly. Install a cover on the rotating part when mounting it on a machine.
7. Do not rotate the handle when the speed changer is stopped.
8. Consult Miki Pulley or its agent in your country when installing speed change drives in a machine which operates in forward and reverse directions and is exposed to repetitive loads and impact loads.

Option

Handle with rotation speed indicator

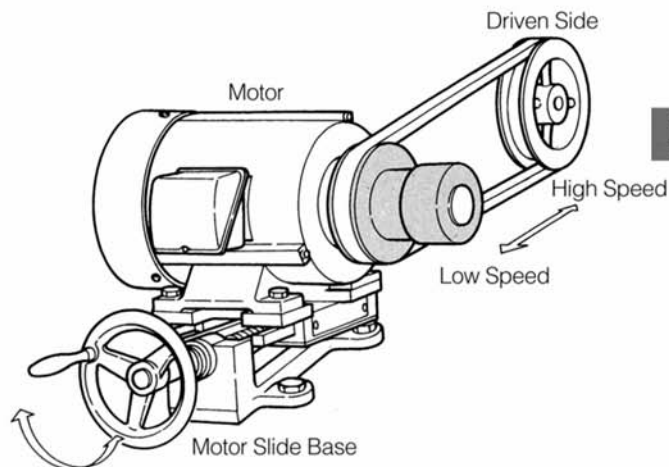


A handle rotation speed indicator (SD Type) can be contained in the standard handle.

Model	Handle Rotation Speed	SD Type
AP-86-SD	3.5	SD-53B-5L
AP-98-SD	3.5	
AP-124-SD	5	SD-75B-9L
AP-164-SD	7	



- Standard V-belt is used
- Large Speed Change Ratio



3

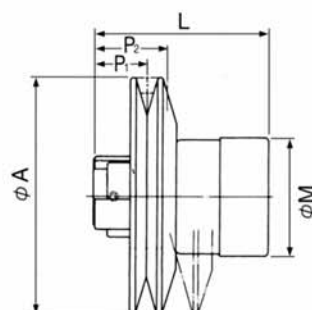
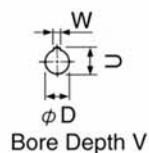
Specification

Model	Motor [kW] (4P)	Speed Change Ratio	Belt	Transmission Capacity [kW]			Mass [kg]
				On high rotation	On medium rotation	On low rotation	
PL-116	0.2	1 : 2.3	M	0.5	0.3	0.2	2.0
PL-140	0.4	1 : 2	A	2.1	1.4	0.6	2.7
PL-170	0.75	1 : 2.1	B	3.6	2.4	1.0	5.5
PL-210	1.5	1 : 2.4	B	5.2	3.1	1.5	7.8

■ Ordering Information: Specify

PL - ☐
Model

Design Types and Dimensions



Model	A	P1	P2	L	M	D	W	U	V	max. P.D.	min. P.D.	Moving Distance	CAD File No.
PL-116	116	24	33.5	90	56	11	—	—	40	111	48	49	PL2
PL-140	140	28	38	97	84	14	5	16	40	131	65	52	PL3
PL-170	170	38.5	52	126	84	19	6	21.5	50	159	74	67	PL4
PL-210	212	41	59	148	95	24	8	27	60	201	83	93	PL5

※Moving distance is the distance to move the motor for speed change.



- Wide-width Speed Change Belt is used
- Large Speed Change Ratio
- Large Transmission Capacity

Specification

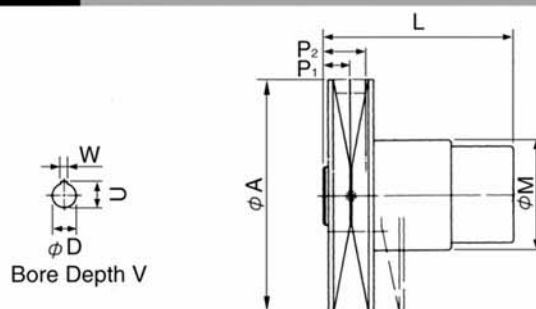
Model	Motor [kW]	Speed Change Ratio	Belt	Transmission Capacity [kW]			Mass [kg]
				On high rotation	On medium rotation	On low rotation	
PK-150	0.4 (4P)	1 : 3	1422V	1.5	1.0	0.4	3.2
PK-200	0.75 (4P)	1 : 3	1922V	3.7	2.3	0.5	6.2
	1.5 (4P)						
PK-250	2.2 (4P)	1 : 3	2926V	8.0	5.2	1.1	13
	3.7 (4P)						
PK-300	5.5 (4P)	1 : 3	4430V	13	12	2.5	24
	11 (4P)						
PK-355	11 (6P)	1 : 2.5	4430V	16	11	5.5	58
	15 (6P)						
PK-400	18.5 (6P)	1 : 2	4430V	18	15	9.8	66

※When using a slide base for PK-355 and 400, consult Miki Pulley or its agent in your country.

Ordering Information: Specify

PK- ☐
Model

Design Types and Dimensions



Model	A	P ₁	P ₂	L	M	D	W	U	V	max. P.D.	min. P.D.	Moving Distance	CAD File No.
PK-150	150	19	28.5	120	81	14	5	16	30	144	48	75	PK1
PK-200	200	23	35.5	160	95	19	6	21.5	40	192	64	101	PK2
						24	8	27	50				
PK-250	250	31	49.5	210	126	28	8	31	60	240	80	126	PK3
PK-300	305	50	76	300	143	38	10	41	80	290	96	152	PK4
						42	12	45	110				
PK-355	355	54	81.5	355	214	42	12	45	110	343	137	162	PK5
						48	14	51.5					
PK-400	400	51	77	355	214	55	16	59	110	388	194	152	PK6
						55	16	59					

※Moving distance is the distance to move the motor for speed change.

■ Driven-Side Rotation Speed (At input of 50Hz 1430r/min or 60Hz 1720r/min of 4-pole motor)

[r/min]

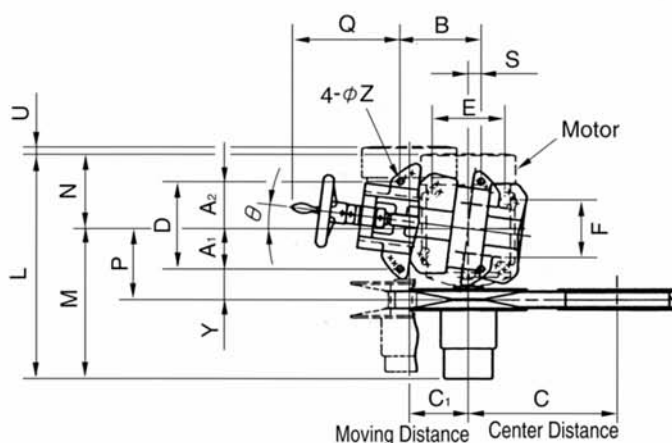
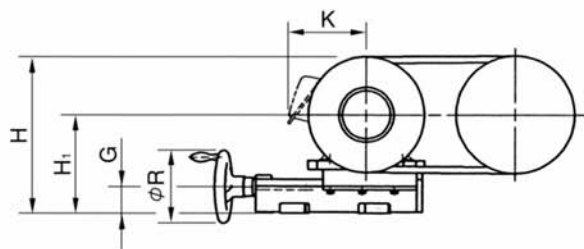
Driven-Side Pulley Diameter		6 inches	8 inches	10 inches	12 inches	14 inches	16 inches	20 inches	24 inches
Model									
PK-150	50Hz	470~1410	350~1050	280~840	230~690				
	60Hz	565~1700	420~1260	335~1010	275~830				
PK-200	50Hz	640~1920	470~1410	380~1140	310~930				
	60Hz	765~2300	565~1700	460~1380	375~1130				
PK-250	50Hz			470~1410	390~1170	330~990	290~870		
	60Hz			565~1700	470~1410	395~1190	345~1040		
PK-300	50Hz			580~1740	470~1410	400~1200	350~1050		
	60Hz			695~2090	565~1700	480~1440	420~1260		
PK-355*	50Hz				440~1100	380~950	330~825	260~655	
	60Hz				530~1325	450~1130	395~985	310~780	
PK-400*	50Hz					530~1060	470~940	370~740	310~620
	60Hz					635~1270	565~1130	445~890	370~740

※Rotation speeds marked * are at input of 50Hz 950r/min or 60Hz 1130r/min of 6-pole motor.

※See two pages following about the driven-side pulley. Be sure to use driven-side pulleys equal or larger diameter.

■ How to maintain belt running line constant

One end of the PK pulley is open. The belt running line will move between P1 and P2 when the center distance is increased or reduced each time for speed change. However, this type uses a wide-width speed change belt and the running line must be maintained relatively strictly. To accomplish this, the pulley itself is moved back when the center distance is increased, moved forward when the distance is reduced. This is why the motor slide base (RK) is needed. The base allows increase or reduction of the center distance and moving back and forward of the pulley simultaneously. The slide base maintains the belt running line always constant.



Model	Speed Change Drive	Motor	A1	A2	B	C1	D	E	F	G	H	H1	K	L	M	N	P	Q	R	S	U	Y	Z	θ
RK-05	PK-150	0.4kW (4P)	75	85	140	75	160	112	90	20	195	121	127	330	210	116	109	150	125	33	9	34	11	7°
RK-20	PK-200	0.75kW (4P)	69	81	140	101	150	125	100	45	270	170	135	390	260	130	123	195	125	22	12	54	11	7°
		1.5kW (4P)						140	125		280	180	151	430	279	151	142					73		
RK-50	PK-250	2.2kW (4P)	90	110	200	126	200	160	140	50	310	200	162	510	343	167	164	186	140	40	19	74	11	9°
		3.7kW (4P)						190	140		335	212	172	524	350	174	171					81		
RK-100	PK-300	5.5kW (4P)	146	174	250	152	320	216	140	60	390	252	206	663	459	204	209	249	200	52	26	63	15	10°
		7.5kW (4P)						216	178		390	252	206	701	478	223	228					82		
		11kW (4P)						254	210		440	280	263	785	513	272	263					116		



- Wide-width Speed Change Belt is used
- Double swinging type
- Easy mounting
- The belt running line is maintained always constant and a long belt life is assured.
- Design of both the speed changer and belt provides room. Excellent durability is assured.

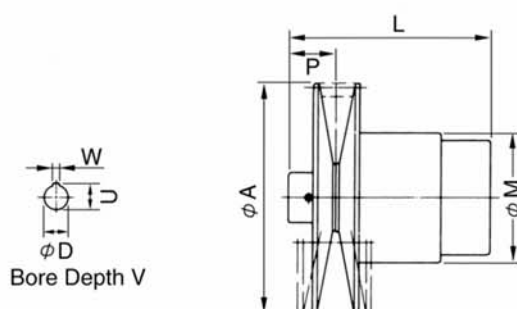
Specification

Model	Motor [kW] (4P)	Speed Change Ratio	Belt	Transmission Capacity [kW]			Mass [kg]
				On high rotation	On medium rotation	On low rotation	
PF-155	0.4	1 : 2.4	1422V	1.6	1.1	0.4	4
	0.75						
PF-185	0.75	1 : 2.4	1922V	3.6	2.2	0.5	6
	1.5						
PF-216	1.5	1 : 2.4	2322V	5.2	3.8	1.1	10
	2.2						
PF-250	2.2	1 : 2.4	2926V	8.0	6.2	2.0	19
	3.7						

■ Ordering Information: Specify



Design Types and Dimensions



Model	A	P	L	M	D	U	W	V	max. P.D.	min. P.D.	Moving Distance	CAD File No.
PF-155	155	29	140	94	14	16	5	30	150	62	69	PF1
					19	21.5	6	40				
PF-185	185	38	163	104	19	21.5	6	40	178	74	82	PF2
					24	27	8	50				
PF-216	216	51	203	127	24	27	8	50	208	86	96	PF3
					28	31		60				
PF-250	250	54	252	154	28	31	8	60	241	100	111	PF4

※Moving distance is the distance to move the motor for speed change.

■ Driven-Side Rotation Speed (At input of 50Hz1430r/min or 60Hz 1720r/min of 4-pole motor) Belt No. and Center Distance

Model	Driven-Side Pulley Diameter	Driven-Side Rotation Speed (r/min)	Belt and Center Distance [mm] (when C= PF Type max.P.D.)					
PF-155	6 inches	600 ~ 1440	Belt No.	1422V360	1422V400	1422V420	1422V466	1422V480
		720 ~ 1728	Center Distance (mm)	224	276	301	355	376
	8 inches	445 ~ 1060	Belt No.	1422V400	1422V420	1422V466	1422V480	1422V540
		535 ~ 1290	Center Distance (mm)	234	260	312	334	413
PF-185	8 inches	520 ~ 1285	Belt No.	1922V403	1922V417	1922V426	1922V443	1922V454
		625 ~ 1545	Center Distance (mm)	220	234	245	267	280
	10 inches	415 ~ 1020	Belt No.	1922V454	1922V484	1922V526	1922V544	1922V604
		500 ~ 1230	Center Distance (mm)	238	277	329	352	430
PF-216	10 inches	495 ~ 1200	Belt No.	2322V481	2322V521	2322V541	2322V601	2322V621
		600 ~ 1440	Center Distance (mm)	254	299	329	406	429
	12 inches	415 ~ 1000	Belt No.	2322V541	2322V601	2322V621	2322V661	2322V681
		500 ~ 1205	Center Distance (mm)	287	364	387	444	462
PF-250	12 inches	485 ~ 1165	Belt No.	2926V574	2926V586	2926V606	2926V616	2926V636
		580 ~ 1400	Center Distance (mm)	303	318	344	366	381
	14 inches	410 ~ 990	Belt No.	2926V616	2926V636	2926V646	2926V666	2926V686
		495 ~ 1185	Center Distance (mm)	321	336	350	375	401

※Be sure to use driven-side pulleys equal or larger diameter.

■ Driven-side pulley

(V-pulley for wide-width speed change belt)

The sectional profile of the wide-width speed change belt is different from that of the standard V-belt. Therefore, the V-pulley sold on the market cannot be used. As an alternative, a multi-belt V-pulley complying with the JIS standard sold on the market can be purchased and machined to match the shapes of the V-grooves to the individual wide-width speed change belts.

V-pulley	Belt Size
Type C One Belt	1422V
Type A Two Belts	1922V
Type B Two Belts	2322V
Type C Two Belts	2926V
Type D Four Belts	4430V

Belt Size	1422V	1922V	2322V	2926V	4430V	
V-pulley	Type C One Belt	Type A Two Belts	Type B Two Belts	Type C Two Belts	Type D Four Belts	Surface Roughness
Processing Diagram						3~12S
						Detail of A part

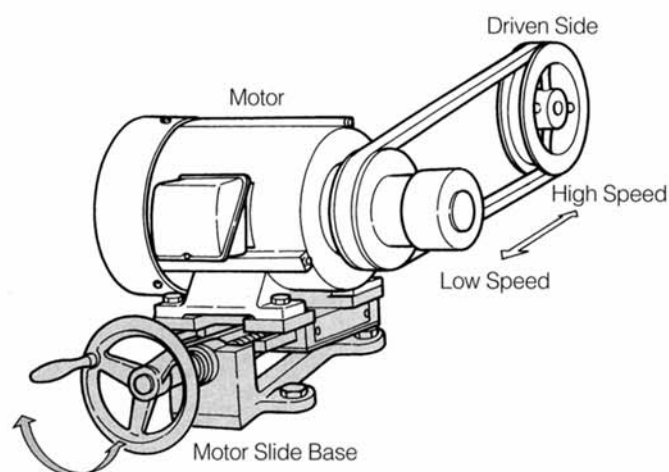
※Use the driven-side pulley by additionally processing a V-pulley sold on the market. Use the driven-side pulley of the PK type by additionally processing a V-pulley sold on the market.

R-□ • RK-□ • RH-50 MOTOR SLIDE BASE

3



Speed Change Method



Specification

Model	Motor (4P) [kW]	Movable Distance	Pulley Model				Mass [kg]
			P	PL	PK	PF	
R-05	0.2, 0.4 0.75	70	P-86, P-124 P-98 P-106	PL-170 PL-116 PL-140		PF-155 PF-185	8.5
R-20	1.5	110	P-164	PL-210		PF-185	10.5
R-30	2.2	140	P-218			PF-216	16
RK-05	0.2 0.4	90	P-86, P-98 P-106	PL-116 PL-140	PK-150	PF-155	5.5
RK-20	0.75 1.5	140	P-124, P-164	PL-170 PL-210	PK-200	PF-185 PF-216	11.0
RK-50	2.2 3.7	160	P-218		PK-250	PF-216 PF-250	18.5
RK-100	5.5, 7.5	200			PK-300		40.0
RK-200	11 18.5	200			PK-355		43.0
RH-50	3.7, 5.5	170				PF-250	25.0

※The model numbers of motors 18.5kW and larger differ between the totally-enclosed fan-cooled type and drip-proof

■ Ordering Information: Specify

R -
Model

■ Ordering Information: Specify

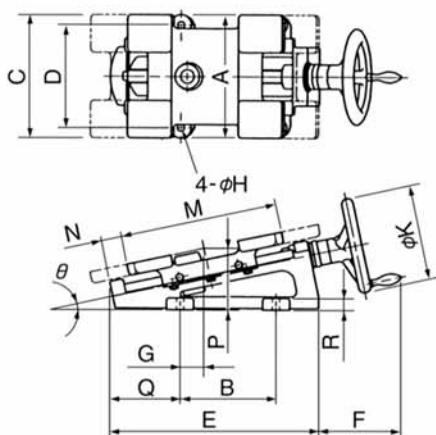
RK -
Model

■ Ordering Information: Specify

RH - 50
Model

Design Types and Dimensions

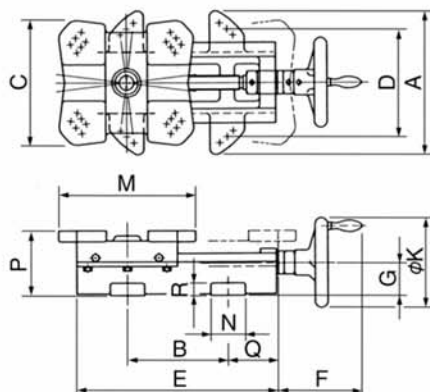
■ R-□



3

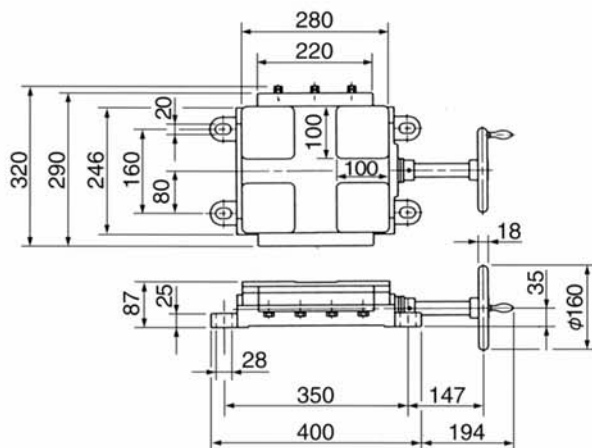
Model	A	B	C	D	E	F	G	H	K	M	N	P	Q	R	θ	CAD File No.
R-05	145	120	130	115	245	100	15	10.5	125	180	27	86	92	16	12°	R1
R-20	180	140	180	150	305	120	35	10.5	140	230	30	90	102	17	12°	R2
R-30	200	160	190	160	365	200	42	13	160	270	42	114	123	17	12°	R3

■ RK-□



Model	A	B	C	D	E	F	G	K	M	N	P	Q	R	CAD File No.
R-05	200	140	131	160	222	110	20	125	153	40	50	42	10	R4
R-20	200	140	175	150	280	122	45	125	190	48	90	70	17	R5
R-50	260	200	210	200	320	128	50	140	250	60	100	60	17	R6
RK-100	390	250	252	320	450	150	60	200	283	90	120	100	20	R7
RK-200	390	250	350	320	450	150	60	200	350	90	120	100	20	R8

■ RH-50



● CAD File No. : R9

How to mount motor on the slide base.

※Decide the motor mounting position and drill tapping bores on the slide base.

※Fix the motor lugs using bolts. Mount a speed changer on the motor shaft.

Design Check Items

Design Capacity

The design capacity is determined using the following formula. Calculate the capacity of the driven shaft at the maximum and minimum speeds for operation at a constant torque.

$$Prd = Pr \times F \quad Pr: \text{Design capacity (kW)} \quad F: \text{Correction coefficient for load characteristics}$$

$$Pr: \text{Transmission capacity (kW)}$$

Correction coefficient for load characteristics : F

Load characteristics	Daily operation time		
	8 hours	16 hours	24 hours
Light loads (Constant loads lower than the rated capacity without frequent interruptions)	1.0	1.1	1.2
Medium loads (Below 125% of the maximum load)	1.2	1.3	1.4
Heavy loads (Below 150% of the maximum load)	1.3	1.4	1.5

Formula expressing the relationship of torque and capacity

$$T \text{ (N} \cdot \text{m)} = 9550 \times \frac{P}{N} \quad T: \text{Transmission torque (N} \cdot \text{m)} \text{ (kgf} \cdot \text{m)} \quad P: \text{Transmission capacity (kW)} \quad N: \text{Speed (r/min)}$$

$$T \text{ (kgf} \cdot \text{m)} = 973.5 \times \frac{P}{N}$$

Speed of the Input Shaft

As a standard design, the variable speed pulley should be fixed to a four-pole motor. When you design a system, make sure that the circumferential speed of the pulley is 25m/sec or less.

The variable speed pulley is designed for use within the range of the belt speed. If it is used at speeds below the minimum belt speed, belt life may be shortened. In addition as speed decreases, speed shifts exert greater force on the belt. Ideally, the minimum belt speed should be set to 500 rpm.

$$\text{Calculation of the belt circumferential speed} \quad V = \frac{\pi \times D \times N}{60 \times 1000} \quad V: \text{Circumferential speed of belt (m/sec)} \quad D: \text{Pitch diameter of pulley (mm)} \quad N: \text{Speed (r/min)}$$

Calculation of the Speed of the Driven Shaft

You can select a driven pulley that will provide the speed range most suited to your purpose in combination with the variable speed pulley. We recommend that you select a driven pulley whose pitch diameter falls in the range between the maximum pitch diameter (max. P.D.) to twice the maximum pitch diameter of the variable speed pulley. Calculate the speed of the driven axis using the following formula.

$$N_{\max} = \frac{d_{\max} \times n}{D} \quad \text{Maximum speed (r/min)}$$

$$N_{\min} = \frac{d_{\min} \times n}{D} \quad \text{or } N_{\max} / \alpha \quad \text{Minimum speed (r/min)}$$

n : Speed of the variable speed pulley (r/min)

α : Speed change ratio of the variable speed pulley

d_{\max} : Maximum pitch diameter of the variable speed pulley (mm)

D : Pitch diameter of the driven pulley (mm)

d_{\min} : Minimum pitch diameter of the variable speed pulley (mm)

Selection of Belt Size

Selecting a belt shape

When you select a belt shape, consider the design allowance and the maximum and minimum speeds of the driven shaft.

When two shapes intersect, design the system in two versions by using both shapes, then using the one that is more ideal for the design purpose.

Calculation of an approximate center distance between the two shafts (for reference)

Before installing the variable speed pulley, you must determine the center distance between the two shafts, which depends on the driven pulley diameter and the length of the available belt and installation space for the speed change gear.

The following formula gives a standard center distance between the two shafts.

$$\text{Minimum center distance between the two shafts } C_{\min} = \frac{(D_1 + D_2)}{2} + 50 \text{ (mm)}$$

$$\text{Maximum center distance between the two shafts } C_{\max} = 1.5 (D_1 + D_2) \text{ (mm)}$$

D_1 : Outer diameter of the variable speed pulley (mm)

D_2 : Outer diameter of the driven pulley (mm)

Determination of Belt Length

After calculating (the speed of) the driven pulley and an approximate center distance c between the two shafts, calculate belt length (L) using the following formula.

$$L = 2C + \frac{\pi}{2} (D + d_{\min}) + \frac{(D - d_{\min})^2}{4C}$$

L : Outer diameter of the variable speed pulley (mm)

d_{\min} : Outer diameter of the driven pulley (mm)

D : Outer diameter of the variable speed pulley (mm)

Select a belt of the calculated length.

Determination of the center distance between the two shafts

Determine an actual center distance between the two shafts based on (the length of) the selected belt using the following formula.

$$C = \frac{b + \sqrt{b^2 - 8(D - d_{\min})^2}}{8} \quad \text{where } b = 2L - \pi(D + d_{\min})$$

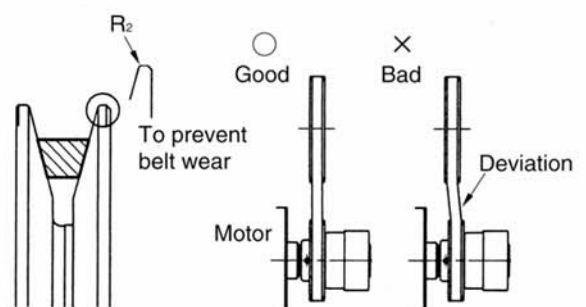
d_{\min} : Minimum pitch diameter of the variable speed pulley (mm)

D : Pitch diameter of the driven pulley (mm)

The above calculation gives the maximum center distance between the two shafts. When you shift speeds, the center distance decreases. Take this change into account when determining the installation space.

Others

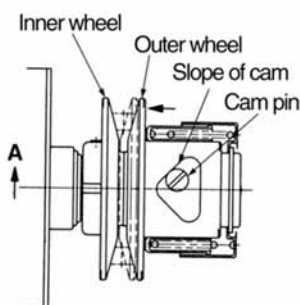
1. Install in a well-ventilated place, avoiding a place which is moist and dust, high in ambient temperature, where water or oil is splashed, or with a corrosive or flammable gas ambience. Install in a place which allows easy checking.
The operating ambient temperature is -10°C to $+40^\circ\text{C}$.
2. Make sure to produce belt running line, parallelism of two shafts and perpendicularity correctly when installing a speed changer.
3. Install a cover on the rotating part when mounting on a machine.
4. The base to mount the equipment on must be secure. Inadequate mounting causes vibration during operation. Mount securely using bolts that have a sufficient strength.
5. When you mount the motor on a transfer stand, install a stopper for the plate to prevent the belt from slipping off or being pulled too tight.
6. Consult Miki Pulley or its agent in your country when installing speed change drives in a machine which operates in forward and reverse directions and is exposed to repetitive loads and impact loads.
7. To increase the life of the belt, chamfer the edge of the pulley wheel to $2R$, as shown in the illustration below.



Cam mechanism

The outer wheel (movable wheel) is pressed by a spring. When the load fluctuates and changes belt tension, the spring is pushed back to move the belt inward, changing the belt speed. To guard against this, a cam mechanism is incorporated into the type T speed change gear.

When the motor shaft rotates in the direction of arrow A in the illustration below, a cam pin installed in the main unit (the speed change gear) rotates the outer wheel with the slope of the cam. As a result, a force proportional to the belt load is applied in the direction of arrow B to push the V belt to the dotted line and increases its speed. When the V belt is not under load, it is kept loose to release pressure from bearings or other parts. When the V belt is loaded, it is appropriately tensioned to increase its speed without slipping. This compensates for decreasing motor speed and maintains a constant speed for the driven shaft.



Key system without cam mechanism

A key system is capable of withstanding shock loads and repeated operation in normal and opposite directions. It should accept brake motor installation. The inner and outer wheels of this type are combined with a sliding key instead of a cam pin. The speed change gear is also equipped with a strong spring that corresponds to the transmission capacity of the belt.

The belt and the spring protect the speed change gear by absorbing shock loads.

■ Installation to Motor Shaft

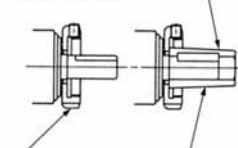
Adapter type

Some speed change gears have a taper sleeve (adapter) to prevent shocks to the main unit when installed on motor shafts of type P and AP or other shafts.

Insert the adapter into a taper hole of the inner wheel and apply pressure by tightening a nut (P-nut). The adapter is secured by the wedge effect.

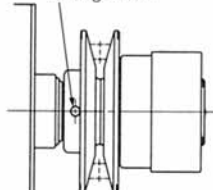
To install a speed change gear on a motor shaft, follow the steps below.

③ Cut the part of the key that projects from the adapter. If the key is too wide to permit easy insertion of the adapter, reduce the width.



① Insert a P-nut. ② Insert the adapter.

⑤ Tighten the P-nut locking screw.



④ Insert the main unit of the speed change gear and tighten the P-nut. Confirm that it is centered at the motor shaft. Repeat the process if it is not centered.

Straight hole type

Speed change gears of types PL, PK and PF have a straight fixing hole and are fixed to a motor shaft or other shafts using a standard key and locking screws. To avoid shocks to the speed change gear in installing it on a shaft, protect the pulley by engaging a V belt in its V-groove, placing a pad on the end of the pulley shaft and tapping it. Tighten the two locking screws located perpendicular to each other at the key groove. If the locking screw is not visible, rotate the pulley with the belt until you can see it.

■ Operation

1. Don't attempt to shift speeds when the speed change gear is at rest.
2. It may be rotated in either direction.
3. Never operate the speed change gear in either normal or opposite direction without stopping it first (except with types P and PL).
4. With types P, PL, PK and PF, which are designed to change the center distance between the shafts of motor and the speed change gear, shift the motor toward the machine to increase speed and away from the machine to decrease speed.
5. Use a motor sliding base (types R and RK) to change the center distance between the two shafts.
6. Set a stopper at the motor sliding base to protect the belt from excessive tension and to prevent it from slipping off the pulley at high or low speeds.
7. If the speed change gear goes unused for long periods, check the pulley for rusting and the belt for tension.
8. Lubricate the speed change gear regularly (once every one to six months). To maintain lubrication on the sliding surface of the pulley, operate the speed change gear once a week and perform several speed shifts from high to low.
9. Check the belt for abnormal wear.
10. The variable speed pulley incorporates a powerful spring. To avoid injury, do not attempt disassembly.