Circular P&P drive Compact, high speed and high accuracy

PPIM Series

● Shaft interval: 63, 80 and 110 mm

Specifications

CAD

Descriptions		PPIM063					PPIM080					PPIM110					
Swing direction Note 1. Index specifications	Index number Note 2	4	6	8	12	16	4	6	8	12	16	4	6	8	12	16	
	Min. index angle °	140	105	75	60	90	160	120	80	60	90	150	100	75	60	90	
	Indexing accuracy " (sec.)	±30															
	Repeatability " (sec.)	20															
	Dwell accuracy " (sec.)	30 (dwell angle 90 degrees or less), 60 (dwell angle exceeding 90 degrees) Note 3.															
	Cam curve	MS curve (standard), MC curve, MT curve, Trapecloid curve															
Lift direction	Lift range (mm)	4 to 10										4 to 15					
	Standard lift mm	4	6	8	10		4	6	8	10		4	6	8	10	12	15
	Min. index angle °	32	39	45	50		31	37	43	47		22	27	31	34	37	41
	Stroke accuracy mm	±0.1															
	Repeatability mm	±0.02															
	Cam curve	MS curve															
Input shaft rotational speed rpm		max.600															
Product weight kg		18					32					68					
Oil level ℓ		1.0					1.8					4.0					
Paint color		Silver															

Note 1. For oscillation specifications, contact CKD.
Note 2. For specifications whose index number exceeds 16, contact CKD.
Note 3. When you prefer the specification exceeding dwell angle of 90 degrees with dwell accuracy of 60", contact CKD.
Note 4. For details of accuracy, refer to the page B-30.

How to order

RPIM (A) 063 (B) - 016 (C) 010 (D) S (E) L (F) S (G) 1 (H) - X012345 (I)

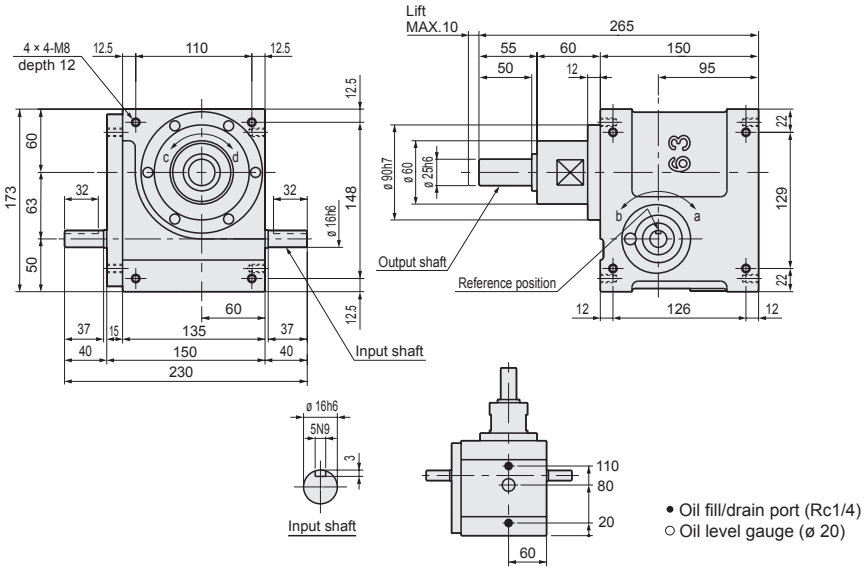
(A) Model No.	(B) Shaft interval		(C) Index number (n) and oscillating angle (ψ)		(D) Lift (Lo)		(E) Cam curve		(F) Spiral direction of the cam	
PPIM Index P&P Motion	063	63 mm	PPIM Index number (n)		004 to 015	4 mm to 15 mm	S	MS curve (standard)	PPIM (spiral direction of the cam)	
	080	80 mm							L	Left helix (standard)
	110	110 mm	004	4			C	MC curve (MCV50)		
			006	6						
			008	8			T	MT curve		
			012	12						
			016	16			P	Trapecloid curve		
							*	This indicates the cam curve for the swing direction. When there are more than 1 cam curve, this will be "x".	R	Right helix

	Ⓖ Shape of the output shaft		Ⓗ Installation position		Ⓘ Special specification No.
	S	Straight (without keyway) * For the following specifications, contact CKD. • With Torque saver	1	Position 1 Output shaft facing upward * For the position other than #1, contact CKD.	* To place an order for a P&P drive, "Special specification number" is required. The special specification model number shall be determined after the consultation with the customer. Mounting options are available upon request. Please provide CKD with the specifications.

Dimensions

CAD

Body



Characteristics

Descriptions		Characteristics	
		Output shaft	Input shaft
Allowable thrust force	N	*	850
Allowable radial force	N	200	1200
Allowable bending moment	N·m	30	-
Torsion rigidity (K)	N·m/rad	15000	-
Moment of inertia	kg·m²	1.49×10^{-3}	2.09×10^{-3}

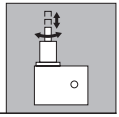
Descriptions		Characteristics
Internal frictional torque (Tin)	N·m	5
Output shaft inner weight (mo)	kg	0.8
Product weight	kg	18
Oil level	ℓ	1.0
Paint color		Silver

* Allowable output shaft thrust force is defined in the following formula.
Output shaft allowable thrust force = (allowable payload - max. payload) × 9.81 (N)

Accuracy

Descriptions		Swing direction	Descriptions		Lift direction
		Index			
Indexing accuracy	" (sec.)	±30	Stroke accuracy	mm	±0.1
Repeatability	" (sec.)	20	Repeatability	mm	±0.02
Dwell accuracy	" (sec.)	30 (60)			

Value in parentheses ( ) is when the dwell angle exceeds 90 degrees.



Output torque table

Index P&P

PPIM063 Cam curve/MS												
Index number *n*	Index angle *θh* (°)	Static rated output torque (N·m)	Dynamic rated output torque *Tr* (N·m)									
			Input shaft rotational speed *N* (rpm)									
			60	90	120	150	200	250	300	400	500	600
4	140	48.1	21.7	18.4	16.3	14.7	12.6	11.0	9.5	6.6		
	180	67.4	35.5	30.2	26.9	24.5	21.6	19.5	17.7	14.7	12.0	9.3
6	105	17.1	10.6	10.1	9.7	9.3	8.5	7.1	5.7			
	120	17.1	11.6	11.1	10.6	10.2	9.6	8.3	7.0			
	150	17.1	13.0	12.5	12.1	11.7	11.2	9.9	8.8	6.8		
	180	48.1	30.4	25.9	23.1	21.0	18.6	16.8	15.4	13.0	10.9	8.9
8	75	67.4	30.4	25.8	22.8	20.5	17.5	14.9	12.6	8.0		
	90	67.4	34.3	29.2	25.9	23.4	20.4	17.9	15.8	11.8	7.9	
	120	87.7	53.4	45.5	40.5	37.0	32.8	29.6	27.1	22.9	19.3	15.9
	150	87.7	58.6	50.0	44.6	40.8	36.2	32.9	30.4	26.3	23.0	20.1
	180	87.7	62.2	53.1	47.4	43.4	38.6	35.2	32.6	28.6	25.4	22.8
12	60	17.1	11.1	10.5	10.0	9.4	8.4	6.6				
	90	48.1	29.4	25.0	22.2	20.2	17.7	15.7	14.0	11.0	8.1	5.1
	120	48.1	32.3	27.6	24.6	22.4	19.8	17.9	16.3	13.7	11.5	9.3
	150	67.4	48.8	41.6	37.1	34.0	30.2	27.5	25.4	22.2	19.6	17.4
	180	67.4	50.0	43.3	38.6	35.4	31.5	28.8	26.6	23.4	21.0	18.9
16	90	17.1	14.8	14.2	13.7	13.4	12.8	11.4	10.1	7.9	5.8	
	120	17.1	15.9	15.3	14.8	14.5	14.0	12.6	11.5	9.7	8.0	6.4
	150	17.1	16.4	16.0	15.5	15.2	14.7	13.4	12.3	10.6	9.2	7.9
	180	17.1	16.6	16.4	16.0	15.6	15.2	13.9	12.8	11.2	9.9	8.7

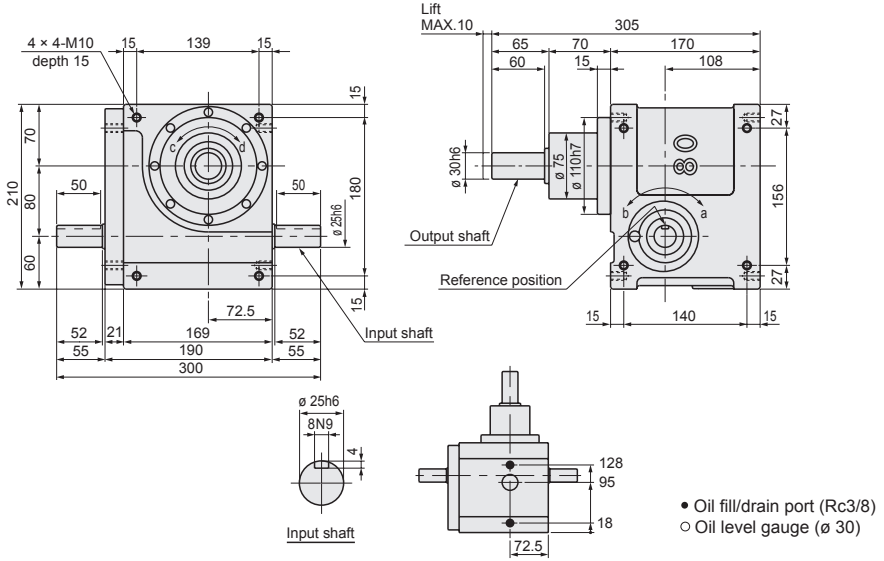
Payload table

PPIM063 Cam curve/MS											
Lift *Lo* (mm)	Index angle *θh* (°)	Rated dynamic payload *Mm* (kg)									
		Input shaft rotational speed *N* (rpm)									
		60	90	120	150	200	250	300	400	500	600
4	32	12.0	12.0	12.0	12.0	7.6	5.1	3.5	1.7	0.8	0.3
	50	12.0	12.0	12.0	12.0	12.0	11.7	8.8	5.2	3.2	2.1
	70	12.0	12.0	12.0	12.0	12.0	12.0	12.0	9.9	6.7	4.7
	90	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	10.7	7.9
	120	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
6	39	12.0	12.0	12.0	11.8	7.5	4.9	3.4	1.7	0.8	0.3
	50	12.0	12.0	12.0	12.0	11.7	8.2	5.9	3.3	1.9	1.1
	70	12.0	12.0	12.0	12.0	12.0	12.0	11.1	6.8	4.4	3.0
	90	12.0	12.0	12.0	12.0	12.0	12.0	12.0	10.8	7.4	5.2
	120	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	9.2
8	45	12.0	12.0	12.0	11.7	7.4	4.9	3.3	1.6	0.8	0.3
	60	12.0	12.0	12.0	12.0	12.0	8.7	6.3	3.6	2.1	1.2
	80	12.0	12.0	12.0	12.0	12.0	12.0	10.9	6.6	4.3	2.9
	100	12.0	12.0	12.0	12.0	12.0	12.0	12.0	10.1	6.9	4.8
	120	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	9.7	7.0
10	50	12.0	12.0	12.0	11.4	7.2	4.7	3.2	1.6	0.7	0.3
	70	12.0	12.0	12.0	12.0	12.0	9.4	6.9	3.9	2.3	1.4
	90	12.0	12.0	12.0	12.0	12.0	12.0	10.9	6.7	4.3	2.9
	120	12.0	12.0	12.0	12.0	12.0	12.0	12.0	11.4	7.9	5.6

Dimensions

CAD

Body



Characteristics

Descriptions		Characteristics	
		Output shaft	Input shaft
Allowable thrust force	N	*	1300
Allowable radial force	N	270	1700
Allowable bending moment	N·m	40	-
Torsion rigidity (K)	N·m/rad	40000	-
Moment of inertia	kg·m^2	5.31 × 10^{-3}	5.01 × 10^{-3}

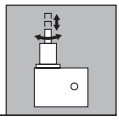
Descriptions		Characteristics
Internal frictional torque (Tin)	N·m	10
Output shaft inner weight (mo)	kg	1.6
Product weight	kg	32
Oil level	ℓ	1.8
Paint color		Silver

* Allowable output shaft thrust force is defined in the following formula.
Output shaft allowable thrust force = (allowable payload - max. payload) × 9.81 (N)

Accuracy

Descriptions		Swing direction	Descriptions		Lift direction
		Index			
Indexing accuracy	" (sec.)	±30	Stroke accuracy	mm	±0.1
Repeatability	" (sec.)	20	Repeatability	mm	±0.02
Dwell accuracy	" (sec.)	30 (60)			

Value in parentheses ( ) is when the dwell angle exceeds 90 degrees.



Output torque table

PPIM080 Cam curve/MS												
Index number *n*	Index angle *θh* (°)	Static rated output torque (N·m)	Dynamic rated output torque *Tr* (N·m)									
			Input shaft rotational speed *N* (rpm)									
			60	90	120	150	200	250	300	400	500	600
4	160	163.0	62.5	53.0	46.9	42.4	36.6	31.9	27.6	19.5		
	180	163.0	67.7	57.6	51.1	46.4	40.4	35.7	31.6	24.2	16.9	
6	120	64.8	31.3	26.3	23.0	20.4	16.7					
	150	85.8	50.0	42.5	37.6	34.0	29.4	25.7	22.4	16.1		
	180	85.8	54.7	46.5	41.3	37.6	32.9	29.3	26.2	20.7	15.4	
8	80	116.0	52.8	44.4	38.8	34.3	28.1	22.4	16.8			
	90	163.0	65.5	55.4	48.8	43.7	37.1	31.3	25.9	15.0		
	120	163.0	77.6	65.9	58.5	53.1	46.3	41.0	36.3	27.9	19.6	
	150	176.0	143	130	116	106	94.2	85.4	78.4	67.1	57.7	49.1
	180	256.0	188	161	143	131	117	106	98.2	85.8	76.0	67.5
12	60	64.8	30.1	24.9	21.1	18.0						
	90	85.8	52.9	44.8	39.6	35.6	30.5	26.2	22.2			
	120	116.0	79.1	67.4	59.9	54.6	48.0	43.0	38.9	31.7	25.1	18.5
	150	116.0	84.6	72.1	64.2	58.7	51.9	47.0	43.0	36.5	30.9	25.6
	180	163.0	99.3	85.9	76.7	70.1	62.4	56.7	52.3	45.4	39.8	34.9
16	90	68.4	42.7	36.2	32.0	28.8	24.8	21.4	18.3			
	120	90.6	65.4	55.7	49.6	45.2	39.8	35.8	32.4	26.7	21.5	16.3
	150	90.6	68.3	58.9	52.5	48.0	42.5	38.5	35.3	30.1	25.6	21.5
	180	90.6	69.7	61.1	54.5	49.9	44.3	40.3	37.1	32.2	28.2	24.6

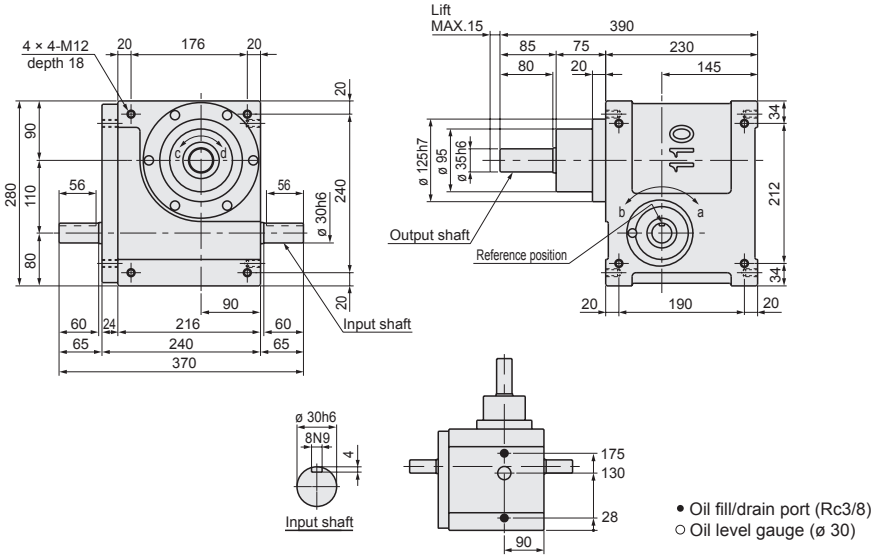
Payload table

PPIM080 Cam curve/MS											
Lift *Lo* (mm)	Index angle *θh* (°)	Rated dynamic payload *Mm* (kg)									
		Input shaft rotational speed *N* (rpm)									
		60	90	120	150	200	250	300	400	500	600
4	31	20.0	20.0	20.0	20.0	12.8	8.4	5.7	2.8	1.3	0.4
	50	20.0	20.0	20.0	20.0	20.0	20.0	15.4	9.1	5.7	3.6
	70	20.0	20.0	20.0	20.0	20.0	20.0	20.0	17.4	11.8	8.3
	90	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	18.7	13.7
	120	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
6	37	20.0	20.0	20.0	19.5	12.1	7.9	5.3	2.5	1.1	0.3
	50	20.0	20.0	20.0	20.0	20.0	14.5	10.4	5.8	3.3	1.9
	70	20.0	20.0	20.0	20.0	20.0	20.0	19.5	11.9	7.7	5.2
	90	20.0	20.0	20.0	20.0	20.0	20.0	20.0	18.9	13.0	9.2
	120	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	16.1
8	43	20.0	20.0	20.0	19.6	12.2	8.0	5.4	2.6	1.1	0.3
	60	20.0	20.0	20.0	20.0	20.0	15.5	11.3	6.3	3.7	2.2
	75	20.0	20.0	20.0	20.0	20.0	20.0	17.1	10.3	6.5	4.3
	90	20.0	20.0	20.0	20.0	20.0	20.0	20.0	14.6	9.7	6.7
	120	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	16.9	12.3
10	47	20.0	20.0	20.0	18.8	11.6	7.5	5.1	2.3	1.0	0.2
	60	20.0	20.0	20.0	20.0	18.2	12.6	8.9	4.8	2.6	1.4
	75	20.0	20.0	20.0	20.0	20.0	18.8	13.9	8.1	5.0	3.1
	90	20.0	20.0	20.0	20.0	20.0	20.0	19.3	11.8	7.6	5.1
	120	20.0	20.0	20.0	20.0	20.0	20.0	19.3	20.0	13.8	9.8

Dimensions

CAD

Body



Characteristics

Descriptions		Characteristics	
		Output shaft	Input shaft
Allowable thrust force	N	*	2800
Allowable radial force	N	300	3400
Allowable bending moment	N·m	50	-
Torsion rigidity (K)	N·m/rad	60000	-
Moment of inertia	kg·m^2	1.6 × 10^{-2}	1.2 × 10^{-2}

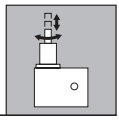
Descriptions		Characteristics
Internal frictional torque (Tin)	N·m	15
Output shaft inner weight (mo)	kg	2.9
Product weight	kg	68
Oil level	ℓ	4.0
Paint color		Silver

* Allowable output shaft thrust force is defined in the following formula.
Output shaft allowable thrust force = (allowable payload - max. payload) × 9.81 (N)

Accuracy

Descriptions		Swing direction	Descriptions		Lift direction
		Index			
Indexing accuracy	" (sec.)	±30	Stroke accuracy	mm	±0.1
Repeatability	" (sec.)	20	Repeatability	mm	±0.02
Dwell accuracy	" (sec.)	30 (60)			

Value in parentheses ( ) is when the dwell angle exceeds 90 degrees.



Output torque table

PPIM110 Cam curve/MS												
Index number *n*	Index angle *θh* (°)	Static rated output torque (N·m)	Dynamic rated output torque *Tr* (N·m)									
			Input shaft rotational speed *N* (rpm)									
			60	90	120	150	200	250	300	400	500	600
4	150	235	137.0	125.0	110.0	98.6	83.7	71.0	59.1	35.1		
	180	346	193.0	164.0	145.0	132.0	115.0	101.0	89.3	67.5	45.9	23.2
6	100	151	71.1	59.0	50.4	43.1	31.9	20.6				
	120	151	80.3	67.4	58.6	51.6	41.5	32.0	22.5			
	150	211	104.0	87.9	77.5	69.6	59.3	50.5	42.3	26.1		
	180	211	113.0	95.6	84.7	76.7	66.5	58.3	51.1	37.4	23.7	
8	75	235	132.0	119.0	103.0	90.4	72.0	54.5	36.6			
	90	374	237.0	201.0	177.0	160.0	137.0	117.0	99.4	64.3	27.0	
	120	374	278.0	237.0	210.0	191.0	167.0	149.0	133.0	105.0	78.5	51.0
	150	616	357.0	304.0	271.0	247.0	219.0	198.0	181.0	153.0	128.0	105.0
	180	616	380.0	324.0	289.0	264.0	235.0	213.0	196.0	169.0	147.0	127.0
12	60	211	88.1	72.9	61.8	52.4	37.6	22.5				
	90	211	109.0	91.8	80.6	72.0	60.2	49.9	39.9			
	120	235	203.0	185.0	165.0	150.0	132.0	118.0	106.0	85.4	66.3	47.0
	150	235	216.0	197.0	176.0	160.0	142.0	128.0	117.0	98.6	82.7	67.6
	180	346	274.0	237.0	212.0	194.0	172.0	156.0	144.0	125.0	109.0	95.0
16	90	151	104.0	88.0	77.5	69.6	59.2	50.3	41.9	25.2		
	120	151	112.0	95.2	84.4	76.6	66.7	58.9	52.1	39.7	27.4	
	150	211	132.0	114.0	101.0	92.3	81.4	73.2	66.4	54.9	44.6	34.5
	180	211	134.0	117.0	104.0	95.4	84.5	76.5	70.0	59.5	50.6	42.2

Payload table

PPIM110 Cam curve/MS											
Lift *Lo* (mm)	Index angle *θh* (°)	Rated dynamic payload *Mm* (kg)									
		Input shaft rotational speed *N* (rpm)									
		60	90	120	150	200	250	300	400	500	600
4	22	30.0	30.0	20.0	13.2	7.0	3.6	1.7			
	50	30.0	30.0	30.0	30.0	30.0	25.4	18.6	10.5	6.1	3.4
	70	30.0	30.0	30.0	30.0	30.0	30.0	30.0	21.1	13.9	9.3
	90	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	22.8	16.4
	120	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	27.9
6	27	30.0	30.0	20.0	13.3	7.0	3.6	1.7			
	50	30.0	30.0	30.0	30.0	25.6	17.6	12.3	6.2	3.1	1.2
	70	30.0	30.0	30.0	30.0	30.0	30.0	23.8	14.1	8.7	5.4
	90	30.0	30.0	30.0	30.0	30.0	30.0	30.0	23.1	15.4	10.5
	120	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	26.5	19.4
8	31	30.0	30.0	19.7	13.1	6.8	3.6	1.6			
	50	30.0	30.0	30.0	30.0	19.9	13.1	8.8	4.0	1.5	0.1
	70	30.0	30.0	30.0	30.0	30.0	25.0	18.3	10.3	5.9	3.3
	90	30.0	30.0	30.0	30.0	30.0	30.0	28.6	17.6	11.3	7.3
	120	30.0	30.0	30.0	30.0	30.0	30.0	30.0	29.5	20.5	14.5
10	34	30.0	29.6	18.9	12.5	6.5	3.3	1.4			
	60	30.0	30.0	30.0	30.0	22.6	15.2	10.4	5.0	2.2	0.6
	90	30.0	30.0	30.0	30.0	30.0	30.0	23.7	14.0	8.6	5.3
	120	30.0	30.0	30.0	30.0	30.0	30.0	30.0	24.5	16.5	11.3
12	37	30.0	29.2	18.6	12.2	6.3	3.2	1.3			
	60	30.0	30.0	30.0	30.0	19.1	12.5	8.3	3.7	1.3	
	90	30.0	30.0	30.0	30.0	30.0	27.1	20.1	11.5	6.8	3.9
	120	30.0	30.0	30.0	30.0	30.0	30.0	30.0	20.8	13.6	9.1
15	41	30.0	28.6	18.2	11.9	6.1	3.0	1.2			
	60	30.0	30.0	30.0	25.1	15.3	9.6	6.2	2.3	0.4	
	90	30.0	30.0	30.0	30.0	30.0	22.3	16.1	8.8	4.9	2.5
	120	30.0	30.0	30.0	30.0	30.0	30.0	27.4	16.7	10.6	6.8

Circular P&P drive high speed

PPIH/PPOH Series

● Shaft interval: 40, 50, 63 and 80 mm

Specifications

CAD

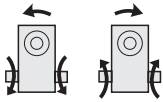
Descriptions		PPIH040/PPOH040						PPIH050/PPOH050						PPIH063/PPOH063							PPIH080/PPOH080						
Swing direction	Index specifications: Index number Note 1	2	3	4	6	8	12	2	3	4	6	8	12	2	3	4	6	8	12	16	2	3	4	6	8	12	16
	Index specifications: Min. index angle °	210	150	90	75	60	60	210	150	90	75	60	45	210	150	90	75	60	45	90	210	150	105	75	60	45	90
	Index specifications: Indexing accuracy " (sec.)	±120												±90													
	Index specifications: Repeatability " (sec.)	30																									
	Index specifications: Dwell accuracy " (sec.)	60																									
	Index specifications: Cam curve	MS curve (standard), MC curve, MT curve, Trapecloid curve																									
	Oscillator specifications: Oscillating angle °	30	45	60	90			30	45	60	90			30	45	60	90				45	60	75	90			
	Oscillator specifications: Min. index angle °	45	60	75	90			45	60	75	90			45	60	75	90				45	60	75	105			
	Oscillator specifications: Indexing accuracy " (sec.)	±120																									
	Oscillator specifications: Repeatability " (sec.)	30																									
	Oscillator specifications: Dwell accuracy " (sec.)	60																									
	Oscillator specifications: Cam curve	MS curve (standard), MC curve, MT curve, Trapecloid curve																									
Lift direction	Lift range (mm)	5 to 18						5 to 25						5 to 30							5 to 40						
	Standard lift mm	5	10	15	18			5	10	15	20	25		5	10	15	20	25	30		5	10	20	30	40		
	Min. index angle °	17	25	30	35			17	24	29	34	38		16	23	28	32	36	39		16	23	32	39	45		
	Stroke accuracy mm	±0.1	±0.2					±0.1	±0.2					±0.1	±0.2						±0.1	±0.2				±0.3	
	Repeatability mm	±0.02																									
	Cam curve	MS curve																									
Input shaft rotational speed rpm		max.600																									
Product weight kg		12						21						36							67						
Oil level ℓ		0.6						1.2						2.0							4.0						
Paint color		Silver																									

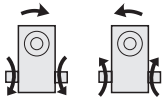
Note 1. For specifications whose index number exceeds 12 or 16, contact CKD.
Note 2. For details of accuracy, refer to the page B-30.

How to order

PPIH (A) 063 (B) - 006 (C) 010 (D) S (E) L (F) S (G) 1 (H) - X012345 (I)

(A) Model No.	(B) Shaft interval		(C) Index number (n) and oscillating angle (ψ)				(D) Lift (Lo)		(E) Cam curve		(F) Spiral direction of the cam and orbit pattern
PPIH Index P&P Motion	040	40 mm	PPIH Index number (n)		PPOH Oscillating angle (ψ)		005 to 040	5 mm to 40 mm	S	MS curve (standard)	PPIH (spiral direction of the cam)
PPOH Oscillator P & P Motion	050	50 mm	002	2	090	90°			C	MCcurve (MCV50)	L Left helix (standard)
	063	63 mm	003	3	060	60°			T	MT curve	
	080	80 mm	004	4	045	45°			P	Trapecloid curve	R Right helix
			006	6	030	30°			*	This indicates the cam curve for the swing direction. When there are more than 1 cam curve, this will be "x".	
			008	8							
			012	12							
			016	16							



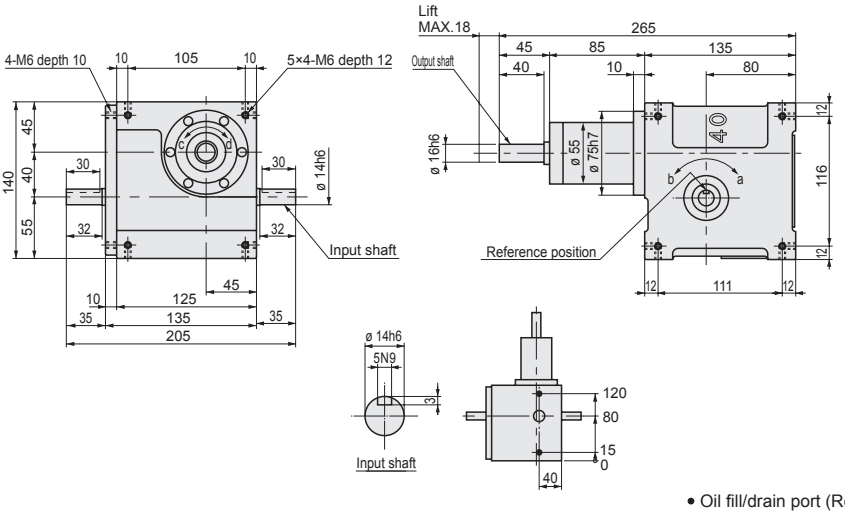


					Ⓖ Shape of the output shaft		Ⓗ Installation position		Ⓘ Special specification No.
	PPOH (orbit pattern)				S	Straight (without keyway) * For the following specifications, contact CKD. • With Torque saver	1	Position 1 Output shaft facing upward * For the position other than #1, contact CKD.	* To place an order for a P&P drive, "Special specification number" is required. The special specification model number shall be determined after a consultation with the customer. Mounting options are available upon request. Please provide CKD with the specifications.
	T	Standard	When the input shaft starts to rotate from the rotation reference point, the output shaft rotates in sequence from 1 and 2 as in the figure. Output shaft oscillation reference point Input shaft rotation Reference position (0°)						
	S	Option	Output shaft oscillation reference point Input shaft rotation Reference position (0°)						

Dimensions

CAD

Body



● Oil fill/drain port (Rc1/4)
○ Oil level gauge (ø 20)

Characteristics

Descriptions		Characteristics	
		Output shaft	Input shaft
Allowable thrust force	N	*	800
Allowable radial force	N	100	750
Allowable bending moment	N·m	8	-
Torsion rigidity (K)	N·m/rad	1200	-
Moment of inertia	kg·m²	1.32×10^{-4}	6.66×10^{-4}

Descriptions		Characteristics
Internal frictional torque (Tin)	N·m	5
Output shaft inner weight (mo)	kg	0.4
Product weight	kg	12
Oil level	ℓ	0.6
Paint color		Silver

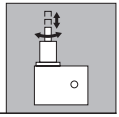
* Allowable output shaft thrust force is defined in the following formula.
Output shaft allowable thrust force = (allowable payload - max. payload) × 9.81 (N)

Accuracy

Descriptions		Swing direction	
		Index	Oscillator
Indexing accuracy	" (sec.)	±120	±120
Repeatability	" (sec.)	30	30
Dwell accuracy	" (sec.)	60	60

Descriptions		Lift direction
Stroke accuracy	mm	*
Repeatability	mm	±0.02

* Lift value 6 or less: ±0.1
Over 6 to 18: ±0.2



Output torque table

Index P&P

PPIH040 Cam curve/MS

Index number *n*	Index angle *θh* (°)	Static rated output torque (N·m)	Dynamic rated output torque *Tr* (N·m) Input shaft rotational speed *N* (rpm)									
			30	60	90	120	150	200	300	400	500	600
2	210 240	14.7 14.7	7.1 7.6	6.4 6.9	5.5 5.9	4.9 5.2	4.4 4.8	3.9 4.3	3.3 3.6	2.8 3.1	2.3 2.7	2.0 2.3
3	150 180	14.7 14.7	7.3 8.0	6.5 7.2	5.6 6.1	5.0 5.5	4.5 5.0	4.0 4.4	3.3 3.7	2.7 3.2	2.3 2.7	2.3
4	90 120 180	5.8 5.8 14.7	3.6 4.3 8.7	3.2 3.8 8.0	2.7 3.2 6.8	2.4 2.9 6.1	2.1 2.6 5.5	2.3 4.9	4.1	3.6	3.2	2.8
6	75 120 180	14.7 14.7 14.7	7.1 8.7 9.4	6.3 7.8 8.8	5.4 6.7 7.5	4.8 5.9 6.7	4.3 5.4 6.1	3.8 4.8 5.4	2.9 4.0 4.6	2.2 3.4 4.0	2.9 3.6	2.5 3.3
8	60 90 150	5.8 14.7 14.7	4.1 8.7 9.5	3.7 7.7 8.8	3.1 6.6 7.5	2.7 5.9 6.7	2.4 5.3 6.2	2.1 4.7 5.5	3.9 4.6	3.3 4.1	2.7 3.6	2.2 3.3
12	60 90 150	4.0 5.8 5.8	3.4 5.3 5.6	3.0 4.8 5.3	2.5 4.1 4.5	2.2 3.7 4.0	2.0 3.3 3.7	2.9 3.3	2.4 2.8	2.0 2.4	2.2	

Output torque table

Oscillator P&P

PPOH040 Cam curve/MS

Oscillating angle *ψ* (°)	Index angle *θh* (°)	Static rated output torque (N·m)	Dynamic rated output torque *Tr* (N·m) Input shaft rotational speed *N* (rpm)									
			30	60	90	120	150	200	300	400	500	600
30	45 60 90	11.8 14.7 14.7	5.5 8.1 8.9	4.2 6.1 6.9	3.5 5.2 5.9	3.1 4.6 5.2	2.8 4.2 4.8	2.4 3.7 4.2	2.9 3.5	2.3 3.0	2.6	2.2
45	60 90 120	14.7 14.7 14.7	6.9 8.2 8.8	5.2 6.3 6.8	4.4 5.3 5.8	3.9 4.8 5.2	3.6 4.3 4.7	3.1 3.8 4.2	3.3 3.1 3.5	2.6 3.0	2.1 2.6	2.3
60	75 90 120	14.7 14.7 14.7	6.7 7.4 8.2	5.1 5.6 6.3	4.4 4.8 5.4	3.9 4.3 4.8	3.5 3.9 4.4	3.0 3.4 3.9	2.3 2.7 3.2	2.2 2.7	2.3	
90	90 120 150	14.7 14.7 14.7	6.0 7.1 7.8	4.6 5.4 6.0	3.9 4.6 5.1	3.4 4.1 4.6	3.1 3.7 4.2	2.7 3.3 3.7	2.0 2.6 3.1	2.1 2.6	2.2	

Payload table

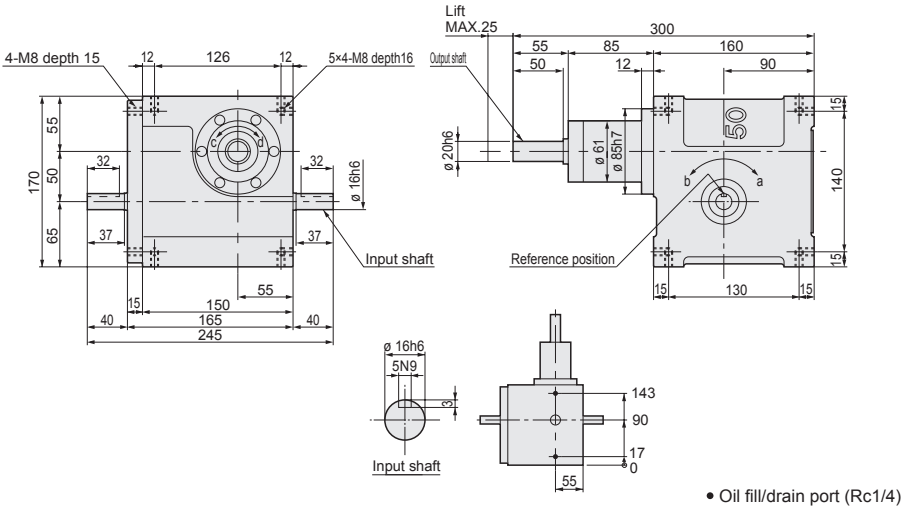
PPIH/PPOH040 Cam curve/MS

Lift *Lo* (mm)	Index angle *θh* (°)	Rated dynamic payload *Mm* (kg) Input shaft rotational speed *N* (rpm)									
		30	60	90	120	150	200	300	400	500	600
5	17 60 120	3.3 5.0 5.0	1.2 5.0 5.0	0.4 4.3 5.0	0.1 3.4 5.0	2.6 5.0	1.7 4.3	0.7 2.8	0.2 1.8	1.2	0.8
10	25 65 120	3.2 5.0 5.0	1.1 4.4 5.0	0.4 3.2 5.0	0.1 2.3 4.6	1.6 3.9	0.9 2.9	0.2 1.6	0.8	0.4	0.2
15	30 70 120	2.8 5.0 5.0	0.9 3.9 5.0	0.3 2.7 4.6	1.8 3.8	1.2 3.0	0.6 2.1	0.1 1.0	0.4	0.1	
18	35 70 120	2.9 5.0 5.0	1.0 3.4 5.0	0.3 2.3 4.3	1.4 3.4	0.9 2.6	0.4 1.7	0.7	0.3		

Dimensions

CAD

Body



• Oil fill/drain port (Rc1/4)
○ Oil level gauge (ø 20)

Characteristics

Descriptions		Characteristics	
		Output shaft	Input shaft
Allowable thrust force	N	*	1200
Allowable radial force	N	120	900
Allowable bending moment	N·m	10	-
Torsion rigidity (K)	N·m/rad	4200	-
Moment of inertia	kg·m²	5.14×10^{-4}	1.75×10^{-3}

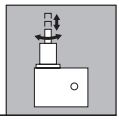
Descriptions		Characteristics
Internal frictional torque (Tin)	N·m	7
Output shaft inner weight (mo)	kg	0.8
Product weight	kg	21
Oil level	ℓ	1.2
Paint color		Silver

* Allowable output shaft thrust force is defined in the following formula.
Output shaft allowable thrust force = (allowable payload - max. payload) × 9.81 (N)

Accuracy

Descriptions		Swing direction		Descriptions		Lift direction
		Index	Oscillator			
Indexing accuracy	" (sec.)	±120	±120	Stroke accuracy	mm	*
Repeatability	" (sec.)	30	30	Repeatability	mm	±0.02
Dwell accuracy	" (sec.)	60	60			

* Lift value 6 or less: ±0.1
Over 6 to 25: ±0.2



Output torque table

Index P&P

PPIH050 Cam curve/MS

Index number *n*	Index angle *θh* (°)	Static rated output torque (N·m)	Dynamic rated output torque *Tr* (N·m) Input shaft rotational speed *N* (rpm) 30	60	90	120	150	200	300	400	500	600
2	210 240	30.9 30.9	16.7 17.9	15.0 16.3	12.8 13.9	11.4 12.3	10.3 11.3	9.1 10.0	7.4 8.2	6.0 6.9	4.8 5.8	3.6 4.7
3	150 180	30.9 30.9	17.3 18.9	15.4 17.0	13.1 14.5	11.6 12.9	10.6 11.8	9.3 10.4	7.4 8.5	5.9 7.1	4.4 5.9	4.6
4	90 120 180	14.6 18.7 30.9	6.1 9.4 20.9	5.3 8.3 19.1	4.5 7.1 16.3	3.8 6.2 14.6	3.3 5.6 13.3	4.8 11.8	3.5 9.8	8.4	7.2	6.1
6	75 120 180	30.9 30.9 30.9	16.7 20.9 22.9	14.8 18.8 21.3	12.6 16.0 18.2	11.1 14.3 16.2	10.0 13.0 14.9	8.6 11.5 13.2	6.3 9.4 11.1	4.2 7.8 9.7	6.4 8.5	5.1 7.5
8	60 90 150	18.7 30.9 30.9	9.1 20.9 23.3	8.0 18.5 21.6	6.8 15.8 18.4	5.9 14.0 16.4	5.2 12.8 15.0	4.2 11.2 13.4	9.1 11.2	7.3 9.8	5.7 8.6	4.1 7.6
12	45 90 150	7.1 14.6 18.7	5.3 8.9 12.4	4.6 8.1 11.7	3.8 6.8 10.0	3.2 6.1 8.9	5.5 8.2	4.8 7.3	3.7 6.1	5.2	4.6	4.0

Output torque table

Oscillator P&P

PPOH050 Cam curve/MS

Oscillating angle *ψ* (°)	Index angle *θh* (°)	Static rated output torque (N·m)	Dynamic rated output torque *Tr* (N·m) Input shaft rotational speed *N* (rpm) 30	60	90	120	150	200	300	400	500	600
30	45 60 90	18.7 30.9 30.9	9.0 19.4 21.7	6.8 14.8 16.8	5.7 12.5 14.3	4.9 11.1 12.7	4.2 10.0 11.6	3.3 8.7 10.3	6.6 8.4	4.8 7.0	5.8	4.5
45	60 90 120	18.7 30.9 30.9	8.6 19.8 21.3	6.5 15.0 16.6	5.5 12.8 14.1	4.7 11.4 12.6	4.1 10.3 11.5	3.3 9.1 10.2	7.2 8.4	5.7 7.1	4.2 5.9	4.8
60	75 90 120	30.9 30.9 30.9	15.9 17.6 19.8	12.0 13.4 15.3	10.2 11.4 13.0	9.0 10.1 11.6	8.1 9.1 10.5	6.8 7.9 9.3	4.8 6.0 7.5	4.4 6.1	4.9	3.6
90	90 120 150	18.7 30.9 30.9	7.5 16.8 18.7	5.6 12.8 14.4	4.7 10.9 12.2	4.1 9.6 10.9	3.6 8.7 9.9	7.6 8.7	5.9 7.1	4.4 5.8	4.6	3.4

Payload table

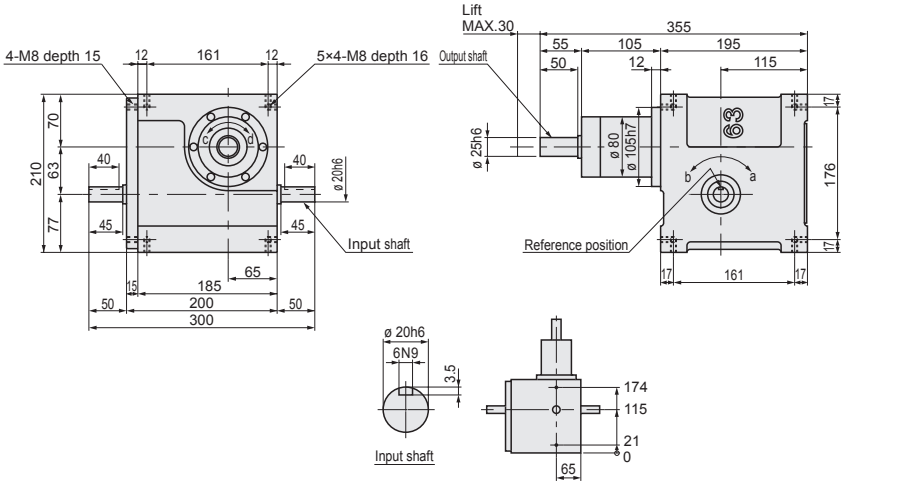
PPIH/PPOH050 Cam curve/MS

Lift *Lo* (mm)	Index angle *θh* (°)	Rated dynamic payload *Mm* (kg) Input shaft rotational speed *N* (rpm) 30	60	90	120	150	200	300	400	500	600
5	17 60 120	6.9 10.0 10.0	2.4 10.0 10.0	0.9 8.6 10.0	0.2 6.8 10.0	5.3 10.0	3.4 8.6	1.4 5.7	0.5 3.8	0.1 2.5	1.6
10	24 65 120	6.3 10.0 10.0	2.2 8.9 10.0	0.8 6.6 10.0	0.1 4.7 9.2	3.4 7.9	1.9 5.9	0.5 3.2	1.7	0.9	0.4
15	29 70 120	5.7 10.0 10.0	1.9 7.9 10.0	0.6 5.5 9.4	3.7 7.7	2.5 6.2	1.3 4.3	0.2 2.0	0.9	0.3	
20	34 70 120	5.4 10.0 10.0	1.8 6.7 10.0	0.5 4.3 8.3	2.7 6.5	1.7 5.0	0.7 3.2	1.3	0.5		
25	38 70 120	5.0 9.7 10.0	1.6 5.6 9.4	0.4 3.3 7.3	2.0 5.5	1.1 4.1	0.3 2.5	0.9	0.2		

Dimensions

CAD

Body



• Oil fill/drain port (Rc1/4)
○ Oil level gauge (ø 20)

Characteristics

Descriptions		Characteristics	
		Output shaft	Input shaft
Allowable thrust force	N	*	2000
Allowable radial force	N	200	1600
Allowable bending moment	N·m	25	-
Torsion rigidity (K)	N·m/rad	10000	-
Moment of inertia	kg·m^2	9.41 × 10^{-4}	5.62 × 10^{-3}

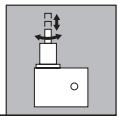
Descriptions		Characteristics
Internal frictional torque (Tin)	N·m	10
Output shaft inner weight (mo)	kg	1.6
Product weight	kg	36
Oil level	ℓ	2.0
Paint color		Silver

* Allowable output shaft thrust force is defined in the following formula.
Output shaft allowable thrust force = (allowable payload - max. payload) × 9.81 (N)

Accuracy

Descriptions		Swing direction		Descriptions		Lift direction
		Index	Oscillator			
Indexing accuracy	" (sec.)	±90	±120	Stroke accuracy	mm	*
Repeatability	" (sec.)	30	30	Repeatability	mm	±0.02
Dwell accuracy	" (sec.)	60	60			

* Lift value 6 or less: ±0.1
Over 6 to 30: ±0.2



Output torque table

Index P&P

PPIH063 Cam curve/MS												
Index number *n*	Index angle *θh* (°)	Static rated output torque (N·m)	Dynamic rated output torque *Tr* (N·m) Input shaft rotational speed *N* (rpm)									
			30	60	90	120	150	200	300	400	500	600
2	210 240	51.5 51.5	29.3 31.3	26.3 28.4	22.4 24.2	19.9 21.6	18.1 19.7	15.9 17.4	12.9 14.3	10.4 12.0	8.2 9.9	5.9 7.9
3	150 180	51.5 51.5	30.3 32.9	26.9 29.7	22.9 25.3	20.3 22.5	18.5 20.5	16.2 18.1	12.8 14.8	10.1 12.3	7.4 10.0	7.8
4	90 120 180	23.3 37.9 51.5	9.9 22.2 36.3	8.7 19.7 33.2	7.3 16.7 28.3	6.2 14.8 25.2	5.4 13.4 23.0	11.6 20.4	8.7 16.9	6.2 14.4	12.3	10.3
6	75 120 180	51.5 51.5 51.5	29.3 36.3 39.5	26.0 32.6 36.7	22.0 27.7 31.3	19.4 24.7 28.0	17.5 22.5 25.6	14.9 19.8 22.7	10.8 16.2 19.1	6.9 13.4 16.6	10.9 14.6	8.4 12.8
8	60 90 150	37.9 51.5 51.5	21.5 36.2 40.0	19.0 32.1 37.1	16.0 27.3 31.7	14.0 24.3 28.3	12.5 22.1 25.8	10.4 19.4 23.0	6.6 15.5 19.2	12.5 16.7	9.5 14.6	6.6 12.8
12	45 90 150	18.7 23.3 37.9	9.1 14.8 29.7	8.0 13.3 28.1	6.6 11.3 23.9	5.5 10.0 21.4	9.1 19.5	7.9 17.4	6.1 14.6	12.7	11.2	9.9
16	90 120 180	18.7 18.7 18.7	11.7 12.0 12.1	10.7 11.2 11.5	9.1 9.5 10.0	8.1 8.5 9.0	7.3 7.7 8.2	6.4 6.8 7.3	5.5 6.1	5.3		

Output torque table

Oscillator P&P

PPOH063 Cam curve/MS												
Oscillating angle *ψ* (°)	Index angle *θh* (°)	Static rated output torque (N·m)	Dynamic rated output torque *Tr* (N·m) Input shaft rotational speed *N* (rpm)									
			30	60	90	120	150	200	300	400	500	600
30	45 90 120	37.9 51.5 51.5	21.3 37.4 38.6	16.1 28.9 30.7	13.5 24.6 26.1	11.7 21.9 23.3	10.3 20.0 21.3	8.2 17.6 18.9	14.4 15.8	11.9 13.6	9.6 11.7	7.4 10.1
45	60 90 120	51.5 51.5 51.5	28.4 34.2 36.7	21.6 26.1 28.6	18.2 22.2 24.3	16.0 19.7 21.7	14.3 17.9 19.8	12.0 15.6 17.5	7.9 12.3 14.4	9.6 12.0	6.9 10.0	8.0
60	75 90 120	51.5 51.5 51.5	27.8 30.7 34.4	21.1 23.3 26.4	17.8 19.8 22.5	15.7 17.5 20.0	14.1 15.8 18.2	11.9 13.7 16.0	8.2 10.3 12.9	7.3 10.5	8.2	5.9
90	90 120 150	51.5 51.5 51.5	24.5 29.4 32.5	18.6 22.3 25.0	15.7 19.0 21.3	13.8 16.8 18.9	12.3 15.2 17.2	10.3 13.2 15.1	6.7 10.1 12.2	7.4 9.9	7.7	5.5

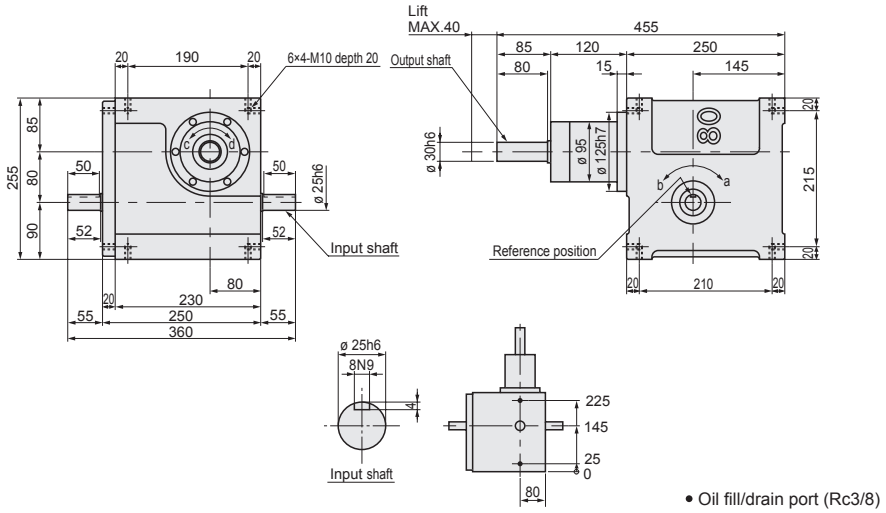
Payload table

PPIH/PPOH063 Cam curve/MS											
Lift *Lo* (mm)	Index angle *θh* (°)	Rated dynamic payload *Mm* (kg) Input shaft rotational speed *N* (rpm)									
		30	60	90	120	150	200	300	400	500	600
5	16 60 120	12.3 20.0 20.0	4.0 19.6 20.0	1.3 16.1 20.0	0.1 12.7 20.0	9.8 19.4	6.4 16.1	2.6 10.7	0.9 7.0	4.5	2.9
10	23 65 120	11.8 20.0 20.0	3.9 16.8 20.0	1.2 12.4 20.0	0.1 8.9 17.3	6.3 14.7	3.5 11.0	0.9 5.9	3.2	1.7	0.7
15	28 70 120	11.0 20.0 20.0	3.5 15.0 20.0	1.0 10.4 17.6	7.1 14.5	4.7 11.7	2.4 8.0	0.3 3.8	1.7	0.5	
20	32 70 120	10.3 20.0 20.0	3.2 12.9 19.2	0.8 8.3 15.7	5.2 12.3	3.3 9.5	1.4 6.1	2.5	0.8		
25	36 70 120	9.8 18.9 20.0	3.0 11.1 18.0	0.7 6.6 14.0	3.9 10.5	2.2 7.8	0.7 4.8	1.6	0.3		
30	39 70 120	9.0 17.5 20.0	2.6 9.5 16.7	0.5 5.3 12.5	2.9 9.1	1.5 6.5	0.2 3.7	1.0			

Dimensions

CAD

Body



Characteristics

Descriptions		Characteristics	
		Output shaft	Input shaft
Allowable thrust force	N	*	2500
Allowable radial force	N	300	2700
Allowable bending moment	N·m	40	-
Torsion rigidity (K)	N·m/rad	20000	-
Moment of inertia	kg·m^2	3.59 × 10^{-3}	1.64 × 10^{-2}

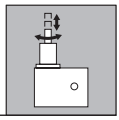
Descriptions		Characteristics
Internal frictional torque (Tin)	N·m	15
Output shaft inner weight (mo)	kg	2.9
Product weight	kg	67
Oil level	ℓ	4.0
Paint color		Silver

* Allowable output shaft thrust force is defined in the following formula.
Output shaft allowable thrust force = (allowable payload - max. payload) × 9.81 (N)

Accuracy

Descriptions		Swing direction		Descriptions		Lift direction
		Index	Oscillator			
Indexing accuracy	" (sec.)	±90	±120	Stroke accuracy	mm	*
Repeatability	" (sec.)	30	30	Repeatability	mm	±0.02
Dwell accuracy	" (sec.)	60	60			

* Lift value 6 or less: ±0.1
more than 6 and 30 or less: ±0.2
more than 30 and 40 or less: ±0.3



Output torque table

Index P&P

PPIH080 Cam curve/MS

Index number *n*	Index angle: *θh* (°)	Static rated output torque (N·m)	Dynamic rated output torque *Tr* (N·m) Input shaft rotational speed *N* (rpm)									
			30	60	90	120	150	200	300	400	500	600
2	210 240	129.0 129.0	56.5 60.9	50.6 55.3	43.0 47.0	38.1 41.8	34.5 38.0	29.9 33.2	22.9 26.4	16.8 20.7	15.3	
3	150 180	129.0 140.0	58.7 101.0	52.0 96.6	44.1 88.2	39.0 78.6	35.2 71.6	30.2 63.2	22.4 51.6	15.1 42.7	34.8	27.0
4	105 120 180	67.4 67.4 129.0	36.4 39.7 72.5	32.1 35.1 66.2	27.0 29.6 56.3	23.4 26.0 50.1	20.6 23.1 45.7	16.6 19.2 40.2	32.5	26.5	21.0	15.5
6	75 120 180	129.0 140.0 140.0	56.8 114.0 126.0	50.2 108.0 124.0	42.2 98.5 114.0	36.9 87.7 101.0	32.7 80.0 92.7	26.8 70.5 82.4	16.0 57.5 69.2	47.6 60.1	38.7 52.9	30.0 46.6
8	60 90 150	91.5 129.0 140.0	51.2 72.2 129.0	45.1 64.0 126.0	37.8 54.3 115.0	32.8 48.1 103.0	28.7 43.5 94.0	22.8 37.6 83.5	28.6 70.0	20.5 60.8	53.3	46.8
12	45 90 150	26.8 67.4 67.4	18.7 52.3 55.4	17.1 47.0 52.3	15.7 40.0 44.6	35.4 39.8	32.1 36.3	27.8 32.1	21.4 26.6	15.7 22.6	19.1	15.8
16	90 120 180	26.8 26.8 26.8	25.4 26.0 26.4	24.4 25.7 26.4	23.4 24.7 26.1	22.6 23.9 25.4	21.9 23.3 24.9	20.7 22.4 24.1	18.3 20.7 22.8	18.0 20.7	18.2	15.9

Output torque table

Oscillator P&P

PPOH080 Cam curve/MS

Oscillating angle *ψ* (°)	Index angle: *θh* (°)	Static rated output torque (N·m)	Dynamic rated output torque *Tr* (N·m) Input shaft rotational speed *N* (rpm)									
			30	60	90	120	150	200	300	400	500	600
30	45 90 120	67.4 140.0 140.0	38.2 126.0 132.0	28.6 105.0 112.0	23.6 89.2 95.6	19.9 79.4 85.3	16.6 72.4 77.9	63.9 69.2	52.1 57.7	43.2 49.7	35.2 43.1	27.4 37.1
45	60 90 120	129.0 140.0 140.0	55.3 113.0 123.0	41.8 92.7 103.0	35.0 78.8 87.8	30.2 70.0 78.2	26.4 63.5 71.4	20.7 55.5 63.1	43.9 51.9	34.1 43.5	24.7 36.2	29.1
60	75 90 120	129.0 140.0 140.0	53.8 99.8 114.0	40.7 81.4 93.9	34.1 69.0 79.9	29.6 61.1 71.1	26.0 55.2 64.7	20.8 47.7 56.9	36.0 45.9	25.4 37.3	29.2	21.1
90	105 120 150	129.0 129.0 140.0	52.3 57.1 106.0	39.7 43.4 87.9	33.4 36.7 74.8	29.2 32.3 66.5	25.9 28.9 60.5	21.3 24.4 53.2	16.8 42.9	34.7	27.0	19.4

Payload table

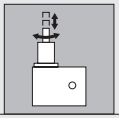
PPIH/PPOH080 Cam curve/MS

Lift *Lo* (mm)	Index angle: *θh* (°)	Rated dynamic payload *Mm* (kg) Input shaft rotational speed *N* (rpm)									
		30	60	90	120	150	200	300	400	500	600
5	16 60 120	25.9 30.0 30.0	9.6 30.0 30.0	3.6 30.0 30.0	0.9 28.3 30.0	22.1 30.0	14.6 30.0	6.5 24.0	2.7 15.9	0.8 10.6	7.1
10	23 65 120	25.2 30.0 30.0	9.4 30.0 30.0	3.5 27.8 30.0	0.9 20.1 30.0	14.5 30.0	8.4 24.6	2.7 13.7	0.4 7.7	4.3	2.3
20	32 70 120	22.7 30.0 30.0	8.1 29.3 30.0	2.8 19.1 30.0	0.5 12.3 27.8	8.0 21.6	3.8 14.2	0.2 6.2	2.6	0.7	
30	39 70 120	20.6 30.0 30.0	7.1 22.3 30.0	2.3 12.9 28.6	0.1 7.5 21.0	4.3 15.4	1.4 9.2	3.2	0.6		
40	45 75 120	18.8 30.0 30.0	6.3 19.0 30.0	1.8 10.4 23.4	5.6 16.2	2.9 11.2	0.5 6.1	1.5			

MEMO

Circular P&P drive standard

PPIX/PPOX Series



● Difference between shafts: 50, 63, 80, 110, 140, 180 mm

Specifications

CAD

Descriptions			PPIX050/PPOX050					PPIX063/PPOX063					PPIX080/PPOX080				
Swing direction	Index specifications	Index number	2	3	4	6	8	2	3	4	6	8	2	3	4	6	8
		Min. index angle °	120	90	60	45	35	120	90	60	45	35	120	90	60	45	35
		Indexing accuracy	±120														
		Repeatability " (sec.)	30														
		Dwell accuracy " (sec.)	60														
		Cam curve " (sec.)	MS curve (standard), MC curve, MT curve, Trapecloid curve														
	Oscillator specifications	Oscillating angle °	30	45	60	90	120	180	30	45	60	90	120	180	30	45	60	90	120	180
		Min. index angle °	30	35	45	60	90	120	30	35	45	60	90	120	30	35	45	60	90	120
		Indexing accuracy" (sec.)	±120														
		Repeatability " (sec.)	30														
		Dwell accuracy " (sec.)	60														
		Cam curve	MS curve (standard), MC curve, MT curve, Trapecloid curve														
Lift direction		Lift range mm	5 to 18					5 to 25					5 to 30				
		Standard lift mm	5	10	15	18		5	10	15	20	25	5	10	15	20	25	30
		Min. index angle °	24	33	40	44		20	28	35	40	45	19	26	32	38	42	46
		Stroke accuracy mm	±0.1	±0.2				±0.1	±0.2				±0.1	±0.2				
		Repeatability mm	±0.05														
		Cam curve	MS curve														
Input shaft rotational speed[Note 1] rpm			max.120														
Product weight kg			8					15					25				
Oil level ℓ			0.3					0.5					1.0				
Paint color			Silver														

Descriptions			PPIX110/PPOX110					PPIX140/PPOX140					PPIX180/PPOX180				
Swing direction	Index specifications	Index number	2	3	4	6	8	2	3	4	6	8	2	3	4	6	8
		Min. index angle °	120	90	60	45	35	120	90	60	45	35	120	90	60	45	35
		Indexing accuracy" (sec.)	±120														
		Repeatability " (sec.)	30														
		Dwell accuracy " (sec.)	60														
		Cam curve	MS curve (standard), MC curve, MT curve, Trapecloid curve														
	Oscillator specifications	Oscillating angle °	30	45	60	90	120	180	30	45	60	90	120	180	30	45	60	90	120	180
		Min. index angle °	30	35	45	60	90	120	30	35	45	60	90	120	30	35	45	60	90	120
		Indexing accuracy" (sec.)	±120														
		Repeatability " (sec.)	30														
		Dwell accuracy " (sec.)	60														
		Cam curve	MS curve (standard), MC curve, MT curve, Trapecloid curve														
Lift direction		Lift range mm	10 to 40					10 to 50					10 to 70				
		Standard lift mm	10	20	30	40		10	20	30	40	50	10	20	30	40	50	60	70
		Min. index angle °	25	35	41	47		20	30	35	40	45	18	26	31	36	40	44	48
		Stroke accuracy mm	±0.2			±0.3		±0.2			±0.3		±0.2			±0.3			
		Repeatability mm	±0.05														
		Cam curve	MS curve														
Input shaft rotational speed[Note 1] rpm			max.120					max.80					max.60				
Product weight kg			50					90					185				
Oil level ℓ			2.0					4.0					8.0				
Paint color			Silver														

Note 1. For speed exceeding the specifications, contact us.

Note 2. For details of accuracy, refer to the page B-30.

Circular P&P drive standard

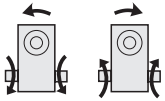
PPIX/PPOX Series

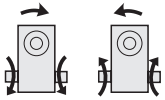
● Difference between shafts: 50, 63, 80, 110, 140, 180 mm

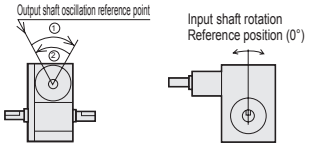
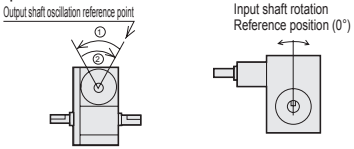
How to order

PPOX (A) 080 (B) - 060 (C) 030 (D) S (E) T (F) S (G) 1 (H) - X012345 (I)

(A) Model No.	(B) RO Shaft interval		(C) Index number (n) and oscillating angle (ψ)				(D) Lift (*Lo*)		(E) Cam curve		(F) Spiral direction of the cam and orbit pattern	
PPIX Index P&P Motion PPOX Oscillator P&P Motion	050 063 080 110 140 180	50 mm 63 mm 80 mm 110 mm 140 mm 180 mm	PPIX Index number (*n*)		PPOX Oscillating angle (ψ)		005 to 070	5 mm to 70 mm	S	MS curve (standard)	PPIX (spiral direction of the cam)	
			002	2	180	180°			C	MC curve (MCV50)	L	Left helix (standard)
			003	3	120	120°			T	MT curve		
			004	4	090	90°			P	Trapecloid curve		
			006	6	060	60°			*	This indicates the cam curve for the swing direction. When there are more than 1 cam curve, this will be "x".	R	Right helix
			008	8	045	45°						
					030	30°						



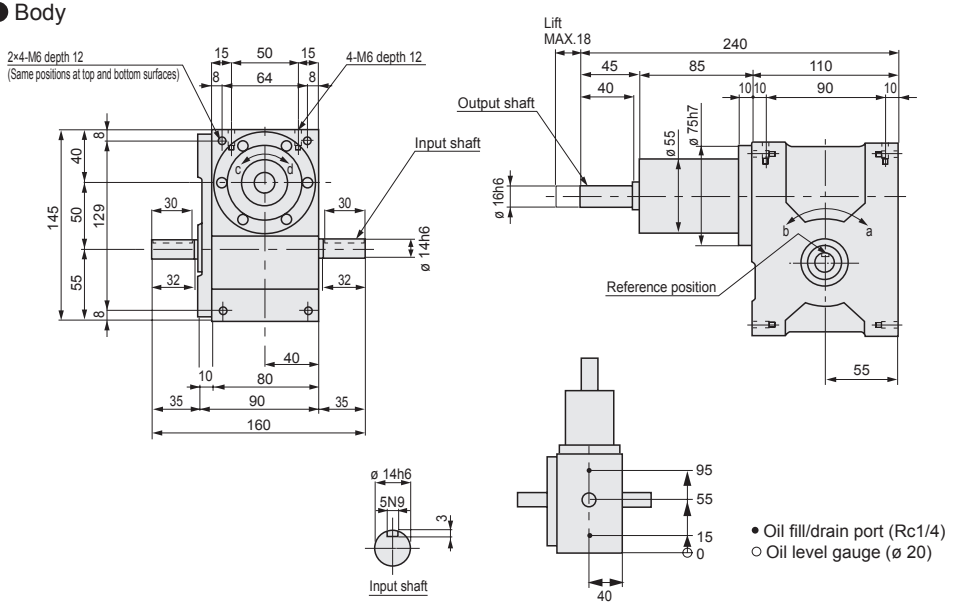


			G Shape of the output shaft		H Installation position		I Special specification No.
	PPOX (orbit pattern)		S	Straight (without keyway) * For the following specifications, contact CKD. • Hollow hole specification • With Torque saver	1	Position 1 Output shaft facing upward * For the position other than #1, contact CKD.	* To place an order for a P&P drive, "Special specification number" is required. The special specification model number shall be determined after a consultation with the customer. Mounting options are available upon request. Please provide CKD with the specifications.
	T	Standard When the input shaft starts to rotate from the rotation reference point, the output shaft rotates in sequence from 1 and 2 as in the figure. 					
	S	Option 					

Dimensions

CAD

Body



Characteristics

Descriptions		Characteristics	
		Output shaft	Input shaft
Allowable thrust force	N	*	1000
Allowable radial force	N	150	900
Allowable bending moment	N·m	10	-
Torsion rigidity (K)	N·m/rad	1200	-
Moment of inertia	kg·m^2	1.32 × 10^{-4}	6.86 × 10^{-4}

Descriptions		Characteristics
Internal frictional torque (Tin)	N·m	5
Output shaft inner weight (mo)	kg	0.4
Product weight	kg	8
Oil level	ℓ	0.3
Paint color		Silver

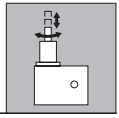
* Allowable output shaft thrust force is defined in the following formula.
Output shaft allowable thrust force = (allowable payload - max. payload) × 9.81 (N)

Accuracy

Descriptions		Index	
		Swing direction	Oscillator
Indexing accuracy	" (sec.)	±120	±120
Repeatability	" (sec.)	30	30
Dwell accuracy	" (sec.)	60	60

Descriptions		Lift direction
Stroke accuracy	mm	*
Repeatability	mm	±0.05

* Lift value 6 or less: ±0.1
Over 6 to 18: ±0.2



Output torque table

Index P&P

PPIX050 Cam curve/MS

Index number n (°)	Index angle: θh (°)	Static rated output torque (N·m)	Dynamic rated output torque Tr (N·m) Input shaft rotational speed N (rpm) 20	30	40	50	60	80	100	120
2	120	11.8	4.8	4.7	4.5	4.4	4.1	3.7	3.4	3.1
	150	14.7	7.2	7.0	6.8	6.7	6.2	5.6	5.1	4.7
3	90	14.7	6.7	6.5	6.3	6.2	5.7	5.1	4.6	4.3
	120	14.7	7.8	7.6	7.4	7.3	6.8	6.0	5.5	5.1
	150	14.7	8.4	8.4	8.2	8.0	7.5	6.7	6.1	5.7
4	60	4.0	2.4	2.3	2.3	2.2	2.0	1.8	1.6	1.4
	75	5.8	4.0	3.8	3.8	3.7	3.4	3.0	2.7	2.5
	90	11.8	6.0	5.8	5.6	5.5	5.1	4.6	4.2	3.8
6	45	14.7	6.5	6.2	6.1	5.9	5.5	4.9	4.4	4.1
	60	14.7	7.6	7.4	7.2	7.0	6.5	5.8	5.3	4.9
	75	14.7	8.4	8.1	7.9	7.8	7.2	6.4	5.9	5.5
8	35	5.8	3.7	3.6	3.5	3.4	3.1	2.8	2.5	2.2
	45	11.8	5.8	5.6	5.4	5.3	4.9	4.4	4.0	3.7
	60	11.8	6.6	6.3	6.2	6.0	5.6	5.0	4.6	4.2

Output torque table

Oscillator P&P

PPOX050 Cam curve/MS

Oscillating angle ψ (°)	Index angle: θh (°)	Static rated output torque (N·m)	Dynamic rated output torque Tr (N·m) Input shaft rotational speed N (rpm) 20	30	40	50	60	80	100	120
30	30	11.8	5.7	5.2	4.6	4.2	3.9	3.5	3.1	2.8
	45	14.7	8.7	8.0	7.1	6.5	6.1	5.4	4.9	4.6
	60	14.7	9.3	8.6	7.7	7.1	6.6	5.9	5.4	5.0
45	35	11.8	5.0	4.6	4.1	3.7	3.5	3.0	2.7	2.4
	45	14.7	7.5	6.9	6.1	5.6	5.2	4.6	4.2	3.9
	60	14.7	8.5	7.8	7.0	6.4	5.9	5.3	4.8	4.5
60	45	14.7	6.5	5.9	5.3	4.8	4.5	4.0	3.6	3.3
	60	14.7	7.6	7.0	6.2	5.7	5.3	4.7	4.3	4.0
	75	14.7	8.4	7.7	6.9	6.3	5.9	5.2	4.8	4.4
90	60	11.8	4.7	4.3	3.8	3.5	3.2	2.9	2.6	2.3
	75	14.7	7.1	6.4	5.7	5.3	4.9	4.4	4.0	3.7
	90	14.7	7.8	7.1	6.4	5.8	5.4	4.8	4.4	4.1
120	90	14.7	6.7	6.1	5.5	5.0	4.6	4.1	3.8	3.5
	120	14.7	7.8	7.2	6.4	5.9	5.5	4.9	4.5	4.1
	150	14.7	8.4	7.9	7.1	6.5	6.1	5.4	5.0	4.6
180	120	11.8	4.8	4.4	3.9	3.6	3.4	3.0	2.7	2.5
	150	14.7	7.2	6.6	5.9	5.4	5.1	4.5	4.1	3.8

Payload table

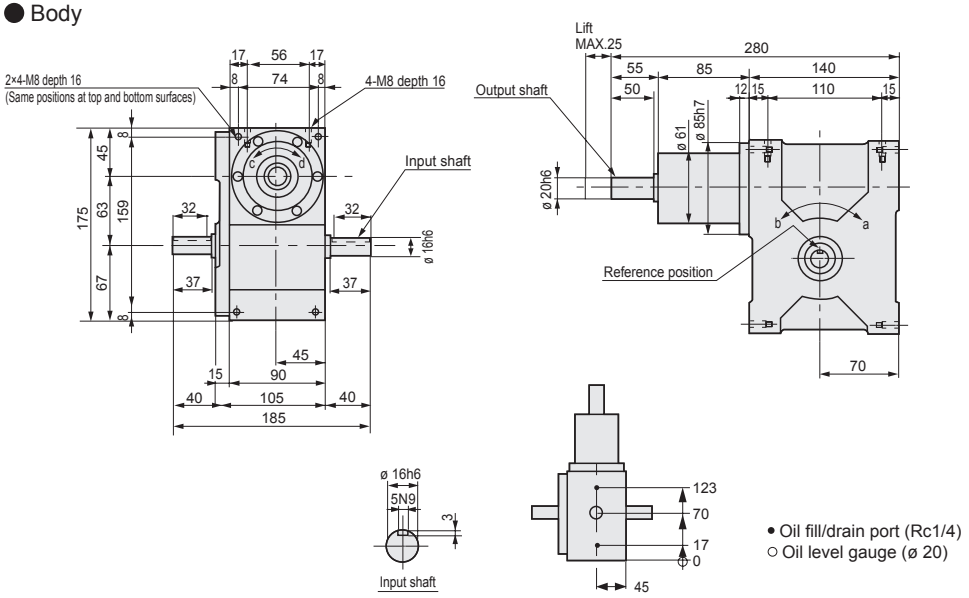
PPIX/PPOX050 Cam curve/MS

Lift Lo (mm)	Index angle: θh (°)	Rated dynamic payload Mm (kg) Input shaft rotational speed N (rpm) 20	30	40	50	60	80	100	120
5	24	3.4	2.7	2.2	1.7	1.4	0.9	0.5	0.3
	30	3.5	2.9	2.4	2.0	1.7	1.2	0.8	0.5
	40	3.7	3.1	2.7	2.3	2.1	1.6	1.2	0.9
10	33	3.2	2.5	2.0	1.6	1.2	0.7	0.4	0.2
	40	3.4	2.7	2.3	1.9	1.5	1.0	0.7	0.4
	50	3.5	2.9	2.5	2.2	1.9	1.4	1.0	0.7
15	40	3.0	2.3	1.9	1.5	1.1	0.7	0.4	0.2
	50	3.2	2.7	2.2	1.8	1.5	1.0	0.7	0.4
	60	3.4	2.8	2.4	2.1	1.8	1.3	0.9	0.6
18	44	2.9	2.3	1.8	1.4	1.1	0.7	0.4	0.2
	50	3.1	2.5	2.0	1.6	1.3	0.8	0.5	0.3
	60	3.3	2.7	2.3	1.9	1.6	1.1	0.8	0.5

Dimensions

CAD

Body



Characteristics

Descriptions		Characteristics	
		Output shaft	Input shaft
Allowable thrust force	N	*	1500
Allowable radial force	N	190	1100
Allowable bending moment	N·m	15	-
Torsion rigidity (K)	N·m/rad	4200	-
Moment of inertia	kg·m^2	5.14 × 10^{-4}	2.19 × 10^{-3}

Descriptions		Characteristics
Internal frictional torque (Tin)	N·m	7
Output shaft inner weight (mo)	kg	0.8
Product weight	kg	15
Oil level	ℓ	0.5
Paint color		Silver

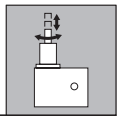
* Allowable output shaft thrust force is defined in the following formula.
Output shaft allowable thrust force = (allowable payload - max. payload) × 9.81 (N)

Accuracy

Descriptions		Swing direction	
		Index	Oscillator
Indexing accuracy	" (sec.)	±120	±120
Repeatability	" (sec.)	30	30
Dwell accuracy	" (sec.)	60	60

Descriptions		Lift direction
Stroke accuracy	mm	*
Repeatability	mm	±0.05

* Lift value 6 or less: ±0.1
Over 6 to 25: ±0.2



Output torque table

Index P&P

PPIX063 Cam curve/MS

Index number *n* (°)	Index angle: *θh* (°)	Static rated output torque (N·m)	Dynamic rated output torque *Tr* (N·m) Input shaft rotational speed *N* (rpm) 20	30	40	50	60	80	100	120
2	120	18.7	7.9	7.6	7.4	7.3	6.7	6.0	5.4	4.9
	150	30.9	17.0	16.7	16.2	15.9	14.8	13.2	12.0	11.1
3	90	30.9	15.9	15.3	14.9	14.6	13.5	12.0	10.9	10.0
	120	30.9	18.6	18.2	17.7	17.4	16.2	14.4	13.1	12.2
	150	30.9	20.3	20.3	19.7	19.3	18.0	16.1	14.7	13.6
4	60	14.6	5.9	5.7	5.5	5.3	4.9	4.3	3.7	3.2
	75	14.6	6.8	6.5	6.3	6.2	5.7	5.0	4.5	4.1
	90	18.7	9.8	9.5	9.2	9.0	8.4	7.4	6.7	6.2
6	45	30.9	15.4	14.8	14.4	14.0	13.0	11.5	10.3	9.3
	60	30.9	18.3	17.6	17.2	16.8	15.6	13.9	12.6	11.6
	75	30.9	20.3	19.6	19.1	18.7	17.4	15.5	14.1	13.1
8	35	14.6	6.3	6.0	5.8	5.7	5.2	4.4	3.8	3.2
	45	18.7	9.5	9.2	8.9	8.7	8.0	7.1	6.3	5.7
	60	18.7	10.8	10.4	10.1	9.9	9.2	8.1	7.4	6.8

Output torque table

Oscillator P&P

PPOX063 Cam curve/MS

Oscillating angle *ψ* (°)	Index angle: *θh* (°)	Static rated output torque (N·m)	Dynamic rated output torque *Tr* (N·m) Input shaft rotational speed *N* (rpm) 20	30	40	50	60	80	100	120
30	30	18.7	9.3	8.5	7.5	6.9	6.3	5.5	4.8	4.1
	45	30.9	21.2	19.3	17.3	15.8	14.7	13.0	11.9	10.9
	60	30.9	22.8	21.1	18.9	17.3	16.1	14.3	13.1	12.1
45	35	18.7	8.3	7.5	6.7	6.0	5.5	4.7	4.1	3.5
	45	30.9	18.1	16.5	14.7	13.4	12.5	11.0	9.9	9.1
	60	30.9	20.7	18.8	16.8	15.4	14.3	12.7	11.6	10.7
60	45	30.9	15.4	14.0	12.5	11.4	10.5	9.3	8.3	7.4
	60	30.9	18.3	16.7	14.9	13.6	12.7	11.2	10.2	9.3
	75	30.9	20.3	18.6	16.6	15.2	14.1	12.6	11.5	10.6
90	60	30.9	14.4	13.1	11.7	10.7	9.9	8.7	7.8	7.0
	75	30.9	16.8	15.3	13.6	12.5	11.6	10.3	9.3	8.5
	90	30.9	18.6	17.0	15.2	13.9	12.9	11.5	10.5	9.6
120	90	30.9	15.9	14.5	12.9	11.8	11.0	9.7	8.8	8.1
	120	30.9	18.6	17.2	15.4	14.1	13.1	11.7	10.6	9.8
	150	30.9	20.3	19.2	17.1	15.7	14.6	13.0	11.9	11.0
180	120	18.7	7.9	7.2	6.5	5.9	5.5	4.8	4.3	3.9
	150	30.9	17.0	15.8	14.1	12.9	12.0	10.7	9.7	9.0

Payload table

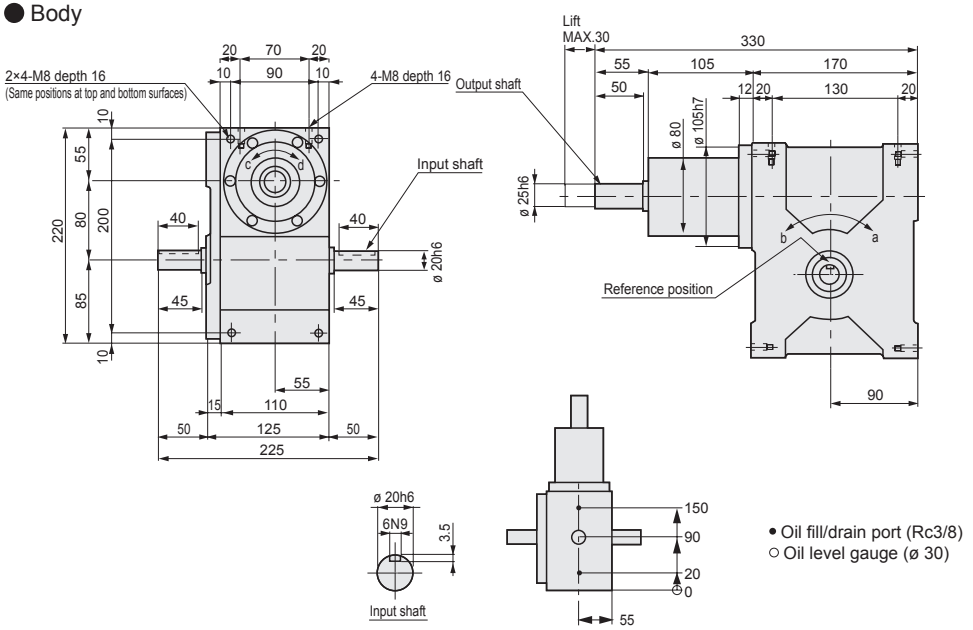
PPIX/PPOX063 Cam curve/MS

Lift *Lo* (mm)	Index angle: *θh* (°)	Rated dynamic payload *Mm* (kg) Input shaft rotational speed *N* (rpm) 20	30	40	50	60	80	100	120
5	20	6.0	4.6	3.5	2.7	2.0	1.1	0.5	0.1
	25	6.4	5.1	4.1	3.3	2.7	1.7	1.0	0.5
	35	6.7	5.6	4.8	4.1	3.5	2.6	1.8	1.3
10	28	5.7	4.3	3.3	2.5	1.9	1.0	0.4	0.1
	35	6.2	4.9	4.0	3.2	2.5	1.6	0.9	0.5
	40	6.4	5.2	4.3	3.5	2.9	1.9	1.2	0.8
15	35	5.5	4.2	3.2	2.4	1.8	1.0	0.4	0.1
	40	5.8	4.6	3.6	2.8	2.2	1.3	0.7	0.3
	50	6.2	5.1	4.2	3.5	2.9	1.9	1.2	0.8
20	40	5.2	3.9	3.0	2.3	1.7	0.9	0.3	-
	45	5.5	4.3	3.4	2.6	2.0	1.2	0.6	0.2
	55	6.0	4.8	4.0	3.3	2.7	1.7	1.1	0.6
25	45	5.0	3.8	2.9	2.2	1.6	0.8	0.3	-
	50	5.3	4.1	3.2	2.5	1.9	1.1	0.5	0.2
	60	5.8	4.6	3.8	3.1	2.5	1.6	1.0	0.5

Dimensions

CAD

Body



Characteristics

Descriptions		Characteristics	
		Output shaft	Input shaft
Allowable thrust force	N	*	2700
Allowable radial force	N	280	2200
Allowable bending moment	N·m	40	-
Torsion rigidity (K)	N·m/rad	10000	-
Moment of inertia	kg·m^2	9.41 × 10^{-4}	7.4 × 10^{-3}

Descriptions		Characteristics
Internal frictional torque (Tin)	N·m	10
Output shaft inner weight (mo)	kg	1.6
Product weight	kg	25
Oil level	ℓ	1.0
Paint color		Silver

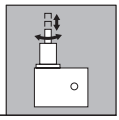
* Allowable output shaft thrust force is defined in the following formula.
Output shaft allowable thrust force = (allowable payload - max. payload) × 9.81 (N)

Accuracy

Descriptions		Swing direction	
		Index	Oscillator
Indexing accuracy	" (sec.)	±120	±120
Repeatability	" (sec.)	30	30
Dwell accuracy	" (sec.)	60	60

Descriptions		Lift direction
Stroke accuracy	mm	*
Repeatability	mm	±0.05

* Lift value 6 or less: ±0.1
Over 6 to 30: ±0.2



Output torque table

Index P&P

PPIX080 Cam curve/MS

Index number *n* (°)	Index angle: *θh* (°)	Static rated output torque (N·m)	Dynamic rated output torque *Tr* (N·m) Input shaft rotational speed *N* (rpm) 20	30	40	50	60	80	100	120
2	120	51.5	26.3	25.3	24.7	24.1	22.4	19.9	18.1	16.7
	150	51.5	29.9	29.3	28.6	28.0	26.0	23.2	21.1	19.6
3	90	51.5	28.0	26.9	26.2	25.7	23.8	21.2	19.2	17.7
	120	51.5	32.6	31.8	31.0	30.4	28.3	25.2	23.0	21.3
	150	51.5	35.3	35.3	34.4	33.7	31.3	27.9	25.6	23.7
4	60	23.3	9.7	9.3	9.1	8.8	8.1	7.0	6.1	5.3
	75	37.9	21.1	20.3	19.8	19.3	18.0	15.9	14.4	13.1
	90	37.9	23.3	22.5	21.9	21.4	19.9	17.7	16.1	14.8
6	45	51.5	27.1	26.1	25.3	24.7	22.9	20.2	18.2	16.5
	60	51.5	32.0	30.8	30.0	29.4	27.3	24.2	22.0	20.2
	75	51.5	35.3	34.2	33.3	32.6	30.3	27.0	24.6	22.7
8	35	23.3	10.4	10.0	9.7	9.4	8.6	7.3	6.2	5.2
	45	37.9	22.6	21.8	21.2	20.7	19.2	16.9	15.3	13.9
	60	37.9	25.7	24.8	24.1	23.6	21.9	19.5	17.7	16.3

Output torque table

Oscillator P&P

PPOX080 Cam curve/MS

Oscillating angle *ψ* (°)	Index angle: *θh* (°)	Static rated output torque (N·m)	Dynamic rated output torque *Tr* (N·m) Input shaft rotational speed *N* (rpm) 20	30	40	50	60	80	100	120
30	30	37.9	22.2	20.2	18.0	16.4	15.1	13.2	11.7	10.4
	45	51.5	36.7	33.5	29.9	27.4	25.4	22.6	20.5	18.9
	60	51.5	39.3	36.4	32.5	29.8	27.7	24.7	22.5	20.8
45	35	37.9	19.6	17.8	15.8	14.4	13.3	11.5	10.1	8.8
	45	51.5	31.6	28.8	25.7	23.5	21.8	19.3	17.4	15.8
	60	51.5	35.9	32.7	29.2	26.8	24.9	22.1	20.1	18.5
60	45	51.5	27.1	24.7	22.0	20.1	18.6	16.3	14.6	13.1
	60	51.5	32.0	29.2	26.1	23.8	22.1	19.6	17.8	16.3
	75	51.5	35.3	32.3	28.9	26.4	24.6	21.9	19.9	18.4
90	60	51.5	25.5	23.2	20.7	18.9	17.5	15.4	13.8	12.5
	75	51.5	29.5	26.9	24.0	21.9	20.4	18.1	16.4	15.0
	90	51.5	32.6	29.8	26.6	24.3	22.6	20.1	18.3	16.9
120	90	51.5	28.0	25.5	22.8	20.8	19.3	17.1	15.5	14.2
	120	51.5	32.6	30.2	26.9	24.7	22.9	20.4	18.6	17.2
	150	51.5	35.3	33.4	29.8	27.3	25.4	22.7	20.7	19.2
180	120	51.5	26.3	24.0	21.4	19.6	18.2	16.1	14.6	13.4
	150	51.5	29.9	27.8	24.8	22.7	21.1	18.8	17.1	15.8

Payload table

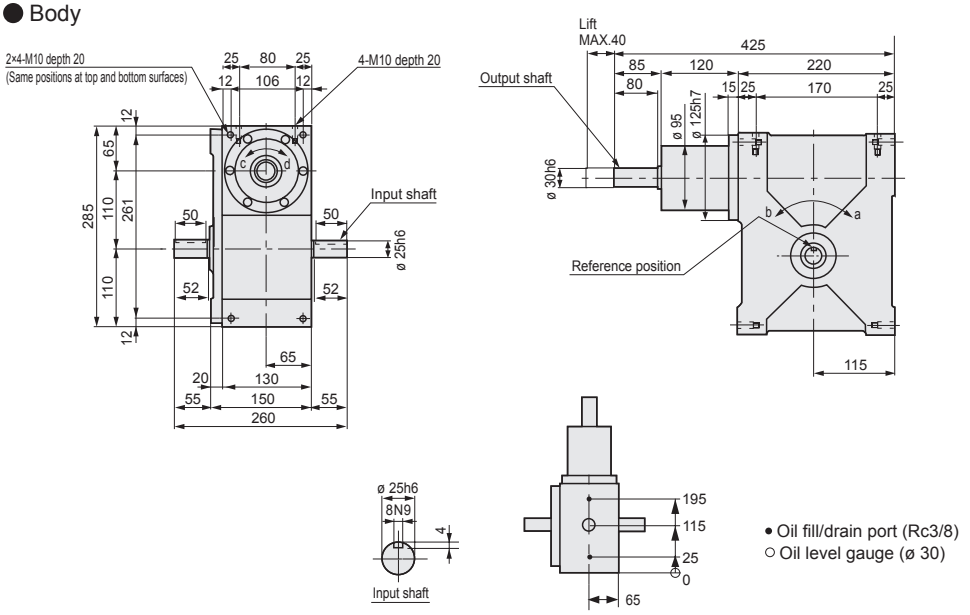
PPIX/PPOX080 Cam curve/MS

Lift *Lo* (mm)	Index angle: *θh* (°)	Rated dynamic payload *Mm* (kg) Input shaft rotational speed *N* (rpm) 20	30	40	50	60	80	100	120
5	19	11.1	8.4	6.3	4.7	3.5	1.7	0.7	-
	30	12.2	10.0	8.3	7.0	5.8	3.9	2.6	1.6
	40	12.6	10.6	9.1	7.9	6.9	5.2	3.9	2.8
10	26	10.6	7.9	5.9	4.3	3.1	1.5	0.5	-
	30	11.1	8.6	6.7	5.1	3.9	2.1	1.0	0.3
	40	11.9	9.7	8.0	6.6	5.4	3.6	2.3	1.3
15	32	10.2	7.6	5.7	4.2	3.0	1.4	0.5	-
	40	11.1	8.8	6.9	5.5	4.2	2.5	1.3	0.5
	50	11.8	9.6	7.9	6.6	5.4	3.6	2.3	1.4
20	38	10.0	7.5	5.6	4.2	3.0	1.4	0.5	-
	45	10.8	8.4	6.6	5.2	4.0	2.3	1.1	0.4
	55	11.5	9.3	7.6	6.2	5.1	3.3	2.0	1.1
25	42	9.6	7.2	5.4	3.9	2.8	1.3	0.4	-
	50	10.5	8.2	6.4	5.0	3.8	2.1	1.1	0.3
	60	11.2	9.0	7.3	6.0	4.8	3.1	1.9	1.0
30	46	9.4	7.0	5.2	3.8	2.7	1.2	0.3	-
	50	9.8	7.5	5.7	4.3	3.2	1.6	0.6	-
	60	10.6	8.4	6.8	5.4	4.2	2.5	1.4	0.6

Dimensions

CAD

Body



Characteristics

Descriptions		Characteristics	
		Output shaft	Input shaft
Allowable thrust force	N	*	3200
Allowable radial force	N	400	3300
Allowable bending moment	N·m	60	-
Torsion rigidity (K)	N·m/rad	20000	-
Moment of inertia	kg·m^2	3.59 × 10^{-3}	3.42 × 10^{-2}

Descriptions		Characteristics
Internal frictional torque (Tin)	N·m	20
Output shaft inner weight (mo)	kg	2.9
Product weight	kg	50
Oil level	ℓ	2.0
Paint color		Silver

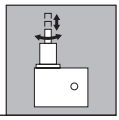
* Allowable output shaft thrust force is defined in the following formula.
Output shaft allowable thrust force = (allowable payload - max. payload) × 9.81 (N)

Accuracy

Descriptions		Swing direction	
		Index	Oscillator
Indexing accuracy	" (sec.)	±120	±120
Repeatability	" (sec.)	30	30
Dwell accuracy	" (sec.)	60	60

Descriptions		Lift direction
Stroke accuracy	mm	*
Repeatability	mm	±0.05

* Lift value 30 or less: ±0.2
more than 30 and 40 or less: ±0.3



Output torque table

Index P&P

PPIX110 Cam curve/MS

Index number *n* (°)	Index angle: *θh* (°)	Static rated output torque (N·m)	Dynamic rated output torque *Tr* (N·m) Input shaft rotational speed *N* (rpm) 20	30	40	50	60	80	100	120
2	120 150	129.0 140.0	54.8 98.0	52.8 96.0	51.3 93.5	50.2 91.6	46.5 90.0	41.2 85.9	37.1 78.4	33.9 72.6
3	90 120 150	129.0 140.0 140.0	58.3 107.0 116.0	56.1 104.0 115.0	54.6 102.0 112.0	53.3 99.4 110.0	49.4 97.7 108.0	43.6 93.3 104.0	39.3 85.2 94.7	35.7 78.8 87.9
4	60 75 90	67.4 67.4 91.5	34.9 40.3 59.4	33.5 38.7 57.3	32.4 37.6 55.7	31.5 36.7 54.5	29.0 33.9 50.6	25.0 29.8 44.8	21.7 26.5 40.6	18.8 23.8 37.1
6	45 60 75	140.0 140.0 140.0	88.7 105.0 116.0	85.3 101.0 112.0	82.9 98.3 109.0	81.0 96.1 107.0	79.3 94.4 105.0	74.9 89.9 100.0	67.3 81.6 91.2	60.9 75.0 84.3
8	35 45 60	67.4 91.5 129.0	37.3 57.6 74.7	35.8 55.4 71.9	34.6 53.8 70.0	33.5 52.5 68.5	30.7 48.6 63.6	26.1 42.6 56.4	22.2 38.0 51.1	18.5 34.1 46.9

Output torque table

Oscillator P&P

PPOX110 Cam curve/MS

Oscillating angle *ψ* (°)	Index angle: *θh* (°)	Static rated output torque (N·m)	Dynamic rated output torque *Tr* (N·m) Input shaft rotational speed *N* (rpm) 20	30	40	50	60	80	100	120
30	30 45 60	129 140 140	64.6 120.0 129.0	58.7 116.0 126.0	52.2 111.0 120.0	47.4 101.0 110.0	43.7 94.3 103.0	37.8 83.8 91.4	33.1 76.1 83.4	28.9 70.0 77.2
45	35 45 60	129 140 140	57.0 103.0 117.0	51.8 99.6 113.0	46.0 95.3 108.0	41.7 87.1 99.2	38.3 80.8 92.2	32.9 71.4 82.0	28.4 64.4 74.5	24.3 58.7 68.7
60	45 60 75	140 140 140	88.7 105.0 116.0	85.3 101.0 112.0	81.5 96.6 107.0	74.4 88.4 98.0	68.9 82.1 91.1	60.5 72.8 81.1	54.0 65.9 73.8	48.6 60.4 68.1
90	60 75 90	129 140 140	53.1 96.6 107.0	48.3 93.0 103.0	42.9 89.0 98.5	39.1 81.4 90.2	36.0 75.6 83.8	31.3 67.0 74.5	27.5 60.6 67.8	24.1 55.5 62.5
120	90 120 150	129 140 140	58.3 107.0 116.0	53.1 104.0 115.0	47.3 99.9 111.0	43.2 91.4 101.0	40.0 85.0 94.3	35.2 75.7 84.1	31.6 69.0 76.8	28.6 63.8 71.2
180	120 150	129 140	54.8 98.0	50.0 96.0	44.5 92.0	40.7 84.2	37.7 78.3	33.3 69.7	29.9 63.5	27.1 58.7

Payload table

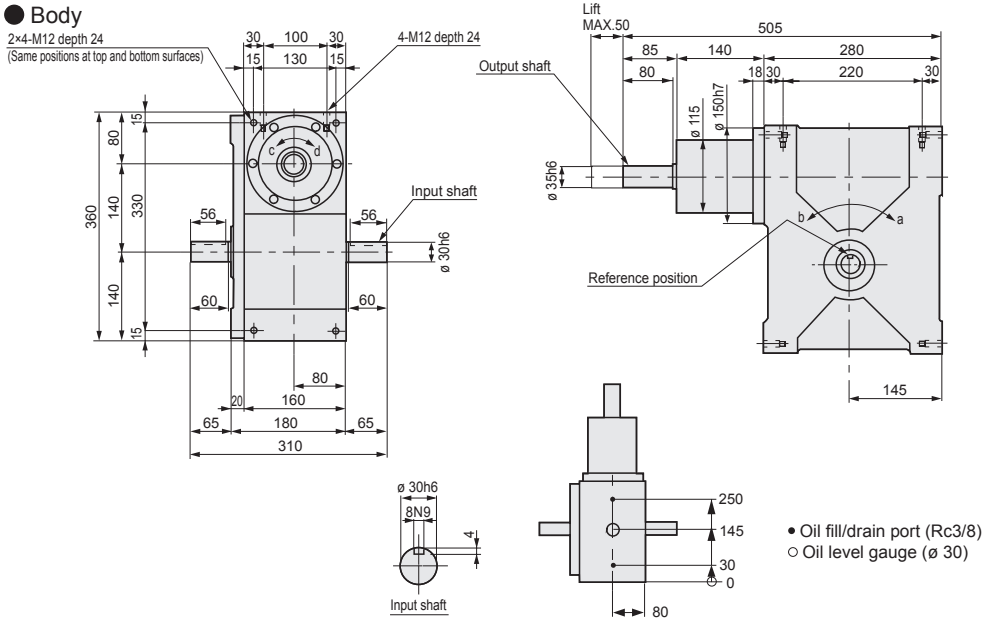
PPIX/PPOX110 Cam curve/MS

Lift *Lo* (mm)	Index angle: *θh* (°)	Rated dynamic payload *Mm* (kg) Input shaft rotational speed *N* (rpm) 20	30	40	50	60	80	100	120
10	25 30 40	22.4 23.7 25.1	16.7 18.4 20.5	12.4 14.4 17.0	9.1 11.2 14.1	6.6 8.6 11.6	3.2 4.9 7.8	1.3 2.6 5.1	- 1.1 3.2
20	35 45 55	21.3 23.3 24.5	15.8 18.3 19.9	11.6 14.5 16.4	8.5 11.4 13.5	6.1 8.9 11.1	2.9 5.3 7.3	1.0 2.9 4.7	- 1.4 2.8
30	41 50 60	19.8 21.8 23.3	14.5 16.8 18.5	10.5 13.0 14.9	7.5 9.9 12.0	5.2 7.5 9.6	2.3 4.1 5.9	0.6 2.0 3.5	- 0.6 1.8
40	47 50 60	18.9 19.6 21.5	13.7 14.5 16.7	9.9 10.7 13.0	7.0 7.7 10.0	4.8 5.5 7.6	2.0 2.5 4.3	0.4 0.8 2.1	- - 0.8

Dimensions

CAD

Body



Characteristics

Descriptions		Characteristics	
		Output shaft	Input shaft
Allowable thrust force	N	*	4800
Allowable radial force	N	530	4900
Allowable bending moment	N·m	120	-
Torsion rigidity (K)	N·m/rad	30000	-
Moment of inertia	kg·m^2	7.3 × 10^{-3}	0.11

Descriptions		Characteristics
Internal frictional torque (Tin)	N·m	35
Output shaft inner weight (mo)	kg	5.6
Product weight	kg	90
Oil level	ℓ	4.0
Paint color		Silver

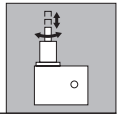
* Allowable output shaft thrust force is defined in the following formula.
Output shaft allowable thrust force = (allowable payload - max. payload) × 9.81 (N)

Accuracy

Descriptions		Swing direction	
		Index	Oscillator
Indexing accuracy	" (sec.)	±120	±120
Repeatability	" (sec.)	30	30
Dwell accuracy	" (sec.)	60	60

Descriptions		Lift direction
Stroke accuracy	mm	*
Repeatability	mm	±0.05

* Lift value 30 or less: ±0.2
more than 30 and 50 or less: ±0.3



Output torque table

Index P&P

PPIX140 Cam curve/MS

Index number *n* (°)	Index angle: *θh* (°)	Static rated output torque (N·m)	Dynamic rated output torque *Tr* (N·m) Input shaft rotational speed *N* (rpm) 20	30	40	50	60	80
2	120	169	109	105	102	100	98	93
	150	272	197	193	188	184	178	159
3	90	248	151	145	141	138	128	114
	120	272	213	208	203	198	193	172
	150	272	229	229	223	218	212	189
4	60	148	66	64	62	60	55	47
	75	148	76	73	71	69	64	56
	90	169	133	128	125	122	120	114
6	45	272	178	172	167	163	158	139
	60	272	209	201	196	192	186	165
	75	272	229	222	216	211	205	183
8	35	148	70	68	65	63	58	49
	45	169	129	124	120	117	115	109
	60	248	190	183	178	174	162	144

Output torque table

Oscillator P&P

PPOX140 Cam curve/MS

Oscillating angle *ψ* (°)	Index angle: *θh* (°)	Static rated output torque (N·m)	Dynamic rated output torque *Tr* (N·m) Input shaft rotational speed *N* (rpm) 20	30	40	50	60	80
30	30	248	165	151	134	122	113	98
	45	272	237	226	202	185	172	152
	60	272	253	244	218	200	186	166
45	35	248	147	134	119	108	100	87
	45	272	206	197	175	160	149	131
	60	272	233	222	198	181	168	150
60	45	272	178	170	151	138	128	112
	60	272	209	199	178	163	151	134
	75	272	229	219	196	179	167	148
90	60	248	138	126	112	102	94	82
	75	272	194	184	165	150	140	124
	90	272	213	203	181	166	154	137
120	90	248	151	138	123	112	104	92
	120	272	213	206	184	168	156	139
	150	272	229	226	202	185	172	154
180	120	169	109	105	100	92	85	75
	150	272	197	190	170	156	145	129

Payload table

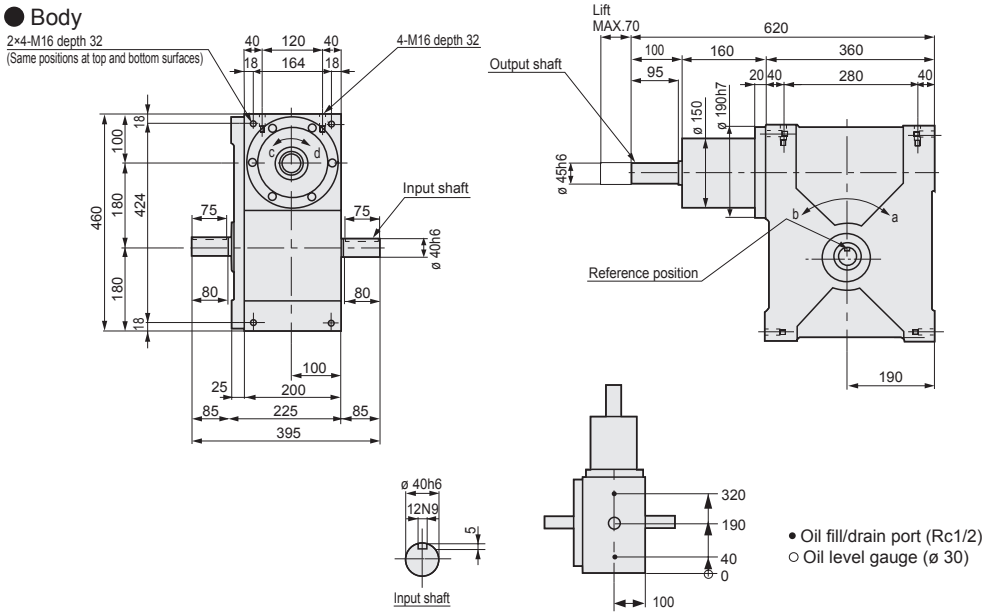
PPIX/PPOX140 Cam curve/MS

Lift *Lo* (mm)	Index angle: *θh* (°)	Rated dynamic payload *Mm* (kg) Input shaft rotational speed *N* (rpm) 20	30	40	50	60	80
10	20	29.8	20.3	13.5	8.6	5.2	1.0
	25	32.6	24.0	17.5	12.5	8.7	3.7
	35	35.5	28.2	22.5	17.9	14.1	8.4
20	30	29.3	20.4	13.8	9.1	5.7	1.4
	35	31.5	23.1	16.7	11.9	8.2	3.3
	45	34.2	26.6	20.8	16.1	12.3	6.8
30	35	27.3	18.5	12.2	7.8	4.6	0.6
	45	31.2	23.1	17.0	12.3	8.6	3.7
	55	33.5	26.0	20.3	15.7	12.0	6.6
40	40	26.0	17.5	11.4	7.1	4.1	0.3
	50	29.8	21.8	15.8	11.2	7.7	3.0
	60	32.2	24.7	19.0	14.4	10.8	5.5
50	45	25.1	16.9	11.1	6.8	3.9	0.2
	50	27.1	19.1	13.1	8.7	5.5	1.4
	60	30.1	22.4	16.6	12.1	8.6	3.7

Dimensions

CAD

Body



Characteristics

Descriptions		Characteristics	
		Output shaft	Input shaft
Allowable thrust force	N	*	7000
Allowable radial force	N	700	6200
Allowable bending moment	N·m	170	-
Torsion rigidity (K)	N·m/rad	70000	-
Moment of inertia	kg·m^2	2.3 × 10^{-2}	0.39

Descriptions		Characteristics
Internal frictional torque (Tin)	N·m	50
Output shaft inner weight (mo)	kg	11
Product weight	kg	185
Oil level	ℓ	8.0
Paint color		Silver

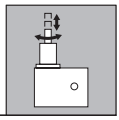
* Allowable output shaft thrust force is defined in the following formula.
Output shaft allowable thrust force = (allowable payload - max. payload) × 9.81 (N)

Accuracy

Descriptions		Swing direction	
		Index	Oscillator
Indexing accuracy	" (sec.)	±120	±120
Repeatability	" (sec.)	30	30
Dwell accuracy	" (sec.)	60	60

Descriptions		Lift direction
Stroke accuracy	mm	*
Repeatability	mm	±0.05

* Lift value 30 or less: ±0.2
more than 30 and 70 or less: ±0.3



Output torque table

Index P&P

PPIX180 Cam curve/MS

Index number *n* (°)	Index angle: *θh* (°)	Static rated output torque (N·m)	Dynamic rated output torque *Tr* (N·m)				
			Input shaft rotational speed *N* (rpm)				
			20	30	40	50	60
2	120 150	568 568	271 306	261 300	254 292	248 285	230 265
3	90 120 150	568 710 710	287 432 465	276 422 464	269 411 451	262 402 442	243 374 411
4	60 75 90	216 318 345	135 203 272	129 195 262	125 190 255	121 185 249	117 171 241
6	45 60 75	568 710 710	278 424 464	267 409 449	259 397 437	251 388 428	232 360 397
8	35 45 60	318 345 568	189 263 361	181 253 347	174 246 338	168 239 330	153 231 306

Output torque table

Oscillator P&P

PPOX180 Cam curve/MS

Oscillating angle *ψ* (°)	Index angle: *θh* (°)	Static rated output torque (N·m)	Dynamic rated output torque *Tr* (N·m)				
			Input shaft rotational speed *N* (rpm)				
			20	30	40	50	60
30	30 45 60	568 710 710	315 480 510	286 438 472	254 390 422	230 357 386	211 331 359
45	35 45 60	568 710 710	280 419 471	254 381 429	225 340 383	204 310 350	187 286 325
60	45 60 75	568 710 710	278 424 464	253 387 425	224 345 379	203 315 347	187 292 322
90	60 75 90	568 568 710	263 302 432	239 275 394	212 245 352	193 223 322	177 206 299
120	90 120 150	568 710 710	287 432 465	262 400 439	233 357 392	213 326 359	197 303 334
180	120 150	568 568	271 306	247 284	220 253	201 232	186 215

Payload table

PPIX/PPOX180 Cam curve/MS

Lift *Lo* (mm)	Index angle: *θh* (°)	Rated dynamic payload *Mm* (kg)				
		Input shaft rotational speed *N* (rpm)				
		20	30	40	50	60
10	18 25 35	41.5 48.0 52.1	26.1 34.6 40.8	15.5 24.5 32.1	8.3 16.8 25.0	3.3 11.0 19.2
20	26 30 40	40.4 43.8 49.0	25.6 29.7 36.6	15.3 19.4 27.1	8.2 12.0 19.6	3.4 6.6 13.7
30	31 35 45	38.3 41.5 46.8	23.8 27.4 34.1	13.8 17.4 24.4	7.0 10.2 17.0	2.4 5.1 11.2
40	36 40 50	37.1 40.1 45.2	23.0 26.3 32.5	13.3 16.4 22.9	6.7 9.4 15.5	2.1 4.5 9.9
50	40 50 60	35.7 41.8 45.8	21.9 28.8 33.6	12.5 19.2 24.3	6.1 12.0 17.1	1.7 6.8 11.4
60	44 50 60	34.7 38.5 43.1	21.2 25.3 30.6	12.0 15.9 21.3	5.7 9.1 14.2	1.4 4.3 8.8
70	48 50 60	33.9 35.2 40.4	20.8 22.2 27.8	11.8 13.0 18.5	5.6 6.7 11.6	1.4 2.2 6.5