PAC

The PAC Standard Series round mounting flange, caged standard class planetary gears, in an in-line housing through sizes to 120 mm. Offers an economic alternative of torque capacity, quiet operation with backlash as low as <6 arc-min. For general speed reduce applications.

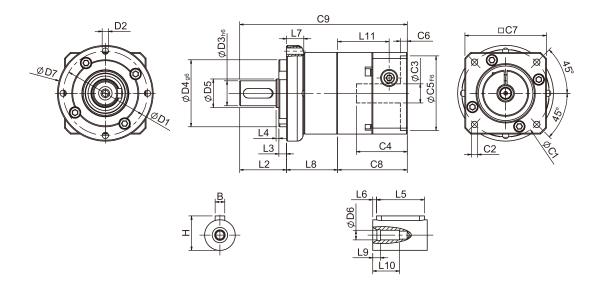


Frame Size (mm)	50, 70, 90, 120
Ratio	3:1-100:1
Nominal Input Speed (rpm)	2,500 - 4,000
Max Input Speed (rpm)	5,000 - 8,000
Backlash (arc-min)	1 Stage : 6 - 9 2 Stages : 8 - 12
Noise Level (dBA / 1m)	61 - 67

Features

- ► In-line Configuration.
- Output shaft, 12 mm through 32 mm diameter.
- ► Torque Capacity Range: 8 Nm through 260 Nm.
- ► Caged Planet Carrier: with standard planet gear set.
- ► High performance, efficiencies and low acoustics.
- ▶ Wide Range of Ratios: 6 single stage, 12 two stage ratios.
- ▶ Output Bearings deliver radial load capacity as high as 4200 N, and axial capacities up to 2600 N.
- ➤ Square Servo and Step Motor input: accommodates 40 mm through 130 mm, with optional sizes available.

PAC Single Stage Dimensions



Specifications

Unit:mm

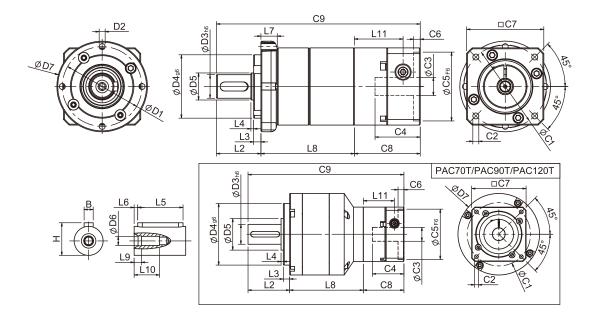
Dimensions	PAC50	PAC70	PAC90	PAC120
D1	44	62	80	108
D2	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P
D3h6	12	16	22	32
D4g6	35	52	68	90
D5	15	20	35	45
D6	M4x0.7P	M5x0.8P	M8x1.25P	M12x1.75P
D7	50	70	90	120
L2	24.5	36	46	60
L3	4	6	7	7
L4	1.5	1.5	2.5	2
L5	15	25	32	40
L6	2	2	3	5
L7	8.8	13.3	14	15
L8	26.5	37.3	43.8	65.3
L9	4	4	4.5	6
L10	12	16.5	20.5	30
L11	26.9	34.3	41.2	51.5
C1 ²	46	70	90	145
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P
C3 ²	<u>≤</u> 8/ <u>≤</u> 11	≦14/≦19	≦19/≦24/≦28	<u>≤</u> 24/ <u>≤</u> 32/ <u>≤</u> 38
C4 ²	26.5	33.5	41	51.5
C5 ² F6	30	50	70	40
C6 ²	4	4	6	6
C7 ²	42.6	60	90	130
C8 ²	36.4	44.8	55.8	68
C9 ²	87.4	118.1	145.6	193.3
В	4	5	6	10
Н	13.5	18	24.5	35

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]bigstar$ Specification subject to change without notice.



PAC Double Stage Dimensions-1



Dimensions	PAC50	PAC70	PAC70T	PAC90	PAC90T	PAC120T
D1	44	6	2	80	108	
D2	M4x0.7P	M5x	0.8P	M6x2	1.0P	M8x1.25P
D3 _{h6}	12	1	6	22	2	32
D4 _{g6}	35	5	2	68	3	90
D5	15	2	0	3!	5	45
D6	M4x0.7P	M5x	0.8P	M8x1	.25P	M12x1.75P
D7	50	7	0	90)	120
L2	24.5	3	6	46	5	60
L3	4	(5	7	,	7
L4	1.5	1	.5	2.	5	2
L5	15	2		32		40
L6	2		2	3		5
L7	8.8	13	3.3	14		15
L8	51.4	68	63.6	84.8	74.3	103.4
L9	4		1	4.5		6
L10	14	16	5.5	20.5		30
L11	26.9	34.3	26.6	41.5	34.3	41.5
C1 ²	46	70	46	90	70	90
C2 ²	M4x0.7P	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P	M8x1.25P
C3 ²	≦8/≦11	≦14/≦19	≦8/≦11	≦19/≦24/≦28	≦14/≦19	<u>≤</u> 19/ <u>≤</u> 24/ <u>≤</u> 28
C4 ²	26.5	33.5	26.5	41	33.5	41
C5 ² F6	30	50	30	70	50	70
C6 ²	4	4	4	6	4	6
C7 ²	42.6	60	42.6	90	60	90
C8 ²	36.4	44.8	36.4	55.8	44.8	55.8
C9 ²	112.3	148.8	136	186.6	165.1	219.2
В	4		5	6	10	
Н	13.5	1	8	24	.5	35



[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]star$ Specification subject to change without notice.

PAC Specifications

Spe	cifications		Stage	Ratio	PAC-50	PAC-70	PAC-90	PAC-120
			9 -	3	9	28	85	210
				4	10	32	80	240
				5	11	35	95	260
			1	7	10	28	85	220
				9	8	23	75	210
				10	8	21	65	190
			Ctono		DAC FO	PAC-70/	PAC-90/	
			Stage	Ratio	PAC-50	70T	90T	PAC-120T
				15	11	34	90	230
				20	10	32	80	240
	_	N•m		25	11	35	95	260
Nominal Output T	orque T _{2N}			30	-	-	-	260
				35	11	35	95	260
			2	40	-	- 35	- OF	260
			_	45	11	35	95	260
				49 50	10 -	- 35	<u>-</u> 95	260
				63	10		93	200
				70	-	28	- 85	220
				100	8	21	65	190
Emergency Stop T	orque T _{anor}	N•m		1	(3.0 t imes	s of Nominal Out T _{2B} =60% of Eme	tput Torque)	
Nominal Input S	2,101	rpm	1,2	3-100	4000	4000	3000	2500
Max. Input Spe		rpm	1,2	3-100	8000	6000	6000	5000
		arcmin	1,2	3-100	<u>≦</u> 9	≦8	 ≦7	
Standard Backla		N•m	2	15-100	≦12	≦ 10	<u>≦</u> 9	≦8
Torsional Rig		/arcmin	1,2	3-100	1.5	4.0	8.5	17
Max. Radial Lo		N	1,2	3-100	760	1250	2030	4200
Max. Axial Loa Operating Te	200	N °C	1,2	3-100 3-100	410	700	1200 +90 ℃	2600
Service Lif		hr		3-100	20	,000 (10,000 Cor	tinuous operat	ion)
			1	3-100	20,			1011)
Efficiency	<u>'</u>	%	2	15-100		≥95 ≥90	0%	
Weight		kg	1 2	3-10 15-100	0.6 0.8	1.3 1.8(1.6)	3.2 4.8(3.7)	7.5 9.2
Mounting Po	sition	-	1,2	3-100		Any Di	irection	
Noise Leve	2	dBA/1m	1,2	3-100	61	63	66	67
Protection C	lass	_	1,2	3-100			65	
Lubricatio	n	_	1,2	3-100		Synthetic	Lubricant	
				Inertia (J1	.)			
Stage		ntio		unit	PAC-50(ψ8)	ΡΑC-70(ψ14)	<u> </u>	PAC-120(ψ24)
		3			0.04	0.23	0.77	2.30
1		<u>4</u> 5			0.03	0.21	0.67	1.92
					0.03	0.21	0.61	1.71
		7		2	0.03	0.21	0.60	1.65
		/10	^k	⟨g·cm²	0.03	0.21 PAC-70(ψ14)/	0.60 PAC-90(ψ19)/	1.63 PAC-120T
Stage		atio			PAC-50(ψ8)	70T(ψ8)	90Τ(ψ14)	(ψ19)
2		20/25			0.03	0.21(0.03)	0.61(0.21)	0.61 0.60
		35/49				0.21(0.03) 0.21(0.03)	0.60(0.21) 0.60(0.21)	0.60
40/45/50		(D3//U/10	U		0.03	0.21(0.03)	0.00(0.21)	0.00

^{* 1.} Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.



 $[\]star$ 2. Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio =

^{*}The above figures/specifications are subject to change without prior notice.

PACR

The PACR Primary Series flange mounting planetary speed reducer is equipped with caged standard class planetary gears in a right angle housing through sizes to 120 mm. It offers a economic alternative of torque capacity, quiet operation with backlash as low as <11 arc-min. For general speed reduce applications.

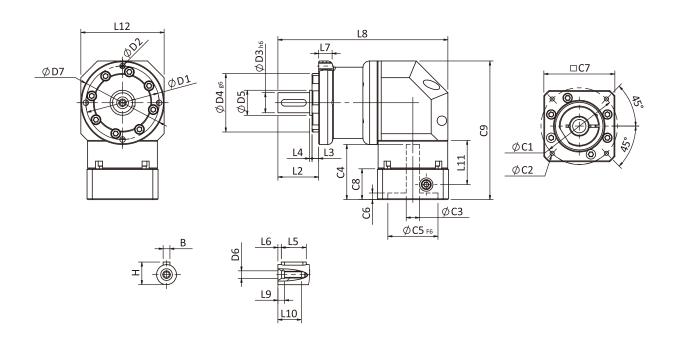


Frame Size (mm)	50, 70, 90, 120
Ratio	3:1-300:1
Nominal Input Speed (rpm)	2,500 - 4,500
Max Input Speed (rpm)	5,000 - 7,500
Backlash (arc-min)	1 Stage: 11 - 18 2 Stages: 13 - 20
Noise Level (dBA / 1m)	66 - 73

Features

- ► Right Angle Configuration.
- ▶ Output shaft, 12 mm through 32 mm diameter.
- ► Torque Capacity Range: 8 Nm through 240 Nm.
- ► Caged Planet Carrier: with standard planet gear set.
- ► High performance, efficiencies and low acoustics.
- ▶ Wide Range of Ratios: 10 single stage ratios, 14 two stage ratios.
- ▶ Output Bearings deliver radial load capacity as high as 4200 N, and axial capacities up to 2600 N.
- ► Square Servo and Step Motor input: accommodates 40 mm through 130 mm, with optional sizes available.

PACR Single Stage Dimensions



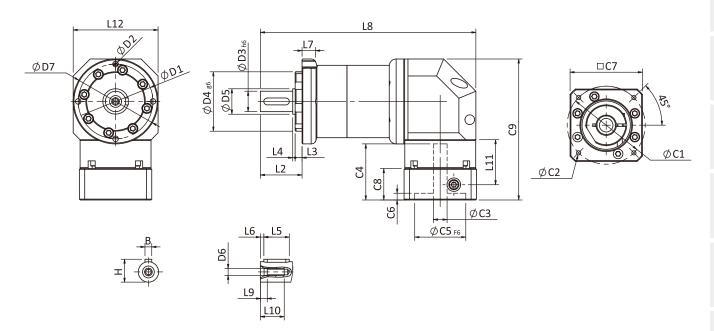
Dimensions	PACR50	PACR70	PACR90	PACR120
D1	44	62	80	-
D2	M4x0.7P	M5x0.8P	M6x1.0P	-
D3h6	12	16	22	-
D4 ₉₆	35	52	68	-
D5	15	20	35	-
D6	M4x0.7P	M5x0.8P	M8x1.25P	-
D7	50	70	90	-
L2	24.5	36	46	-
L3	4	6	7	-
L4	1.5	1.5	2.5	-
L5	15	25	32	-
L6	2	2	3	-
L7	8.8	13.3	14	-
L8	102	143.6	194.5	-
L9	4	4	4.5	-
L10	14	16.5	20.5	-
L11	26.5	36	40.7	-
L12	50	70	98	-
C1 ²	46	70	90	-
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	-
C3 ²	≦8/≦11	≦14/≦19	<u>≤</u> 19/ <u>≤</u> 24	-
C4 ²	33	44	57	-
C5 ² F6	30	50	70	-
C6 ²	4	4	6	-
C72	42.6	60	90	-
C8 ²	18.5	20	26	-
C9 ²	83	111.4	149.2	-
В	4	5	6	-
Н	13.5	18	24.5	-

 $[\]star$ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

[★] Specification subject to change without notice.



PACR Double Stage Dimensions-1

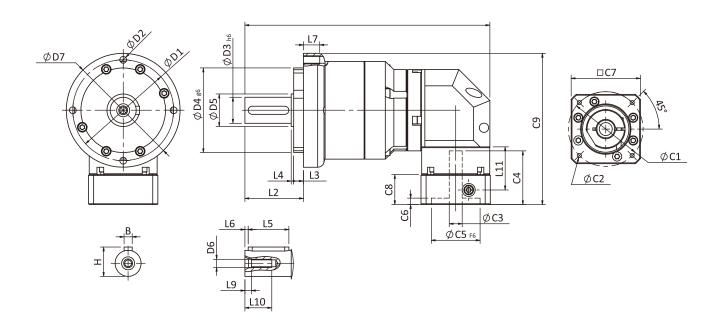


	I	I	I	I
Dimensions	PACR50	PACR70	PACR90	PACR120
D1	44	62	80	-
D2	M4x0.7P	M5x0.8P	M6x1.0P	-
D3h6	12	16	22	-
D4 _{g6}	35	52	68	-
D5	15	20	35	-
D6	M4x0.7P	M5x0.8P	M8x1.25P	-
D7	50	70	90	-
L2	24.5	36	46	-
L3	4	6	7	-
L4	1.5	1.5	2.5	-
L5	15	25	32	-
L6	2	2	3	-
L7	8.8	13.3	14	-
L8	126.9	174.3	235.5	-
L9	4	4	4.5	-
L10	14	16.5	20.5	-
L11	26.5	36	40.7	-
L12	50	70	98	-
C1 ²	46	70	90	-
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	-
C3 ²	≦8/≦11	<u>≤</u> 14/ <u>≤</u> 19	≦19/≦24	-
C4 ²	33	44	57	-
C5 ² F6	30	50	70	-
C6 ²	4	4	6	-
C7 ²	42.6	60	90	-
C8 ²	18.5	20	26	-
C9 ²	83	111.4	149.2	-
В	4	5	6	-
Н	13.5	18	24.5	-

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]star$ Specification subject to change without notice.

PACR Double Stage Dimensions-2



Specifications

Unit:mm

Dimensions	PACR70T	PACR90T	PACR120T
D1	62	80	108
D2	M5x0.8P	M6x1.0P	M8x1.25P
D3h6	16	22	32
D4 ₉₆	52	68	90
D5	20	35	45
D6	M5x0.8P	M8x1.25P	M12x1.75P
D7	70	90	120
L2	36	46	60
L3	6	7	7
L4	1.5	2.5	2
L5	25	32	40
L6	2	3	5
L7	13.3	14	15
L8	150.6	190.6	268.1
L9	4	4.5	6
L10	16.5	20.5	30
L11	26.5	36	40.7
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	≦8/≦11	≦14/≦19	<u>≤</u> 19/ <u>≤</u> 24
C4 ²	33	44	57
C5 ² _{F6}	30	50	70
C6 ²	4	4	6
C7 ²	42.6	60	90
C8 ²	18.5	20	26
C9 ²	93	121.4	160.2
В	5	6	10
Н	18	24.5	35

 $[\]star$ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]bigstar$ Specification subject to change without notice.



PACR Specifications

Sp	oecifications		Stage	Ratio	PACR50	PACR70	PACR90	PACR120
				3	9	28	85	135
				4	10	32	80	180
				5	11	35	95	215
				7	10	28	85	220
			1	8	10	32	80	210
				9	9	25	75	210
				10	11	35	95	210
				12	10	32	80	-
				14	10	28	85 95	220
Nominal Out	put Torque T _{2N}	N•m	Stage	15 Ratio	PACR50	95 PACR70/ PACR70T	PACR90/ PACR90T	PACR120T
				20	10	32	80	240
				25	11	35	95	240
				30	11	34	90	230
				35	11	35	95	240
				40	10	32	80	240
				50	11	35	95	240
			2	60	11	35	95	240
			2					
				70	11	35	95	240
				80	11	35	95	240
				100	8	35	95	240
				120	11	35	95	240
				140	-	28	85	220
				200	8	21	65	190
				300	8	21	65	190
Emergency St	op Torque T _{2NOT}	N•m (2.5 times of Nominal Output Torque) (*Max. Output Torque T ₂₈ =60% of Emergency Stop Torque)						
Nominal Inp	out Speed n _{in}	rpm	1,2	3-300	4500	4000	3000	2500
Max. Input	Speed n _{1max}	rpm	1,2	3-300	7500	7000	6000	5000
Standard I	Backlash P2	arcmin	1	3-15	≦ 18	≦ 15	≦13	≦ 11
			2	20-300	≤ 20	≦ 17	≦15	≦13
Torsiona	al Rigidity	N•m /arcmin	1,2	3-300	1.5	4.0	8.5	17
Max. Radi	al Load F _{2rB} ¹	N	1,2	3-300	760	1250	2030	4200
	I Load F _{2aB} ¹	N	1,2	3-300	410	700	1200	2600
Operati	ng Temp.	℃		3-300		-10°C ~	, +90°C	
Servi	ce Life	hr		3-300		20,000 (10,000 Con	tinuous Operation))
			1	3-15	İ	≥ 9.	•	
Effic	riency	%	2	20-300		≥ 9		
			1	3-15	1.1	2.6	6.5	13.4
We	eight	kg			1.3	3.2/3.0		15.1
Mountin	g Position		2	20-300	1.3	3.2/3.0 Any Di	8.7/7.1	13.1
		- ID 4 /1	1,2	3-100				72
	Level 2	dBA/1m	1,2	3-100	66	68	70	73
	ion Class	-	1,2	3-100		IP		
Lubri	cation	-	1,2	3-100		Synthetic	Lubricant	
					Inertia (J1)			
Stage	Ratio)		unit	PACR50(φ8)	PACR70(φ14)	PACR90(φ19)	PACR120(φ24)
1 3, 4, 5 Other R		5, 7			0.07	0.40	2.0	2.7
		atios			0.05	0.30	1.5	2.2
Stage	Stage Ratio			kg•cm²	PACR50(φ8)	PACR70(φ14)/ PACR70T(φ8)	PACR90(φ19)/ PACR90T(φ14)	PACR120T(φ19)
	20, 25,	, 35			0.07	0.40/0.07	2.0/0.40	2.0
2	Other R	atios			0.05	0.30/0.05	1.5/0.30	1.5
. 1 A . 12 . 1								L

^{* 1.} Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio =

^{*}The above figures/specifications are subject to change without prior notice.

PAE

The PAE Primary Series square mounting flange, caged standard class planetary gears, in an in-line housing through sizes to 115 mm. Offers a economic alternative of torque capacity, quiet operation with backlash as low as <6 arc-min. For general speed reduce applications.

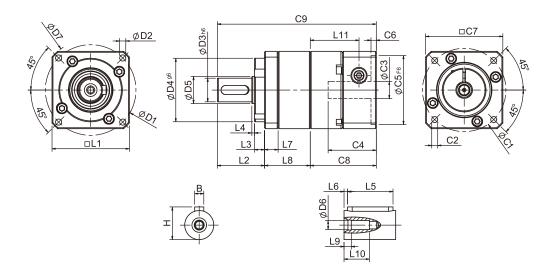


Frame Size (mm)	42, 60, 90, 115
Ratio	3:1-100:1
Nominal Input Speed (rpm)	2,500 - 4,000
Max Input Speed (rpm)	5,000 - 8,000
Backlash (arc-min)	1 Stage : 6 - 9 2 Stages : 8 - 12
Noise Level (dBA / 1m)	61 - 67

Features

- ► In-line Configuration.
- ▶ Output shaft, 13 mm through 32 mm diameter.
- ► Torque Capacity Range: 8 Nm through 260 Nm.
- ► Caged Planet Carrier: with standard planet gear set.
- ► High performance, efficiencies and low acoustics.
- ► Wide Range of Ratios: 6 single stage, 12 two stage ratios.
- ▶ Output Bearings deliver radial load capacity as high as 4200 N, and axial capacities up to 2600 N.
- ► Square Servo and Step Motor input: accommodates 40 mm through 130 mm, with optional sizes available.

PAE Single Stage Dimensions



Specifications

Unit:mm

Dimensions	PAE42	PAE60	PAE90	PAE115
D1	50	70	100	130
D2	3.4	5.5	6.5	9
D3 h6	13	16	22	32
D4 _{g6}	35	50	80	110
D5	15	20	35	45
D6	M4x0.7P	M5x0.8P	M8x1.25P	M12x1.75P
D7	56	80	118	148
L1	42.6(44)	60	90	115
L2	26	37	48	65
L3	5.5	7	10	12
L4	1.5	1.5	1.5	2
L5	15	25	32	40
L6	2	2	3	5
L7	7.3	10	12	16
L8	25	36.3	41.8	60.3
L9	4	4	4.5	6
L10	14	16.5	20.5	30
L11	26.9	34.3	41.5	51.5
C1 ²	46	70	90	145
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P
C3 ²	≦8/≦11	<u>≤</u> 14/ <u>≤</u> 19	<u>≤</u> 19/ <u>≤</u> 24/ <u>≤</u> 28	<u>≤</u> 24/ <u>≤</u> 32/ <u>≤</u> 38
C4 ²	26.5	33.5	41	51.5
C5 ² F6	30	50	70	110
C6 ²	4	4	6	6
C7 ²	42.6	60	90	130
C8 ²	36.4	44.8	55.8	68
C9 ²	87.4	118.1	145.6	193.3
В	4	5	6	10
Н	15	18	24.5	35

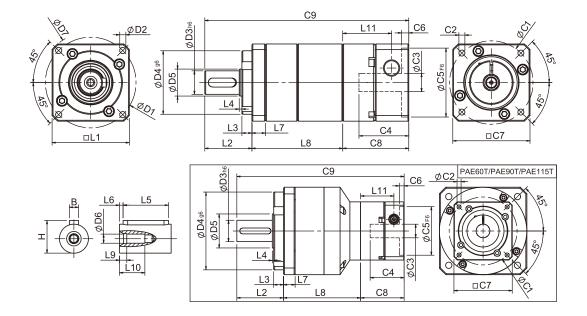
 $[\]star$ L1=44 when gear ratio is 10.

 $[\]bigstar$ Specification subject to change without notice.



 $[\]star$ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

PAE Double Stage Dimensions-1



Unit:mm **Specifications**

Dimensions	PAE42	PAE60	PAE60T	PAE90	PAE90T	PAE115T 130
D1	50	7			100	
D2	3.4	5.		6.		9
D3h6	13	1		2		32
D4 _{g6}	35	5	0	8	0	110
D5	15	2		3	5	45
D6	M4x0.7P	M5x	0.8P	M8x1	L.25P	M12x1.75P
D7	56	8	0	11	18	148
L1	42.6(44)	6	0	9	0	115
L2	26	3	7	4	8	65
L3	5.5	7	7	1	0	12
L4	1.5	1.	5	1.	.5	2
L5	15	2	5	32		40
L6	2	2	2	3		5
L7	7.3	1	0	12		16
L8	49.9	67	62.6	82.8	72.3	98.4
L9	4		1	4.5		6
L10	14	16	.5	20.5		30
L11	26.9	34.3	26.9	41.5	34.3	41.5
C12	46	70	46	90	70	90
C2 ²	M4x0.7P	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P	M6x1.0P
C3 ²	≦8/≦11	<u>≤</u> 14/ <u>≤</u> 19	<u>≤</u> 8/ <u>≤</u> 11	≦19/≦24/≦28	<i>≦</i> 14/ <i>≦</i> 19	≦19/≦24/≦28
C4 ²	26.5	33.5	26.5	41	33.5	41
C5 ² F6	30	50	30	70	50	70
C6 ²	4	4	4	6	4	6
C7 ²	42.6	60	42.6	90	60	90
C8 ²	36.4	44.8	36.4	55.8	44.8	55.8
C9 ²	112.3	148.8	136	186.6	165.1	219.2
В	5	5)	(10	
Н	15	1	8	24	l.5	35

 $[\]star$ L1=44 when gear ratio is 100.

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]star$ Specification subject to change without notice.

PAE Specifications

Spec	Specifications		Stage	Ratio	PAE42	PAE60	PAE90	PAE115
		I		3	9	28	85	210
				4	10	32	80	240
			1	5	11	35	95	260
			1	7	10	28	85	220
				9	8	23	75	210
				10	8	21	65	190
Nominal Output To	orque T _{2N}	N•m	Stage	Ratio	PAE42	PAE60/ PAE60T	PAE90/ PAE90T	PAE115T
				15	11	34	90	230
				20	10	32	80	240
				25	11	35	95	260
				30	-	-	-	260
				35	11	35	95	260
			2	40	-	-	-	260
				45	11	35	95	260
				49	10	-	-	-
				50	-	35	95	260
				63	10	-	-	-
				70	-	28	85	220
				100	8	21	65	190
Emergency Stop Tor	que T _{2NOT}	N•m		(*M	(3.0 times ax. Output Torque	of Nominal Outp e T _{2B} =60% of Em	ut Torque) ergency Stop Tor	que)
Nominal Input Sp	eed n _{in}	rpm	1,2	3-100	4000	4000	3000	2500
Max. Input Speed	Max. Input Speed n _{1max}		1,2	3-100	8000	6000	6000	5000
Standard Backla	sh P2	arcmin	1 2	3-10 15-100	≦9 ≦12	≦ 8 ≤ 10	≦ 7 ≦ 9	≦ 6 ≤ 8
Torsional Rigio	Torsional Rigidity		1,2	3-100	1.5	4.0	8.5	17
Max. Radial Load	d F _{2rB} ¹	/arcmin	1,2	3-100	760	1250	2030	4200
Max. Axial Load	F _{2aB} ¹	N	1,2	3-100	410	700	1200	2600
Operating Ter	mp.	°C	1,2	3-100	-10°C ~ +90°C			
Service Life		hr	1,2	3-100	20,000 (10,000 Continuous Operation)			n)
Efficiency		%	1 2	3-10 15-100	≥ 95% ≥ 90%			
		<u>.</u>	1	3-10	0.6	1.3	3.2	7.5
Weight		kg	2	15-100	0.8	1.8/1.6	4.8/3.7	9.2
Mounting Posi	tion	-	1,2	3-100		Any Dii	· · · · · · · · · · · · · · · · · · ·	
Noise Level		dBA/1m	1,2	3-100	61	63	66	67
Protection Cla		-	1,2	3-100		IPO		
Lubrication		-	1,2	3-100		Synthetic		
			, ,-		rtia (J1)	, , , , ,		
Stage	Ra	atio		unit	РАЕ42(ф8)	ΡΑΕ60(φ14)	ΡΑΕ90(φ19)	PAE115(φ24)
		3			0.04	0.23	0.77	2.30
1 5					0.03	0.21	0.67	1.92
					0.03	0.21	0.61	1.71
		7			0.03	0.21	0.60	1.65
	9,	/10		kg •cm²	0.03	0.21	0.60	1.63
Stage		atio			PAE42(φ8)	PAE60(φ14)/ PAE60T(φ8)	PAE90(φ19)/ PAE90T(φ14)	PAE115T(φ19)
		20/25			0.03	0.21 (0.03)	0.61(0.21)	0.61
2		35/49			0.03	0.21 (0.03)	0.60(0.21)	0.60
	40/45/50,	/63/70/100			0.03	0.21 (0.03)	0.60(0.21)	0.60

^{* 1.} Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.



^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio = 100 (2-stage).

XThe above figures/specifications are subject to change without prior notice.

PAER

The PAER Standard Series square mounting flange, caged standard class planetary gears, in a right angle housing through sizes to 115 mm. Offers a economic alternative of torque capacity, quiet operation with backlash as low as <11 arc-min. For general speed reduce applications.

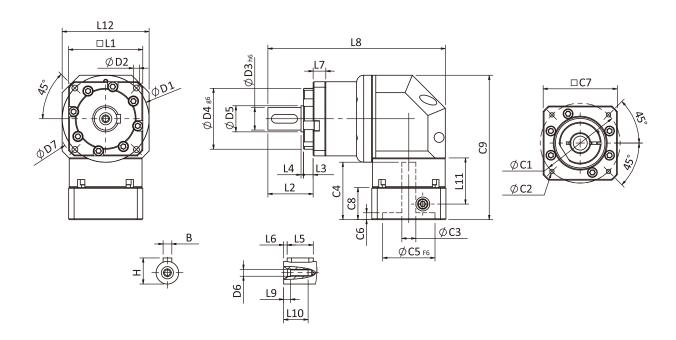


Frame Size (mm)	42, 60, 90, 115
Ratio	3:1-300:1
Nominal Input Speed (rpm)	2,500 - 4,500
Max Input Speed (rpm)	5,000 - 7,500
Backlash (arc-min)	1 Stage: 11-18 2 Stages: 13 - 20
Noise Level (dBA / 1m)	66 - 73

Features

- ► Right Angle Configuration.
- ➤ Output shaft, 13 mm through 32 mm diameter.
- ► Torque Capacity Range: 8 Nm through 240 Nm.
- ► Caged Planet Carrier: with standard planet gear set.
- ► High performance, efficiencies and low acoustics.
- ➤ Wide Range of Ratios: 10 single stage, 14 two stage ratios.
- ▶ Output Bearings deliver radial load capacity as high as 4200 N, and axial capacities up to 2600 N.
- ➤ Square Servo and Step Motor input: accommodates 40 mm through 130 mm, with optional sizes available.

PAER Single Stage Dimensions



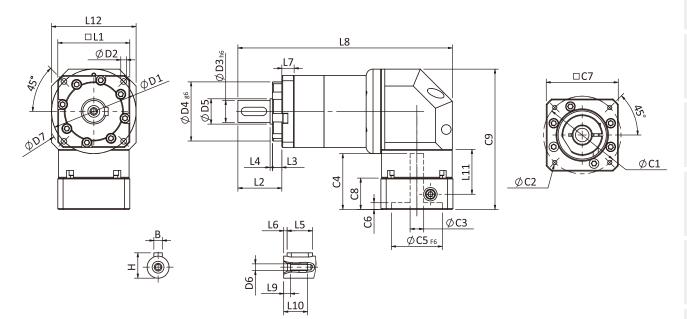
Dimensions	PAER42	PAER60	PAER90	PAER115
D1	50	70	100	-
D2	3.4	5.5	6.5	-
D3 h6	13	16	22	-
D4 g6	35	50	80	-
D5	15	20	35	-
D6	M4x0.7P	M5x0.8P	M8x1.25P	-
D7	56	80	118	-
L1	42.6	60	90	-
L2	26	37	48	-
L3	5.5	7	10	-
L4	1.5	1.5	1.5	-
L5	15	25	32	-
L6	2	2	3	-
L7	7.3	10	12	-
L8	102	143.6	194.5	-
L9	4	4	4.5	-
L10	14	16.5	20.5	-
L11	26.5	36	40.7	-
L12	50	70	98	-
C1 ²	46	70	90	-
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	-
C3 ²	≦8/≦11	<i>≦</i> 14/ <i>≦</i> 19	<u>≤</u> 19/ <u>≤</u> 24	-
C4 ²	33	44	57	-
C5 ² F6	30	50	70	-
C6 ²	4	4	6	-
C72	42.6	60	90	-
C8 ²	18.5	20	26	-
C9 ²	83	111.4	149.2	-
В	5	5	6	-
Н	15	18	24.5	-

 $[\]bigstar \ \mathsf{C1}\mathtt{\sim}\mathsf{C9} \ \mathsf{are} \ \mathsf{motor} \ \mathsf{specific} \ \mathsf{dimensions} \ \mathsf{(metric} \ \mathsf{std} \ \mathsf{shown)}. \ \mathsf{Size} \ \mathsf{may} \ \mathsf{vary} \ \mathsf{according} \ \mathsf{to} \ \mathsf{motor} \ \mathsf{flange}.$

 $[\]star$ Specification subject to change without notice.



PAER Double Stage Dimensions-1



Specifications	Unit:mm
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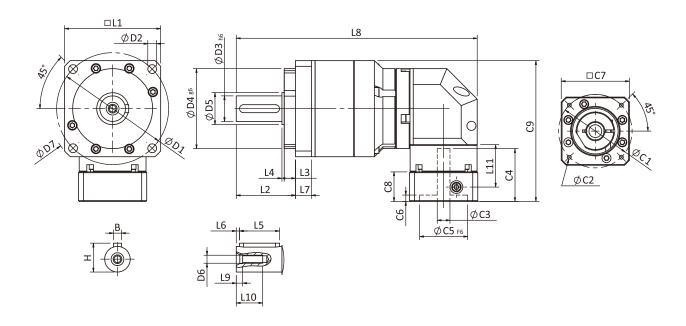
- p				
Dimensions	PAER42	PAER60	PAER90	PAER115
D1	50	70	100	-
D2	3.4	5.5	6.5	-
D3 _{h6}	13	16	22	-
D4 ₉₆	35	50	80	-
D5	15	20	35	-
D6	M4x0.7P	M5x0.8P	M8x1.25P	-
D7	56	80	118	-
L11	42.6 (44)	60	90	-
L2	26	37	48	-
L3	5.5	7	10	-
L4	1.5	1.5	1.5	-
L5	15	25	32	-
L6	2	2	3	-
L7	7.3	10	12	-
L8	126.9	174.3	235.5	-
L9	4	4	4.5	-
L10	14	16.5	20.5	-
L11	26.5	36	40.7	-
L12	50	70	98	-
C1 ²	46	70	90	-
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	-
C3 ²	≦8/≦11	<u>≤</u> 14/ <u>≤</u> 19	<u>≤</u> 19/ <u>≤</u> 24	-
C4 ²	33	44	57	-
C5 ² F6	30	50	70	-
C6 ²	4	4	6	-
C7 ²	42.6	60	90	-
C8 ²	18.5	20	26	-
C9 ²	83	111.4	149.2	-
В	5	5	6	-
Н	15	18	24.5	-

^{*1.} L1=44 when gear ratios are 100, 200, and 300.

 $^{^{\}star}$ 2. C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]bigstar$ Specification subject to change without notice.

PAER Double Stage Dimensions-2



Specifications		Unit:mm

Dimensions	PAER60T	PAER90T	PAER115T
D1	70	100	130
D2	5.5	6.5	9
D3 _{h6}	16	22	32
D4 _{g6}	50	80	110
D5	20	35	45
D6	M5x0.8P	M8x1.25P	M12x1.75P
D7	80	118	148
L1	60	90	115
L2	37	48	65
L3	7	10	12
L4	1.5	1.5	2
L5	25	32	40
L6	2	3	5
L7	10	12	16
L8	150.6	190.6	268.1
L9	4	4.5	6
L10	16.5	20.5	30
L11	26.5	36	40.7
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	≦8/≦11	<u>≤</u> 14/ <u>≤</u> 19	≦19/≦24
C4 ²	33	44	57
C5 ² F6	30	50	70
C6 ²	4	4	6
C72	42.6	60	90
C8 ²	18.5	20	26
C9 ²	88	121.4	157.7
В	5	6	10
Н	18	24.5	35

 $[\]star$ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]star$ Specification subject to change without notice.



PAER Specifications

Nominal Cut put Torque T,	:	Specifications		Stage	Ratio	PAER42	PAER60	PAER90	PAER115
Part							-		
Nominal Cutput Torque Tall						10			180
Nominal Output Torque Tay									
Nominal Output Torque T _{ans} N-m Stage Ratio PAERA2 PAERBO P									
Nominal Output Torque Table				1					
Nominal Output Torque Tanger Tange									
Nominal Output Torque T _{2N} N-m N-									210
Nominal Output Torque Torq									- 220
Nominal Output Torque Tail Num Stage Ratio PAER42 PAER60 PAER80 PAE									220
Nominal Input Speed nome						11			-
Part	Nominal Out	tput Torque T _{2N}	N•m	Stage			PAER60T	PAER90T	
Standard Backlash P2									
Standard Rigidity Arcmin 1 35 95 240 24									
Part									
Part						10			240
Nominal Input Speed n					50	11			240
Solid Sol				2		11			240
Part									
Part						11			240
Part					100	8	35	95	240
Part					120	11	35	95	240
Emergency Stor Torque T _{2xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx}					140	-	28	85	220
Nominal Input Speed n _{3N} Nom Nominal Nominal Output Torque) (*Max. Output Torque) (*Max. Output Torque) (*Nominal Nominal Nomi					200	8	21	65	190
Nominal Input Speed n _{3max} rpm 1,2 3-300 4500 4000 3000 2500					300				190
Nominal Input Speed n _{1max} rpm 1,2 3-300 4500 4000 3000 2500	Emergency St	op Torque T _{2NOT}	N•m	(2.5 times of Nominal Output Torque) (*Max. Output Torque T _{2n} =60% of Emergency Stop Torque)				e)	
Standard Backlash P2 arcmin 2 20-300 ≤ 18 20-300 ≤ 15 ≤ 13 ≤ 15 ≤ 13 ≤ 11 ≤ 15 ≤ 13 ≤ 11 ≤ 13 ≤ 10 < 12 3-300 410 700 1200 2600 2000 < 120 3-300 20,000 (10,000 Continuous Operation) < 13-15 1.1 2.1 2.95% < 13-15 <td>Nominal Inp</td> <td>put Speed n_{IN}</td> <td>rpm</td> <td>1,2</td> <td></td> <td></td> <td></td> <td></td> <td></td>	Nominal Inp	put Speed n _{IN}	rpm	1,2					
Standard Backlash P2	Max. Input	t Speed n _{1max}	rpm	1,2	3-300	7500	7000	6000	5000
Torsional Rigidity	Standard	Racklach D2	arcmin				_	≦ 13	≦ 11
Max. Radial Load F _{2x8}	Standard	Dackiasii i Z		2	20-300	≦ 20	≦ 17	≦ 15	<u>≤</u> 13
Max. Axial Load F _{2a8} ¹ N 1,2 3-300 410 700 1200 2600 Operating Temp. °C 3-300 3-300 20,000 (10,000 Continuous Operation) Service Life hr 3-300 20,000 (10,000 Continuous Operation) Efficiency % 1 3-15 ≥95% ≥90% Weight kg 1 3-15 1.1 2.1 6.5 13.4 Mounting Position - 1,2 3-100 Any Direction Noise Level 2 dBA/1m 1,2 3-100 Any Direction Noise Level 3 dBA/1m 1,2 3-100 5ynthetic Lubricant Lubrication 1 - 1,2 3-100 Synthetic Lubricant Inertia (J1) Stage Ratio unit PAER42(ф8) PAER60(ф14) PAER90(ф19) PAER115(ф24) Age-colspan="4">Age-colspan="4">PAER60(ф14) PAER90(ф19) PAER90(ф19) PAER90(ф19) PAER90(ф1	Torsiona	al Rigidity	N•m /arcmin	1,2	3-300	1.5	4.0	8.5	17
Operating Temp. °C 3-300 -10°C ~ +90°C Service Life hr 3-300 20,000 (10,000 Continuous Operation) Efficiency % 1 3-15 ≥95% Weight kg 1 3-15 1.1 2.1 6.5 13.4 Mounting Position - 1,2 3-100 Any Direction Noise Level 2 dBA/1m 1,2 3-100 66 8 70 73 Protection Class - 1,2 3-100 5ynthetic Lubricant Lubrication - 1,2 3-100 Synthetic Lubricant Stage Ratio unit PAER42(φ8) PAER60(φ14) PAER90(φ19) PAER115(φ24) PAER42(φ8) PAER60(φ14) PAER90(φ19) PAER115T(φ19) PAER42(φ8) PAER60(φ14) PAER90(φ19) PAER115T(φ19) PAER60(φ14) PAER90(φ19) PAER115T(φ19) PAER42(φ8) PAER60(φ14) PAER90(φ19) PAER115T(φ19)	Max. Radi	al Load F _{2rB} ¹	N	1,2	3-300	760	1250	2030	4200
Service Life hr 3-300 20,000 (10,000 Continuous Operation) Efficiency % 1 3-15 ≥95% Weight kg 1 3-15 ≥90% Weight kg 1 3-15 1.1 2.1 6.5 13.4 Mounting Position - 1,2 3-100 Any Direction 8.7/4.7 15.1 Noise Level ² dBA/1m 1,2 3-100 66 68 70 73 Protection Class - 1,2 3-100 TP65 1.2 3-100 Synthetic Lubricant Lubrication - 1,2 3-100 Synthetic Lubricant Inertia (J1) Stage Ratio unit PAER42(ф8) PAER60(ф14) PAER90(ф19) PAER115(ф24) 3, 4, 5, 7 0.07 0.40 2.0 2.7 Other Ratios kg•cm² PAER42(ф8) PAER60(ф14) PAER90(ф19) PAER115T(ф19) PAER90(ф19) </td <td>Max. Axia</td> <td>al Load F_{2aB}1</td> <td>N</td> <td>1,2</td> <td>3-300</td> <td>410</td> <td>700</td> <td>1200</td> <td>2600</td>	Max. Axia	al Load F _{2aB} 1	N	1,2	3-300	410	700	1200	2600
Efficiency % 1 2 20-300 3-15 20-300 ≥ 95% ≥ 90% Weight kg 1 	Operati	ing Temp.	℃		3-300		-10°C ∼	- +90℃	
Efficiency % 1 2 2 20-300 20-300 ≥ 95% ≥ 90% Weight kg 1 3-15 2 20-300 1.1 2.1 3.23 6.5 13.4 Mounting Position - 1,2 3-100 Any Direction Noise Level 2 dBA/1m 1,2 3-100 3-100 66 68 70 73 Protection Class - 1,2 3-100 TP65 Lubrication - 1,2 3-100 Synthetic Lubricant Inertia (J1) Stage Ratio unit PAER42(ф8) PAER60(ф14) PAER90(ф19) PAER115(ф24) 1 3, 4, 5, 7 0.07 0.40 2.0 2.7 Other Ratios Value 20, 25, 35 PAER42(ф8) PAER60(ф14) PAER90(ф19) PAER115(ф19) 2 20, 25, 35 Other Ratios 0.07 0.400, 0.07 PAER90(ф14) PAER90T(ф14) PA	Servi	ice Life	hr		3-300	20,000 (10,000 Continuous Operation)			
Noise Noi	- 500		01	1	3-15		≥ 9	5%	
Weight kg 2 20-300 1.3 3.2/3.0 8.7/4.7 15.1 Mounting Position - 1,2 3-100 - Any Direction Noise Level ² dBA/1m 1,2 3-100 66 68 70 73 Protection Class - 1,2 3-100 Synthetic Lubricant Stage Ratio unit PAER42(ф8) PAER60(ф14) PAER90(ф19) PAER115(φ24) 1 3, 4, 5, 7 0.07 0.40 2.0 2.7 Other Ratios Value *cm² PAER42(ф8) PAER60(φ14) PAER90(φ19) PAER115T(φ19) PAER42(φ8) PAER60(φ14) PAER90(φ19) PAER115T(φ19) PAER115T(φ19) 2 20, 25, 35 0.07 0.40/0.07 2.0/0.40 2.0 0.05 0.30/0.05 1.5/0.30 1.5 3.5	Effic	ciency	%	2					
Mounting Position Class Company Compa	\\/a	eight	ka						
Noise Level 2 dBA/Im 1,2 3-100 66 68 70 73			, vg		20-300	1.3			15.1
Protection Class − 1,2 3-100 IP65 Lubrication − 1,2 3-100 Synthetic Lubricant Inertia (J1) Stage Ratio unit PAER42(φ8) PAER60(φ14) PAER90(φ19) PAER115(φ24) 3, 4, 5, 7 0.07 0.40 2.0 2.7 Other Ratios 0.05 0.30 1.5 2.2 PAER42(φ8) PAER60(φ14) PAER60(φ19) PAER90(φ19) PAER90T(φ14) PAER115T(φ19) PAER42(φ8) PAER600T(φ8) PAER90T(φ14) PAER90T(φ14) PAER115T(φ19) 2 20, 25, 35 0.07 0.40/0.07 2.0/0.40 2.0 0.05 0.30/0.05 1.5/0.30 1.5			-	1,2	3-100		Any Di	rection	
Lubrication - 1,2 3-100 Synthetic Lubricant Inertia (J1) Stage Ratio unit PAER42(ф8) PAER60(ф14) PAER90(ф19) PAER115(ф24) 1 3, 4, 5, 7 0.07 0.40 2.0 2.7 Other Ratios 0.05 0.30 1.5 2.2 PAER42(ф8) PAER60(ф14) PAER60(ф19) PAER90(ф19) PAER90T(ф14) PAER115T(ф19) 2 20, 25, 35 0.07 0.40/0.07 2.0/0.40 2.0 0.05 0.30/0.05 1.5/0.30 1.5	Noise	e Level ²	dBA/1m		3-100	66	68	70	73
Stage Ratio unit PAER42(φ8) PAER60(φ14) PAER90(φ19) PAER115(φ24) 1 3, 4, 5, 7	Protect	ion Class	-	1,2	3-100		IP	65	
Stage Ratio unit PAER42(φ8) PAER60(φ14) PAER90(φ19) PAER115(φ24) 1 3, 4, 5, 7 0.07 0.40 2.0 2.7 Other Ratios 0.05 0.30 1.5 2.2 PAER42(φ8) PAER60(φ14) PAER60(φ19) PAER90(φ19) PAER90T(φ14) PAER115T(φ19) 2 20, 25, 35 0.07 0.40/0.07 2.0/0.40 2.0 Other Ratios 0.05 0.30/0.05 1.5/0.30 1.5	Lubr	ication	-	1,2	3-100		Synthetic	Lubricant	
1 3, 4, 5, 7						Inertia (J1)			
1 Other Ratios Stage Ratio 2 20, 25, 35 Other Ratios Neg•cm²	Stage	Rati	0		unit	PAER42(φ8)	PAER60(φ14)	PAER90(φ19)	PAER115(φ24)
Stage Ratio kg•cm² PAER42(φ8) PAER60(φ14) PAER60T(φ18) PAER90(φ19) PAER90T(φ14) PAER115T(φ19) 2 20, 25, 35 0.07 0.40/0.07 2.0/0.40 2.0 Other Ratios 0.05 0.30/0.05 1.5/0.30 1.5	1	3, 4, 5	, 7			0.07	0.40	2.0	2.7
Stage Ratio kg•cm² PAER42(ψο) PAER60T(φ8) PAER90T(φ14) PAER113T(ψ19) 2 20, 25, 35 0.07 0.40/0.07 2.0/0.40 2.0 Other Ratios 0.05 0.30/0.05 1.5/0.30 1.5	1	Other R	atios			0.05	0.30	1.5	2.2
2 Other Ratios 0.05 0.30/0.05 1.5/0.30 1.5	Stage	Rati	0		kg•cm²	PAER42(φ8)			PAER115T(φ19)
Other Ratios 0.05 0.30/0.05 1.5/0.30 1.5		20, 25,	35			0.07	0.40/0.07	2.0/0.40	2.0
	2	Other R	atios			0.05	0.30/0.05	1.5/0.30	1.5
	* 1 Applied to	L		00 rpm		3.33	1, 0.00	2.5, 5.50	

^{* 1.} Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio =

^{**}The above figures/specifications are subject to change without prior notice.

PAN

The PAN Standard Series gearboxes are equipped with a NEMA output flange with metric shaft, to offer exceptional torque ratings and capacity for many of present servo and stepper motion control applications. The gearboxes are drop-ins for most industry standards and available from single to three stages with ratios 3:1 up to 1000:1, the best backlash of <6 arc-minutes. Adapters for all servo and stepper motors.



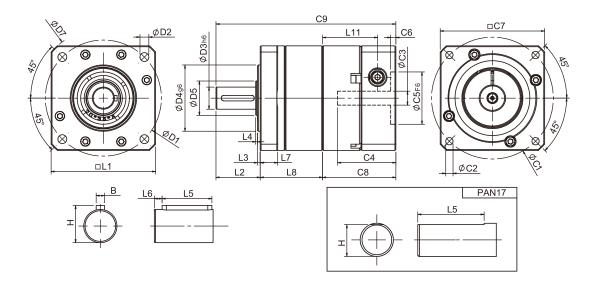
PGFR

Frame Size (mm)	17, 23, 34, 42, 56
Ratio	3:1-1000:1
Nominal Input Speed (rpm)	2,500 - 4,000
Max Input Speed (rpm)	5,000 - 6,000
Backlash (arc-min)	1 Stage: 6 - 9 2 Stages: 8 - 12 3 Stages: 12 - 15
Noise Level (dBA / 1m)	60 - 67

Features

- ► NEMA spec motor bracket
- ► Torque capacity range: 8 Nm through 215 Nm.
- ► Caged planet carrier: with standard planet gear set
- ► High performance, efficiencies and low acoustics.
- ▶ Wide range of ratios up to 1000:1.
- Output bearings deliver radial load capacity as high as 4760 N, and axial capacities up to 2630 N.

PAN Single Stage Dimensions



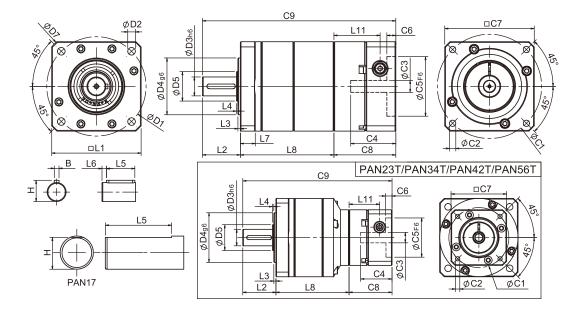
Dimensions	PAN17	PAN23	PAN34	PAN42	PAN56
D1	43.8	66.67	98.425	125.73	177.8
D2	3.25	5.1	5.6	7.1	10.2
D3h6	9.525	12.7	19.05	25	25
D4 _{g6}	21.97	38.1	73.025	55.55	114.3
D5	12	20	35	32	-
D7	56	80	118	148	195
L1	42.6 (44) ¹	60	90	115	145
L2	25.4	25.4	31.75	42	41
L3	1.6	1.6	1.7	2.4	4
L4	1	1	1	2	-
L5	19.05	19.05	25.4	32	32
L6	-	3	3	4	4
L7	6.5	10	12	19	20
L8	28.8	35.8	43.5	67.4	68.4
L11	26.9	31.6	37.3	51.8	51.8
C1 ²	46	70	90	145	145
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P
C3 ²	≦8/≦11	≦14/≦19	≦19/≦24/≦28	≦24/≦32/≦38	≦24/≦32/≦38
C4 ²	26.5	33.5	41	51.5	51.5
C5 ² F6	30	50	70	110	110
C6 ²	4	4	6	6	6
C7 ²	42.6	60	90	130	130
C8 ²	36.4	42.1	51.5	68	68
C9 ²	90.6	103.3	126.75	177.4	177.4
В	-	3.175	4.763	8	8
Н	9.14	14.1	21.1	28	28

 $[\]star$ Specification subject to change without notice.



[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

PAN Double Stage Dimensions



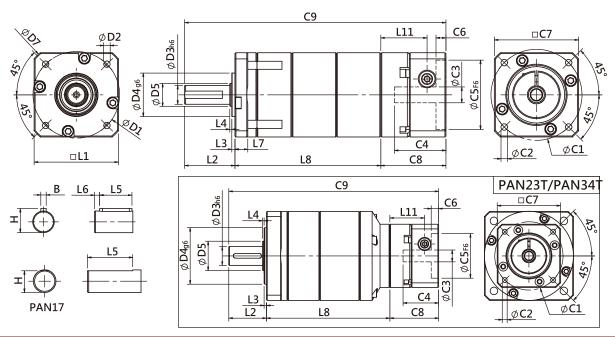
Dimensions	PAN17	PAN23	PAN23T	PAN34	PAN34T	PAN42T	PAN56T
D1	43.8	66	.67	98.	425	125.73	177.8
D2	3.25	5	.1	5	.6	7.1	10.2
D3h6	9.525	12	2.7	19	.05	25	25
D4 _{g6}	21.97	38	3.1	73.	025	55.55	114.3
D5	12	2	20	3	5	32	-
D7	56	8	80	1:	18	148	195
L1	42.6 (44) ¹	6	50	9	0	115	145
L2	25.4	25	5.4	31	.75	42	41
L3	1.6	1	.6	1	.7	2.4	4
L4	1	1			1		-
L5	19.05	19.05		25.4		32	32
L6	-		3		3		4
L7	6.5	1	10		12		20
L8	51.25	62.8	56.1	77.3	72.8	105.5	106.5
L11	23.4	31	23.4	37.3	31	37.3	37.3
C1 ²	46	70	46	90	70	90	90
C2 ²	M4x0.7P	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P	M6x1.0P	M6x1.0P
C3 ²	≦8/≦11	≦14/≦19	≦8/≦11	≦19/≦24/≦28	≦14/≦19	<i>≦</i> 19/ <i>≦</i> 24/ <i>≦</i> 28	≦19/≦24/≦28
C4 ²	26.5	33.5	26.5	41	33.5	41	41
C5 ² F6	30	50	30	70	50	70	70
C6 ²	4	4	4	6	4	6	6
C7 ²	42.6	60	42.6	90	60	90	90
C8 ²	32.9	41.5	32.9	51.5	41.5	51.5	51.5
C9 ²	109.55	129.7	114.4	160.55	146.05	199	199
В	_	3.1	L75	4.7	763	8	8
Н	9.14	14	4.1	23	L.1	28	28

 $[\]star$ L1=44 when gear ratio is 100.

 $[\]star$ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]bigstar$ Specification subject to change without notice.

PAN Triple Stage Dimensions



Specifications

Unit:mm

Dimensions	PAN17	PAN23T	PAN34T
D1	43.8	66.67	98.425
D2	3.25	5.1	5.6
D3h6	9.525	12.7	19.05
D4 ₉₆	21.97	38.1	73.025
D5	12	20	35
D7	56	80	118
L1	42.6 (44)	60	90
L2	25.4	25.4	31.75
L3	1.6	1.6	1.7
L4	1	1	1
L5	19.05	19.05	25.4
L6	-	3	3
L7	6.5	10	12
L8	73.7	83.1	106.6
L11	23.4	23.4	31
C1 ²	46	46	70
C2 ²	M4x0.7P	M4x0.7P	M5x0.8P
C3 ²	≦8/≦11	≦8/≦11	<i>≦</i> 14/ <i>≦</i> 19
C4 ²	26.5	26.5	33.5
C5 ² F6	30	30	50
C6 ²	4	4	4
C7 ²	42.6	42.6	60
C8 ²	32.9	32.9	41.5
C9 ²	132	141.4	179.85
В	-	3.175	4.763
Н	9.14	14.1	21.1

 $[\]bigstar$ L1=44 when gear ratio is 1000.

[★] Specification subject to change without notice.



[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

PAN Specifications

Stage Ratio PANIZ PANI	Specifications		Stage	Ratio	PAN17	PAN23	PAN34	PAN42	PAN56	
The content of the					3	9	28	85	200	200
Part					4	10	32	80	215	215
Part				1	5	11	35	95	215	215
Nominal Output Torque T					7	10	28	85	200	200
Nominal Output Torque T					9	8	23	75	195	195
Nominal Output Torque T										<u> </u>
Nominal Output Torque T Nominal Input Speed n Nominal Input				_						
Nominal Output Torque T ₂₀₀				Stage	Ratio	PAN17			PAN42T	PAN56T
Nominal Cutput Torque T _{ax}					15	11			168	168
Nominal Output Torque T _{2N}					20	11	35/31	95/95	215	215
Nominal Output Torque T										
Nominal Output Torque T _{2N} N+m 2 45 45 11 35/277 95/92 200 200 70 (Ratio 49):10 82/28 85/85 200 200 200 90 Ratio 81):10 82/28 85/85 200 200 200 90 Ratio 81):10 82/28 85/85 100 180 180 180 180 180 180 1										
Sol			NI ma	2						
Part	Nominal Out	put Iorque I _{2N}	IN•M	2						
Stage Ratio PAN12T PAN34T PAN42T PAN56T PAN56T PAN12T PAN56T PAN12T PAN35T PAN34T PAN42T PAN56T PAN12T PAN35T PAN34T PAN42T PAN56T PAN12T PAN35T PAN35T PAN34T PAN35T PAN										
Stage Ratio PAN17 PAN23T PAN34T PAN42T PAN56T										
Stage									-	
125					100	8	21/21	65/65	180	180
Total				Stage	Ratio	PAN17	PAN23T		PAN42T	
Standard Backlash P2										
Standard Backlash P2					175	11	35	95	215	215
Standard Backlash P2					225	11	35	95	215	215
Standard Backlash P2					245	11	35	95	215	215
Mominal Input Speed n				3		11		95		
Service Life				3						
Part										
Emergency Stop Torque T _{2NOT} N+m 1,2,3 3-1000 8 2.1 65 180 180 180										
Emergency Stop Torque T _{2NOF} N+m										
Nominal Input Speed n _{Inst} rpm 1,2,3 3-1000 4000 4000 3000 2500 2500					1000					180
Max Input Speed n₁max rpm 1,2,3 3-1000 6000 6000 6000 5000 5000 Standard Backlash P2 arcmin 2 15-100 ≤12 ≤10 ≤9 ≤8 <8	Emergency St	op Torque T _{2NOT}	N∙m	(2.5 times of Nominal Output Torque) (*Max. Output Torque T₂в=60% of Emergency Stop Torque)						
Standard Backlash P2 arcmin 1 3-10 ≤ 9 ≤ 8 ≤ 7 ≤ 6 ≤ 6 ≤ 6 ≤ 8 ≤ 12	Nominal Inp	out Speed n _{in}	rpm	1,2,3	3-1000	4000	4000	3000	2500	2500
$ \begin{array}{ c c c c c c } \hline Standard Backlash P2 & arcmin & 2 & 15-100 & \leq 12 & \leq 10 & \leq 9 & \leq 8 & \leq 8 \\ \hline Standard Backlash P2 & N-m & 2.2 & 15-1000 & \leq 15 & \leq 12 & \leq 12 & \leq 12 \\ \hline Torsional Rigidity & /N-m / Arcmin & 1.2.3 & 3-1000 & 1.2 & 3.5 & 8.5 & 17 & 17 \\ \hline Max. Radial Load F_{2ab}^{-1} & N & 1.2.3 & 3-1000 & 580 & 960 & 2160 & 4760 & 4760 \\ \hline Max. Axial Load F_{2ab}^{-1} & N & 1.2.3 & 3-1000 & 410 & 430 & 1100 & 2630 & 2630 \\ \hline Operating Temp. & ^*C & 1.2.3 & 3-1000 & & -10^*C \sim +90^*C \\ \hline Service Life & hr & 1.2.3 & 3-1000 & & -10^*C \sim +90^*C \\ \hline Service Life & hr & 1.2.3 & 3-1000 & & 20,000(10,000 Continuous operation) \\ \hline Efficiency & \% & 2 & 15-100 & & & & & & & & & & & & & & & & & & $	Max. Input	Speed n _{1max}	rpm	1,2,3	3-1000	6000	6000	6000	5000	5000
Torsional Rigidity				1	3-10	<u>≤</u> 9	≦8	<u>≤</u> 7	<u>≤</u> 6	<u>≤</u> 6
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Standard Backlash P2		arcmin	2	15-100	≤ 12	≤ 10	≤ 9	≤ 8	≤ 8
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$				3	125-1000					
Max. Radial Load F₂₁₁²¹ N 1,2,3 3-1000 580 960 2160 4760 4760 Max. Axial Load F₂₁₃¹ N 1,2,3 3-1000 410 430 1100 2630 2630 Operating Temp. °C 1,2,3 3-1000 20,000(10,000 Continuous operation) Service Life hr 1,2,3 3-1000 20,000(10,000 Continuous operation) Efficiency % 2 15-100 290% 290% Efficiency % 1 3-10 290% 290% Weight kg 2 15-100 0.5 1.1 2.8 6.3 6.6 Weight kg 2 15-100 0.7 1.5/1.3 4.2/3.1 7.9 8.2 Weight kg 2 15-100 0.7 1.5/1.3 4.2/3.1 7.9 8.2 Mounting Position - 1,2,3 3-1000 60 63 66 67 67 Protection Class -	Torsional Rigidity			1.2.3	3-1000					
Max. Axial Load F _{2aB} ¹ N 1,2,3 3-1000 410 430 1100 2630 2630 Operating Temp. °C 1,2,3 3-1000 20,000(10,000 Continuous operation) Service Life hr 1,2,3 3-1000 20,000(10,000 Continuous operation) Efficiency % 1 3-10 ≥ 95% Efficiency % 2 15-100 295% Begin Mounting Position kg 2 15-100 0.5 1.1 2.8 6.3 6.6 Weight kg 2 15-100 0.7 1.5/1.3 4.2/3.1 7.9 8.2 Mounting Position - 1,2,3 3-1000 0.8 1.7 4.5 9.3 9.6 Mounting Position - 1,2,3 3-1000 Any Direction 4.5 9.3 9.6 Postage dBA/1m 1,2,3 3-1000 Synthetic Lubricant Inertia (I1) Stage Ratio kg•cm² PAN17(\$\phi8) <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>4760</td> <td></td>									4760	
Operating Temp. °C 1,2,3 3-1000 -10°C ~ +90°C Service Life hr 1,2,3 3-1000 20,000(10,000 Continuous operation) Efficiency % 2 15-100 ≥ 95% ≥ 95% ≥ 90% ≥ 85% Weight kg 1 3-10 0.5 1.1 2.8 6.3 6.6 Weight kg 2 15-100 0.7 1.5/1.3 4.2/3.1 7.9 8.2 Mounting Position - 1,2,3 3-1000 0.8 1.7 4.5 9.3 9.6 Mounting Position - 1,2,3 3-1000 60 63 66 67 67 Protection Class - 1,2,3 3-1000 Synthetic Lubrication Synthetic Lubrication Stage Ratio unit PAN17(\$\phi 8) PAN23(\$\phi 1) PAN34(\$\phi 1) PAN42(\$\phi 2) PAN56(\$\phi 2) 1 4 0.04 0.23 0.77 2.30 2.30 2.30 <td></td>										
Service Life hr 1,2,3 3-1000 20,000(10,000 Continuous operation) Efficiency % 1 3-10 ≥ 95% 2 15-100 ≥ 85% 2 15-100 0.5 1.1 2.8 6.3 6.6 Weight kg 2 15-100 0.7 1.5/1.3 4.2/3.1 7.9 8.2 Mounting Position - 1,2,3 3-1000 0.8 1.7 4.5 9.3 9.6 Mounting Position - 1,2,3 3-1000 60 63 66 67 67 Protection Class - 1,2,3 3-1000 5ynthetic Lubricant 10ertia (J1) 10ertia (J						410	430		2630	2630
Efficiency % 1 3-10 15-100 2 15-100 3 125-1000 ≥ 95% ≥ 90% ≥ 85% Weight kg 1 3-10 0 0.5 1.1 28.8 6.3 6.6 4.2/3.1 7.9 8.2 15-100 0.8 1.7 4.5 9.3 9.6 6.6 1.7 4.5 9.3 9.6 Mounting Position - 1,2,3 3-1000 0.8 1.7 4.5 9.3 9.6 9.6 9.3 9.6 Mounting Position - 1,2,3 3-1000 0.60 6.0 6.3 6.6 6.7 6.7 6.7 Protection Class - 1,2,3 3-1000 0.0 5ynthetic Lubricant Inertia (J1) Stage Ratio unit PAN17(\$\phi 8) PAN23(\$\phi 14) PAN34(\$\phi 19) PAN42(\$\phi 24) PAN56(\$\phi 24) PAN56(\$\phi 24) PAN34(\$\phi 19) PAN3										
Efficiency % 2 15-100 ≥ 90% ≥ 85% Weight kg 1 3-10 0.5 1.1 2.8 6.3 6.6 Weight kg 2 15-1000 0.7 1.5/1.3 4.2/3.1 7.9 8.2 3 125-1000 0.8 1.7 4.5 9.3 9.6 Mounting Position - 1,2,3 3-1000 Any Direction Noise Level 2 dBA/1m 1,2,3 3-1000 60 63 66 67 67 Protection Class - 1,2,3 3-1000 Synthetic Lubricant Inertia (J1) Inertia (J1) Inertia (J1) Synthetic Lubricant Inertia (J1) Ine	Servi	ce Lite	nr							
Noise Level 2 ABA/Im 1,2,3 3-1000 3-1000 Any Direction	LCC: -		0/							
Weight kg 1 3-10 0 0.5 1.5-100 0.7 1.5/1.3 4.2/3.1 7.9 8.2 4.2/3.1 7.9 8.2 1.25-1000 0.8 1.7 4.5 9.3 9.6 Mounting Position Noise Level ² dBA/1m 1,2,3 3-1000 Noise Leve	ETTIC	lericy	70							
Weight kg 2 15-100 0.7 1.5/1.3 4.2/3.1 7.9 8.2 Mounting Position - 1,2,3 3-1000 Any Direction Noise Level ² dBA/1m 1,2,3 3-1000 60 63 66 67 67 Protection Class - 1,2,3 3-1000 Synthetic Lubricant Lubrication - 1,2,3 3-1000 Synthetic Lubricant Stage Ratio unit PAN17(φ8) PAN23(φ14) PAN34(φ19) PAN42(φ24) PAN56(φ24) Stage Ratio unit PAN17(φ8) PAN23(φ14) PAN34(φ19) PAN42(φ24) PAN56(φ24) Stage Ratio kg•cm² PAN17(φ8) PAN23(φ14)/PAN23T(φ8) PAN34T(φ14)/PAN34T(φ19) PAN42T(φ19) PAN56T(φ24) Stage Ratio PAN17(φ8) PAN23T(φ8) PAN34T(φ14) PAN42T(φ19) PAN56T(φ24) 3 All Ratios O.03 0.03 0.21 0.61 0.61										
Stage Ratio Ratio Ratio Ratio Ratio Ratio PAN17(φ8) PAN23(φ14) PAN34(φ19) PAN42T(φ19) PAN56T(φ24)			1 , 1							
Mounting Position - 1,2,3 3-1000 Any Direction Noise Level ² dBA/1m 1,2,3 3-1000 60 63 66 67 67 Protection Class - 1,2,3 3-1000 IP65 Lubrication - 1,2,3 3-1000 Synthetic Lubricant Stage Ratio unit PAN17(φ8) PAN23(φ14) PAN34(φ19) PAN42(φ24) PAN56(φ24) 1 4 0.04 0.23 0.77 2.30 2.30 1 4 0.03 0.21 0.67 1.92 1.92 5 ~10 kg •cm² PAN17(φ8) PAN23(φ14)/PAN23(φ14)/PAN34(φ19)/PAN34(φ19)/PAN34(φ19)/PAN34(φ19)/PAN34T(φ14) PAN42T(φ19) PAN56T(φ24) 2 15 0.04 0.23 (0.04) 0.77 (0.23) 0.77 0.77 0.03 0.21 (0.03) 0.67 (0.21) 0.61 0.61 0.61 2 15 0.04 0.23 (0.04) 0.77 (0.23) 0.77 0.77 0.03	We	eight	kg		15-100	0.7	1.5/1.3			
Noise Level ² dBA/1m 1,2,3 3-1000 60 63 66 67 67 Protection Class - 1,2,3 3-1000 Synthetic Lubricant Lubrication - 1,2,3 3-1000 Synthetic Lubricant Inertia (J1) Stage Ratio unit PAN17(ф8) PAN23(ф14) PAN34(ф19) PAN42(ф24) PAN56(ф24) 1 4 0.04 0.23 0.77 2.30 2.30 1 4 0.03 0.21 0.67 1.92 1.92 5 ~10 kg •cm² PAN17(ф8) PAN23(ф14)/PAN23(ф14)/PAN34(ф19)/PAN34(ф19)/PAN34(ф19)/PAN34(ф19)/PAN34T(ф19) PAN42T(ф19) PAN56T(ф24) 2 15 0.04 0.23 (0.04) 0.77 (0.23) 0.77 0.77 0.03 0.21 (0.03) 0.67 (0.21) 0.61 0.61 0.61 Stage Ratio PAN17(ф8) PAN23T(ф8) PAN34T(ф14) PAN42T(ф19) PAN42T(ф19) PAN56T(ф24)					125-1000	0.8	1.7		9.3	9.6
Protection Class - 1,2,3 3-1000 IP65 Lubrication - 1,2,3 3-1000 Synthetic Lubricant Inertia (J1) Stage Ratio unit PAN17(φ8) PAN23(φ14) PAN34(φ19) PAN42(φ24) PAN56(φ24) 1 4 0.04 0.23 0.77 2.30 2.30 0.03 0.21 0.67 1.92 1.92 5 ~10 0.03 0.21 0.61 1.71 1.71 Stage Ratio kg•cm² PAN17(φ8) PAN23(φ14)/PAN34T(φ14) PAN34(φ19)/PAN34T(φ19) PAN56T(φ24) 2 15 0.04 0.23 (0.04) 0.77 (0.23) 0.77 0.77 0.03 0.21 (0.03) 0.67 (0.21) 0.61 0.61 0.61 Stage Ratio PAN17(φ8) PAN23T(φ8) PAN34T(φ14) PAN42T(φ19) PAN56T(φ24) 3 All Ratios 0.03 0.03 0.03 0.21 0.61 0.61			-	1,2,3	3-1000			Any Direction		
Lubrication - 1,2,3 3-1000 Synthetic Lubricant Inertia (J1) Stage Ratio unit PAN17(φ8) PAN23(φ14) PAN34(φ19) PAN42(φ24) PAN56(φ24) 1 4 0.04 0.23 0.77 2.30 2.30 0.03 0.21 0.67 1.92 1.92 0.03 0.21 0.61 1.71 1.71 2 15 PAN17(φ8) PAN23(φ14)/PAN34T(φ14) PAN42T(φ19) PAN56T(φ24) 3 All Ratios PAN17(φ8) PAN23T(φ8) PAN34T(φ14) PAN42T(φ19) PAN56T(φ24) 9AN17(φ8) PAN23T(φ8) 0.67 (0.21) 0.61 0.61 0.61 Stage Ratio PAN17(φ8) PAN23T(φ8) PAN34T(φ14) PAN42T(φ19) PAN56T(φ24) 3 All Ratios 0.03 0.03 0.21 0.61 0.61	Noise Level ²		dBA/1m	1,2,3	3-1000	60	63	66	67	67
Lubrication - 1,2,3 3-1000 Synthetic Lubricant Inertia (J1) Stage Ratio unit PAN17(φ8) PAN23(φ14) PAN34(φ19) PAN42(φ24) PAN56(φ24) 1 4 0.04 0.23 0.77 2.30 2.30 0.03 0.21 0.67 1.92 1.92 0.03 0.21 0.61 1.71 1.71 2 15 PAN17(φ8) PAN23(φ14)/PAN34T(φ14) PAN42T(φ19) PAN56T(φ24) 3 All Ratios PAN17(φ8) PAN23T(φ8) PAN34T(φ14) PAN42T(φ19) PAN56T(φ24) 9AN17(φ8) PAN23T(φ8) 0.67 (0.21) 0.61 0.61 0.61 Stage Ratio PAN17(φ8) PAN23T(φ8) PAN34T(φ14) PAN42T(φ19) PAN56T(φ24) 3 All Ratios 0.03 0.03 0.21 0.61 0.61	Protection Class							IP65		
Stage Ratio unit PAN17(φ8) PAN23(φ14) PAN34(φ19) PAN42(φ24) PAN56(φ24)	Lubrication -						Sı	nthetic Lubrican	ıt	
Stage Ratio unit PAN17(φ8) PAN23(φ14) PAN34(φ19) PAN42(φ24) PAN56(φ24) 1 3 0.04 0.23 0.77 2.30 2.30 1 4 0.03 0.21 0.67 1.92 1.92 5~10 0.03 0.21 0.61 1.71 1.71 Stage Ratio kg•cm² PAN17(φ8) PAN23(φ14)/PAN34T(φ19)/PAN34T(φ19)/PAN34T(φ19) PAN42T(φ19) PAN56T(φ24) 2 15 0.04 0.23 (0.04) 0.77 (0.23) 0.77 0.77 0.03 0.21 (0.03) 0.67 (0.21) 0.61 0.61 Stage Ratio PAN17(φ8) PAN23T(φ8) PAN34T(φ14) PAN42T(φ19) PAN56T(φ24) 3 All Ratios 0.03 0.03 0.21 0.61 0.61										
3 0.04 0.23 0.77 2.30 2.30 5~10 0.03 0.21 0.67 1.92 1.92 Stage Ratio kg•cm² PAN17(φ8) PAN23(φ14)/PAN23T(φ8) PAN34(φ19)/PAN34T(φ19) PAN42T(φ19) PAN56T(φ24) 2 15 0.04 0.23 (0.04) 0.77 (0.23) 0.77 0.77 0.03 0.21 (0.03) 0.67 (0.21) 0.61 0.61 Stage Ratio PAN17(φ8) PAN23T(φ8) PAN34T(φ14) PAN42T(φ19) PAN56T(φ24) 3 All Ratios 0.03 0.03 0.21 0.61 0.61	Stage	Stage Ratio			unit		PAN23(δ14)	PAN34(h19)	PAN42(d24)	PAN56(d24)
1 4 0.03 0.21 0.67 1.92 1.92 1.92 0.03 0.21 0.61 1.71 1.71 1.71 1.71 1.71 1.71 1.71 1	90							-	-	
Stage Ratio Rat	1		0							
Stage Ratio kg•cm² PAN17(φ8) PAN23(φ14)/PAN23T(φ8) PAN34(φ19)/PAN34T(φ19) PAN42T(φ19) PAN56T(φ24) 2 15 0.04 0.23 (0.04) 0.77 (0.23) 0.77 0.77 3 Ratio 0.03 0.21 (0.03) 0.67 (0.21) 0.61 0.61 3 All Ratios 0.03 0.03 0.03 0.21 0.61 0.61										
Stage Ratio Restrict PAN17(\(\phi\)8) PAN23T(\(\phi\)8) PAN34T(\(\phi\)14) PAN42T(\(\phi\)19) PAN56T(\(\phi\)24) 2 15 0.04 0.23 (0.04) 0.77 (0.23) 0.77 0.77 Other Ratios 0.03 0.21 (0.03) 0.67 (0.21) 0.61 0.61 Stage Ratio PAN17(\(\phi\)8) PAN23T(\(\phi\)8) PAN34T(\(\phi\)14) PAN42T(\(\phi\)19) PAN56T(\(\phi\)24) 3 All Ratios 0.03 0.03 0.21 0.61 0.61		5~1				0.03			1./1	1./1
Z Other Ratios 0.03 0.21 (0.03) 0.67 (0.21) 0.61 0.61 Stage Ratio PAN17(φ8) PAN23T(φ8) PAN34T(φ14) PAN42T(φ19) PAN56T(φ24) 3 All Ratios 0.03 0.03 0.21 0.61 0.61	Stage Ratio			kg•cm²	PAN17(φ8)	PAN23T(φ8)	PAN34T(φ14)	PAN42T(φ19)	PAN56T(φ24)	
Stage Ratio PAN17(ф8) PAN23T(ф8) PAN34T(ф14) PAN42T(ф19) PAN56T(ф24) 3 All Ratios 0.03 0.03 0.21 0.61 0.61						0.04	0.23 (0.04)	0.77 (0.23)	0.77	0.77
Stage Ratio PAN17(φ8) PAN23T(φ8) PAN34T(φ14) PAN42T(φ19) PAN56T(φ24) 3 All Ratios 0.03 0.03 0.21 0.61 0.61	Other R		atios			0.03	0.21 (0.03)	0.67 (0.21)	0.61	0.61
3 All Ratios 0.03 0.03 0.21 0.61 0.61										
	3									- 11
						0.03	0.03	0.21	0.01	1 0.01

^{* 1.} Applied to the output shaft center at 100 rpm.

^{* 2.} Measured at 3000 rpm with no load. These values are measured by gearbox with ratio = 10 (1-stage) or ratio = 100 (2-stage) at nominal input speed or 3000 rpm (if nominal input speed is higher than 3000 rpm) with no load. * The above figures/specifications are subject to change without prior notice.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

PANR

The PANR Primary Series are right angle configuration gearboxes equipped with a NEMA spec output flange and shaft, to offer exceptional torque ratings and capacity for many of present servo and stepper motion control applications. The gearboxes are drop-ins for most industry standards and available with ratios 3:1 up to 300:1. Adapters for all servo and stepper motors.



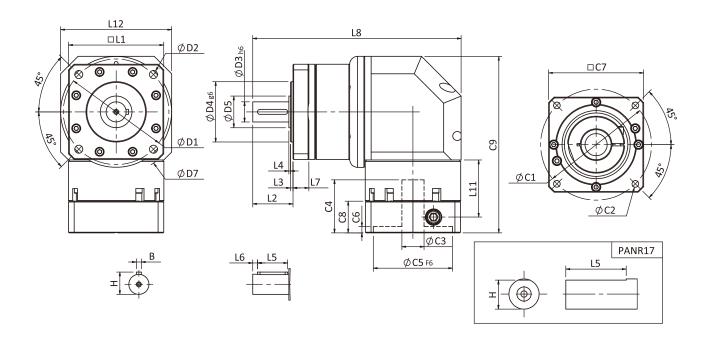
PUA

Frame Size (mm)	17, 23, 34, 42, 56
Ratio	3:1 - 300:1
Nominal Input Speed (rpm)	2,500 - 4,500
Max Input Speed (rpm)	5,000 - 7,500
Backlash (arc-min)	1 Stage: 11 - 18 2 Stages: 13 - 20
Noise Level (dBA / 1m)	66 - 73

Features

- ► NEMA spec flange.
- ► Torque capacity range: 8 Nm through 215 Nm.
- ► Caged planet carrier: with standard planet gear set.
- ► High performance, efficiencies and low acoustics.
- ➤ Wide range of ratios up to 300:1.
- ▶ Output bearings deliver radial load capacity as high as 4370 N, and axial capacities up to 2630 N.

PANR Single Stage Dimensions



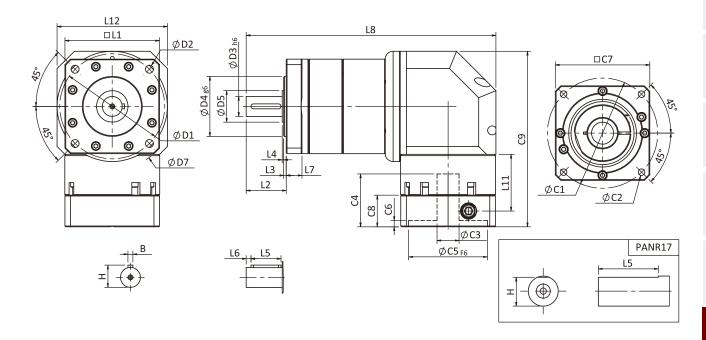
Dimensions	PANR17	PANR23	PANR34	PANR42
D1	43.8	66.67	98.425	-
D2	3.25	5.1	5.6	-
D3h6	9.525	12.7	19.05	-
D4 ₉₆	21.97	38.1	73.025	-
D5	12	20	35	-
D7	56	80	118	-
L1	42.6	60	90	-
L2	25.4	25.4	31.75	-
L3	1.6	1.6	1.7	-
L4	1	1	1	-
L5	19.05	19.05	25.4	-
L6	-	3	3	-
L7	6.5	10	12	-
L8	105.2	131.5	182.25	-
L11	26.5	36	40.7	-
L12	50	70	98	-
C1 ²	46	70	90	-
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	-
C3 ²	≦8/≦11	<i>≦</i> 14/ <i>≦</i> 19	<u>≤</u> 19/ <u>≤</u> 24	-
C4 ²	33	44	57	-
C5 ² F6	30	50	70	-
C6 ²	4	4	6	-
C72	42.6	60	90	-
C8 ²	18.5	20	26	-
C9 ²	83	111.4	149.2	-
В	-	3.175	4.763	-
Н	9.14	14.1	21.1	-

 $[\]star$ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]bigstar$ Specification subject to change without notice.



PANR Double Stage Dimensions-1



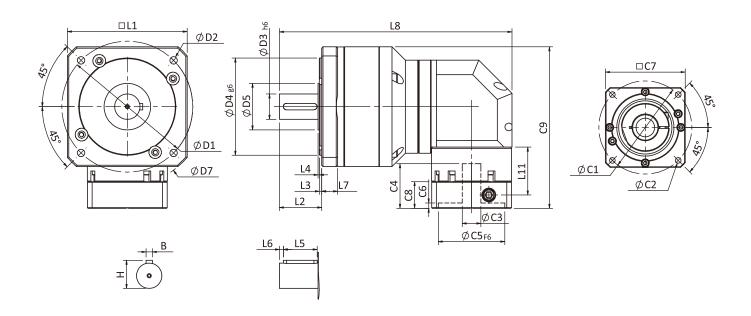
Dimensions	PANR17	PANR23	PANR34	PANR42
D1	43.8	66.67	98.425	-
D2	3.25	5.1	5.6	-
D3h6	9.525	12.7	19.05	-
D4 ₉₆	21.97	38.1	73.025	-
D5	12	20	35	-
D7	56	80	118	-
L11	42.6 (44) ¹	60	90	-
L2	25.4	25.4	31.75	-
L3	1.6	1.6	1.7	-
L4	1	1	1	-
L5	19.05	19.05	25.4	-
L6	-	3	3	-
L7	6.5	10	12	-
L8	127.65	158.5	216.05	-
L11	26.5	36	40.7	-
L12	50	70	98	-
C1 ²	46	70	90	-
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	-
C3 ²	≦8/≦11	≦14/≦19	≦19/≦24	-
C4 ²	33	44	57	-
C5 ² _{F6}	30	50	70	-
C6 ²	4	4	6	-
C7 ²	42.6	60	90	-
C8 ²	18.5	20	26	-
C9 ²	83	111.4	149.2	-
В	-	3.175	4.763	-
Н	9.14	14.1	21.1	-

^{*1.} L1=44 when gear ratios are 100, 200, and 300.

^{*2.} C1~C9 are motor specific dimensions (metric std shown). Sizes may vary according to the motor flange chosen.

 $[\]star$ Specification subject to change without notice.

PANR Double Stage Dimensions-2



Dimensions	PANR23T	PANR34T	PANR42T	PANR56T
D1	66.67	98.425	125.73	177.8
D2	5.1	5.6	7.1	10.2
D3h6	12.7	19.05	25	25
D4 ₉₆	38.1	73.025	55.55	114.3
D5	20	35	32	-
D7	80	118	148	195
L1	60	90	115	145
L2	25.4	31.75	42	41
L3	1.6	1.7	2.4	4
L4	1	1	2	-
L5	19.05	25.4	32	32
L6	3	3	4	4
L7	10	12	19	20
L8	132.5	174.85 254.5		254.5
L11	26.5	36	40.7	40.7
C1 ²	46	70	90	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M6x1.0P
C3 ²	≦8/≦11	<u>≤</u> 14/ <u>≤</u> 19	≦19/≦24	≦19/≦24
C4 ²	33	44	57	57
C5 ² F6	30	50	70	70
C6 ²	4	4	6	6
C7 ²	42.6	60	90	90
C8 ²	18.5	20	26	26
C9 ²	88	121.4	157.7	157.7
В	3.175	4.763	8	8
Н	14.1	21.093	28	28

^{*2.} C1~C9 are motor specific dimensions (metric std shown). Sizes may vary according to the motor flange chosen.

 $[\]bigstar$ Specification subject to change without notice.



PANR Specifications

Specifi	cations		Stage	Ratio	PANR17	PANR23	PANR34	PANR42 PANR56	
				3	9	28	85	135	
				4	10	32	80	180	
				5	11	35	95	215	
				7	10	28	85	200	
			1	8	10	32	80	195	
				9	9	25	75	195	
				10	11	35	95	210	
				12	10	32	80	-	
				14	10	28	85	200	
				15	11	35	95	-	
				16	8	23	75	195	
Nominal Out	put Torque T _{2N}	N∙m	Stage	Ratio	PANR17	PANR23 PANR23T	PANR34 PANR34T	PANR42T PANR56T	
				20	11	35/31	95/95	215	
				25	11	35/30	95/95	215	
				30	11	35/30	95/95	215	
				35	11	35/28	95/95	215	
				40	11	35/31	95/95	215	
				50	11	35/30	95/95	215	
				60	11	35/30	95/95	215	
			2	70	11	35/28	95/95	215	
				80	11	35/27	95/92	215	
				100	8	35/27	95/82	205	
				120	11	35/27	95/92	215	
				160	-	23/23	75/75	195	
				200	8	21/21	65/65	180	
				243	8	23/23	75/75	195	
				300	8	21/21	65/65	180	
Emergency St	op Torque T _{2NOT}	N•m		(2.5 times of Nominal Output Torque) (*Max. Output Torque T₂в=60% of Emergency Stop Torque)					
Nominal Inp	out Speed n _{1N}	rpm	1,2	3-300	4500	4000	3000	2500	
Max. Input Speed n _{1max}		rpm	1,2	3-300	7500	7000	6000	5000	
Standard Backlash P2		arcmin	1	3-16	<u>≤</u> 18	≤ 15	<u>≤</u> 13	≦ 11	
Staridara	Bucklusti i Z	ur Ciriiiri	2	20-300	<u>≤</u> 20	<u>≤</u> 17	≦ 15	<u>≤</u> 13	
Torsiona	al Rigidity	N•m /arcmin	1,2	3-300	1.2	3.5	8.5	17	
Max. Radi	al Load F _{2rB} 1	N	1,2	3-300	580	890	2050	4370	
	I Load F _{2aB} ¹	N	1,2	3-300	410	430	1100	2630	
	ng Temp.	°C	1,2	3-300	-10°C ~ +90°C				
Servi	ce Life	hr	1,2	3-300		20,000(10,000 Cont	inuous Operation)		
			1	3-16	İ	≥ 95	•		
Effic	iency	%	2			≥ 90			
				20-300	1.0			100/105	
We	eight	kg	1	3-16	1.0	2.4	6.1	12.2/12.5	
			2	20-300	1.2	2.9/2.7	8.1/6.5	13.8/14.1	
Mountin	g Position		1,2	3-300		Any Dir			
Noise	Level ²	dBA/1m	1,2	3-300	66	68	70	73	
Protect	Protection Class		1,2	3-300		IP6	 55		
Lubrication		-	1,2	3-300		Synthetic			
Eddition		1,2	3 300	Inertia (J1)	- Symanetic				
Stage Ratio			unit	PANR17(φ8)	PANR23(φ14)	PANR34(φ19)	PANR42(φ24) PANR56(φ24)		
1 3, 4, 5		3, 4, 5, 7			0.07	0.40	2.00	2.7	
Other Ra		atios			0.05	0.30	1.50	2.2	
Stage Ratio		0	kg•cm²		PANR17(φ8)	PANR23(φ14) PANR23T(φ8)	PANR34(φ19) PANR34T(φ19)	PANR42T(φ19) PANR56T(φ19)	
2 20, 25, Other Ra		35			0.07	0.40/0.07	2.0/0.40	2.0	
					0.05	0.30/0.05	1.5/0.30	1.5	
		1.00			0.05	0.50/0.05	1.5/0.50	1	

^{* 1.} Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

^{* 2.} Measured at 3000 rpm with no load. These values are measured by gearbox with ratio = 10 (1-stage) or ratio = 100 (2-stage) at nominal input speed or 3000 rpm (if nominal input speed is higher than 3000 rpm) with no load.

* The above figures/specifications are subject to change without prior notice.

PBC

The PBC Economy Series features cylindrical mount housing, solid performance in sizes 50, 70 and 90 mm, in three stages with ratios from 3:1 through 729:1. Maximum ratio 1000:1 by demand.

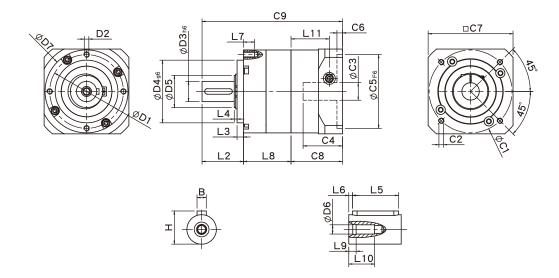


Frame Size (mm)	50, 70, 90
Ratio	3:1-729:1
Nominal Input Speed (rpm)	3,000 - 4,000
Max Input Speed (rpm)	6,000 - 8,000
Backlash (arc-min)	1 Stage : 7-9 2 Stages : 9-12 3 Stages: 12 - 15
Noise Level (dBA / 1m)	62 - 67

Features

- ► In-line Configuration.
- ▶ Output shaft, 12 mm through 22 mm diameter.
- ► Torque Capacity Range: 4.8 Nm through 58.6 Nm.
- ► Cantilevered Planet Carrier: with primary planet gear set.
- ► High performance, efficiencies and low acoustics.
- ▶ Wide Range of Ratios: 6 single stage ratios, 8 two stage ratios and 8 three stage ratios.
- Dutput Bearings deliver radial load capacity as high as 1700 N, and axial capacities up to 735 N.
- Square Servo and Step Motor input: accommodates 40 mm through 100 mm, with optional sizes available.

PBC Single Stage Dimensions



Specifications

Unit:mm

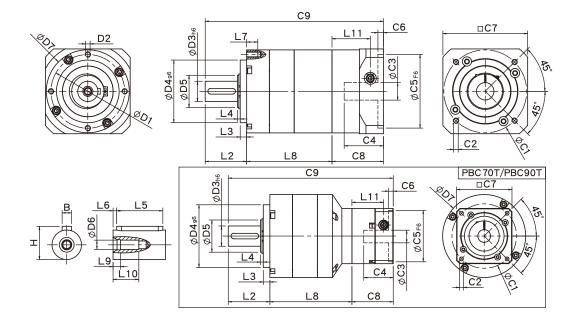
Dimensions	PBC50	PBC70	PBC90
D1	44	62	80
D2	M4x0.7P	M5x0.8P	M6x1.0P
D3h6	12	16	22
D4 ₉₆	35	52	68
D5	15	20	35
D6	M4x0.7P	M5x0.8P	M8x1.25P
D7	50	70	90
L2	26	36	45
L3	5.5	5	7
L4	2.6	2.7	3
L5	15	25	30
L6	2	2	3
L7	8	10	12
L8	32.4	49.6	54.4
L9	4	4	4.5
L10	14	16.5	20.5
L11	26.9	34.3	41.55
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	≦8/≦11	≦14/≦19	≦19/≦24/≦28
C4 ²	26.5	33.5	41
C5 ² F6	30	50	70
C6 ²	4	4	6
C7 ²	42.6	60	92
C8 ²	36.4	44.8	55.8
C9 ²	94.8	130.4	155.2
В	4	5	6
Н	13.5	18	24.5

 $[\]bigstar \ \text{C1}{\sim}\text{C9} \ \text{are motor specific dimensions (metric std shown)}. \ \text{Size may vary according to motor flange}.$

 $[\]bigstar$ Specification subject to change without notice.



PBC Double Stage Dimensions

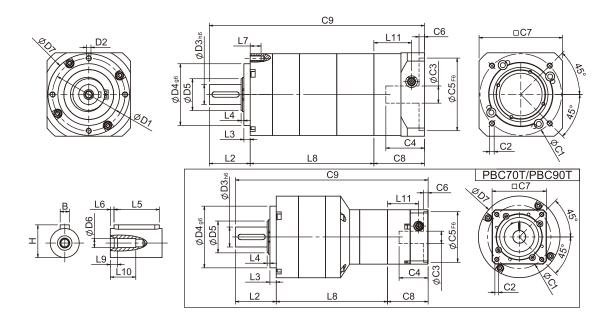


Dimensions	PBC50	PBC70	PBC70T	PBC90	PBC90T
D1	44	62		80	
D2	M4x0.7P	M5:	(0.8P	M6x	1.0P
D3 _{h6}	12	1	L6	2	2
D4 _{g6}	35		52	6	8
D5	15	2	20	3	5
D6	M4x0.7P	M5:	k0.8P	M8x1	L.25P
D7	50	7	70	9	0
L2	26	3	36	4	5
L3	5.5		5	7	
L4	2.6	2	2.7	3	3
L5	15		25	3	0
L6	2		2	3	3
L7	8	1	10		2
L8	57.3	80.3	75.9	95.4	92
L9	4		4	4.5	
L10	14	10	6.5	20.5	
L11	26.9	34.3	26.9	41.55	34.3
C1 ²	46	70	46	90	70
C2 ²	M4x0.7P	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P
C3 ²	≦8/≦11	≦14/≦19	≦8/≦11	≦19/≦24/≦28	<u>≤</u> 14/ <u>≤</u> 19
C4 ²	26.5	33.5	26.5	41	33.5
C5 ² F6	30	50	30	70	50
C6 ²	4	4	4	6	4
C7 ²	42.6	60	42.6	92	60
C8 ²	36.4	44.8	36.4	55.8	44.8
C9 ²	119.7	161.1	148.3	196.2	181.8
В	4	5		(5
Н	13.5	1	L8	24	1.5

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

[★] Specification subject to change without notice.

PBC Triple Stage Dimensions



Specifications

Unit:mm

Dimensions	PBC50	PBC70T	PBC90T
D1	44	62	80
D2	M4x0.7P	M5x0.8P	M6x1.0P
D3h6	12	16	22
D4 ₉₆	35	52	68
D5	15	20	35
D6	M4x0.7P	M5x0.8P	M8x1.25P
D7	50	70	90
L2	26	36	45
L3	5.5	5	7
L4	2.6	2.7	3
L5	15	25	30
L6	2	2	3
L7	8	10	12
L8	82.2	100.8	122.7
L9	4	4	4.5
L10	14	16.5	20.5
L11	26.9	26.9	34.3
C1 ²	46	46	70
C2 ²	M4x0.7P	M5x0.7P	M5x0.8P
C3 ²	≦8/≦11	≦8/≦11	<i>≦</i> 14/ <i>≦</i> 19
C4 ²	26.5	26.5	33.5
C5 ² F6	30	30	50
C6 ²	4	4	4
C7 ²	42.6	42.6	60
C8 ²	36.4	36.4	44.8
C9 ²	144.6	173.2	212.5
В	4	5	6
Н	13.5	18	24.5

 $[\]star$ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]bigstar$ Specification subject to change without notice.



PBC Specifications

Specifications		Stage	Ratio	PBC50	PBC70	PBC90
			3	4.8	13.6	33.5
			4	6.3	21.6	58.6
		1 1	5	6.0	20.5	55.1
			7	5.6	19.2	51.8
			9	5.4	18.5	50.0
			10	5.4	17.0	48.0
		Stage	Ratio	PBC50	PBC70(T)	PBC90(T)
			15	4.8	13.6	33.5
			20	6.3	21.6	58.6
			25	6.0	20.5	55.1
Nominal Output Torque T _{2N}	N• m	2	35	6.0	20.5	55.1
I ZN			45	6.0	20.5	55.1
			49	5.6	19.2	51.8
			63	5.6	19.2	51.8
			81	5.4	18.5	50.0
		Stage	Ratio	PBC50	PBC70(T)	PBC90(T)
			125	6.0	20.5	55.1
			175	6.0	20.5	55.1
			225	6.0	20.5	55.1
		3	245	6.0	20.5	55.1
		3	315	6.0	20.5	55.1
			405	6.0	20.5	55.1
			567	5.6	19.2	51.8
			729	5.4	18.5	50.0
Emergency Stop Torque T _{2NOT}	N• m			(3.0 times of Nax. Output Torque	Nominal Output Tor T _{2B} =60% of Emerge	
Nominal Input Speed n _{1N}	rpm	1,2,3	3-729	4000	4000	3000
Max. Input Speed n _{1max}	rpm	1,2,3	3-729	8000	8000	6000
		1	3-10	<u>≤</u> 9	≦8	≦ 7
Backlash	arcmin	2 3	15-81	≦ 12	≦ 10	≦9
		3	125-729	≦ 15	≦12	≦ 12
Torsional Rigidity	N•m /arcmin	1,2,3	3-729	0.8	2.0	7.0
Max. Radial Load F _{2rB} ¹	N	1,2,3	3-729	540	1040	1700
Max. Axial Load F _{2aB} ¹	N	1,2,3	3-729	360	720	735
Operating Temp.	°C	1,2,3	3-729		-10°C ~ +90°C	
Service Life	hr	1,2,3	3-729	20,000	(10,000 Continuous	Operation)
Efficiency	%	1 2 3	3-10 15-81 125-729		≥ 95% ≥ 90% ≥ 85%	
Weight	kg	1 2 3	3-10 15-81 125-729	0.5 0.7 0.9	1.2 1.7/1.5 2.0/1.8	3.1 4.7/3.6 5.3/4.0
Mounting Position	-	1,2,3	3-729		Any Direction	
Noise Level ²	dBA/1m	1,2,3	3-729	<u>≤</u> 62	<u>≤</u> 64	≦ 67
Protection Class	-	1,2,3	3-729		IP64	
Lubrication	-	1,2,3	3-729		Synthetic Lubricant	t
*1 Applied to the quitarit shoft contex at 100 years						

^{* 1.} Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio =

^{* 3.} The inertia value of input shaft is same as that of the PAE series. XThe above figures/specifications are subject to change without prior notice.

PBE

The PBE Primary Series square mounting flange, cantilevered primary class planetary gears, in an in-line housing through sizes 90. Offers a light torque capacity, quiet operation with backlash as low as <7 arc-min. Maximum ratio 729:1, and 1000:1 available by demand.

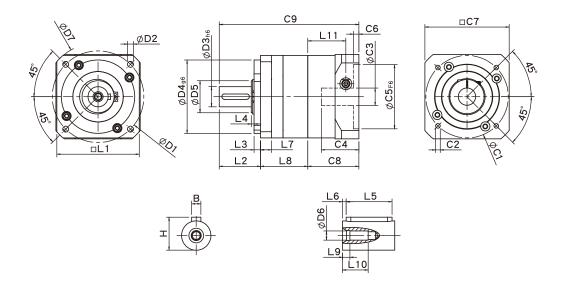


Frame Size (mm)	50, 70, 90
Ratio	3:1-729:1
Nominal Input Speed (rpm)	3,000 - 4,000
Max Input Speed (rpm)	6,000 - 8,000
Backlash (arc-min)	1 Stage : 7 - 9 2 Stages: 9 - 12 3 Stages : 12 - 15
Noise Level (dBA / 1m)	62 - 67

Features

- ► In-line Configuration.
- ▶ Output shaft, 13 mm through 22 mm diameter.
- ► Torque Capacity Range: 4.8 Nm through 58.6 Nm.
- ► Cantilevered Planet Carrier: with primary planet gear set.
- ► High performance, efficiencies and low acoustics.
- ▶ Wide Range of Ratios: 6 single stage ratios, 8 two stage ratios and 8 three stage ratios.
- ▶ Output Bearings deliver radial load capacity as high as 1700 N, and axial capacities up to 735 N.
- ➤ Square Servo and Step Motor input: accommodates 40 mm through 100 mm, with optional sizes available.

PBE Single Stage Dimensions



Specifications

Unit:mm

Dimensions	PBE42	PBE60	PBE90
D1	50	70	100
D2	3.4	5.5	6.5
D3h6	13	16	22
D4 _{g6}	35	50	80
D5	15	20	35
D6	M4x0.7P	M5x0.8P	M8x1.25P
D7	56	80	118
L1	42.6 (44) ¹	60	90
L2	26	36	45
L3	5.5	5	7
L4	2.6	2.7	3
L5	15	25	30
L6	2	2	3
L7	8	10	12
L8	32.4	49.6	54.4
L9	4	4	4.5
L10	14	16.5	20.5
L11	26.9	34.3	41.5
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	≦8/≦11	<u>≤</u> 14/ <u>≤</u> 19	≦19/≦24/≦28
C4 ²	26.5	33.5	41
C5 ² F6	30	50	70
C6 ²	4	4	6
C7 ²	42.6	60	92
C8 ²	36.4	44.8	55.8
C9 ²	94.8	130.4	155.2
В	4	5	6
Н	15	18	24.5

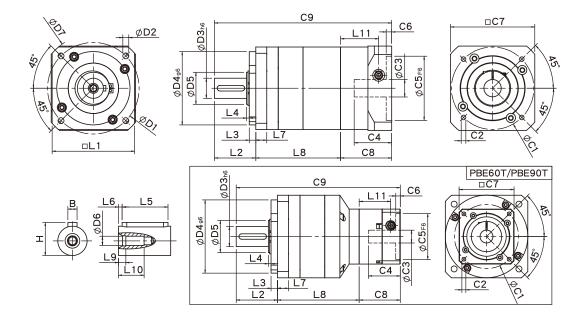
 $[\]star$ L1=44 when gear ratio is 10.

 $[\]bigstar$ Specification subject to change without notice.



 $[\]bigstar \ \text{C1}{\sim}\text{C9} \ \text{are motor specific dimensions (metric std shown)}. \ \text{Size may vary according to motor flange}.$

PBE Double Stage Dimensions

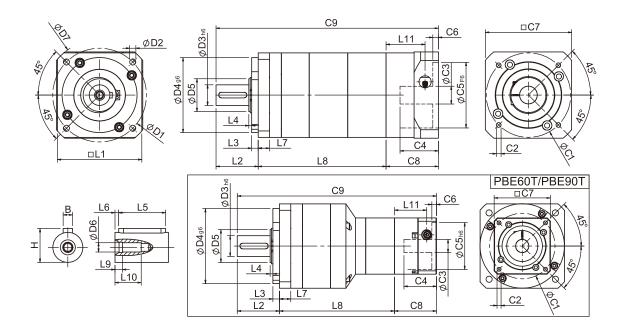


Dimensions	PBE42	PBE60/	PBE60T	PBE90/	PBE90T
D1	50	7	0	10	00
D2	3.4	5	.5	6.5	
D3h6	13	1	.6	2	22
D4 _{g6}	35	5	0	8	30
D5	15	2	0	3	5
D6	M4x0.7P	M5×	0.8P	M8x	1.25P
D7	56	8	80	1	18
L1	42.6	6	0	g	00
L2	26	3	6	4	! 5
L3	5.5		5		7
L4	2.6	2	.7	3	
L5	15	2	!5	30	
L6	2	:	2	3	
L7	8	1	.0	12	
L8	57.3	80.3	75.9	95.4	92
L9	4	4	4	4.5	
L10	14	16	5.5	20.5	
L11	26.9	34.3	26.9	41.55	34.3
C1 ²	46	70	46	90	70
C2 ²	M4x0.7P	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P
C3 ²	≦8/≦11	<i>≦</i> 14/ <i>≦</i> 19	≦8/≦11	≦19/≦24/≦28	<i>≦</i> 14/ <i>≦</i> 19
C4 ²	26.5	33.5	26.5	41	33.5
C5 ² F6	30	50	30	70	50
C6 ²	4	4	4	6	4
C72	42.6	60	42.6	92	60
C8 ²	36.4	44.8	36.4	55.8	44.8
C9 ²	119.7	161.1	148.3	196.2	181.8
В	5		5		6
Н	15	1	.8	24	4.5

 $[\]star$ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]star$ Specification subject to change without notice.

PBE Triple Stage Dimensions



Specifications

Unit:mm

Dimensions	PBE42	PBE60T	PBE90T
D1	50	70	100
D2	3.4	5.5	6.5
D3h6	13	16	22
D4 _{g6}	35	50	80
D5	15	20	35
D6	M4x0.7P	M5x0.8P	M8x1.25P
D7	56	80	118
L1	42.6	60	90
L2	26	36	45
L3	5.5	5	7
L4	2.6	2.7	3
L5	15	25	30
L6	2	2	3
L7	8	10	12
L8	82.2	100.8	122.7
L9	4	4	4.5
L10	14	16.5	20.5
L11	26.9	26.9	34.3
C1 ²	46	46	70
C2 ²	M4x0.7P	M4x0.7P	M5x0.8P
C3 ²	≦8/≦11	≦8/≦11	<u>≤</u> 14/ <u>≤</u> 19
C4 ²	26.5	26.5	33.5
C5 ² F6	30	30	50
C6 ²	4	4	4
C7 ²	42.6	42.6	60
C8 ²	36.4	36.4	44.8
C9 ²	144.6	173.2	212.5
В	5	5	6
Н	15	18	24.5

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

[★] Specification subject to change without notice.



PBE Specifications

Specifications		Stage	Ratio	PBE42	PBE60	PBE90
			3	4.8	13.6	33.5
			4	6.3	21.6	58.6
		1	5	6.0	20.5	55.1
			7	5.6	19.2	51.8
			9	5.4	18.5	50.0
			10	5.4	17.0	48.0
		Stage	Ratio	PBE42	PBE60(T)	PBE90(T)
			15	4.8	13.6	33.5
			20	6.3	21.6	58.6
			25	6.0	20.5	55.1
Nominal Output Torque T _{2N}	N∙m	2	35	6.0	20.5	55.1
2N			45	6.0	20.5	55.1
			49	5.6	19.2	51.8
			63	5.6	19.2	51.8
			81	5.4	18.5	50.0
		Stage	Ratio	PBE42	PBE60(T)	PBE90(T)
			125	6.0	20.5	55.1
			175	6.0	20.5	55.1
			225	6.0	20.5	55.1
		3	245	6.0	20.5	55.1
			315	6.0	20.5	55.1
			405	6.0	20.5	55.1
			567	5.6	19.2	51.8
			729	5.4	18.5	50.0
			723		ominal Output Torque)	
Emergency Stop Torque T _{2NOT}	N∙m		(*Ma	ax. Output Torque T_{2B}	=60% of Emergency St	op Torque)
Nominal Input Speed n _{1N}	rpm	1,2,3	3-729	4000	4000	3000
Max. Input Speed n _{1max}	rpm	1,2,3	3-729	8000	8000	6000
		1	3-10	<u>≤</u> 9	≦8	<u>≤</u> 7
Backlash	arcmin	2	15-81	<u>_</u> 12	≤ 10	<u>≤</u> 9
		3	125-729	<i>≦</i> 15	<i>≦</i> 12	<i>≦</i> 12
Torsional Rigidity	N•m /arcmin	1,2,3	3-729	0.8	2.0	7.0
Max. Radial Load F _{2rB} ¹	N	1,2,3	3-729	540	1040	1700
Max. Axial Load F _{2aB} ¹	N	1,2,3	3-729	360	720	735
Operating Temp.	°C		3-729		-10°C ~ +90°C	
Service Life	hr		3-729	20,000 (10,000 Continuous Op	eration)
		1	3-10		≥ 95%	
Efficiency	%	2	15-81		≥ 90%	
		3	125-729		≧ 85%	
Weight		1	3-10	0.5	1.2	3.1
	kg	2	15-81	0.7	1.7/1.5	4.7/3.6
	I	3	125-729	0.9	2.0/1.8	5.3/4.0
Mounting Pasition		100	2 722			
Mounting Position	-	1,2,3	3-729		Any Direction	
Noise Level ²	- dBA/1m	1,2,3	3-729	<u>≤</u> 62	<u>≤</u> 64	≦ 67
-				<u>≤</u> 62		≦ 67

^{* 1.} Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.



^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio = 100 (2-stage).

XThe above figures/specifications are subject to change without prior notice.

PEC

PEC series of economy Planetary Gearheads provide stable performance, a wide range of sizes up to 235 mm, in round flange and round housing, available ratios 3:1 to 100:1. High output torque and quiet operation with standard backlash 7-15 arc-min.

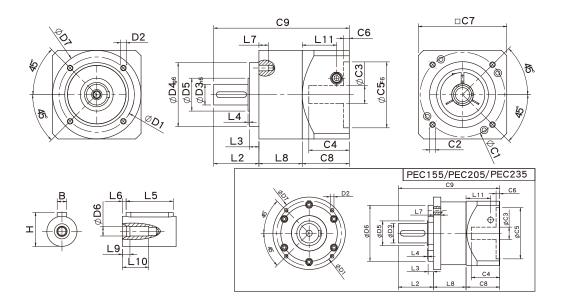


Frame Size (mm)	50, 70, 90, 120, 155, 205, 235
Ratio	3:1-100:1
Nominal Input Speed (rpm)	2,000 - 3,000
Max Input Speed (rpm)	4,000 - 6,000
Backlash (arc-min)	1 Stage : 7 - 12 2 Stages : 9 - 15
Noise Level (dBA / 1m)	65 - 80

Features

- ▶ In-line configuration with output shaft 13 mm through 75 mm diameter
- ➤ Torque capacity range: 10 Nm through 1670 Nm
- ► Solid performance, high efficiencies and low acoustics
- ➤ Wide range of ratios up to 100:1
- ▶ Output bearings deliver radial load capacity as high as 11120 N, and axial capacities up to 8560 N
- ➤ Service life lubricant

PEC Single Stage Dimensions



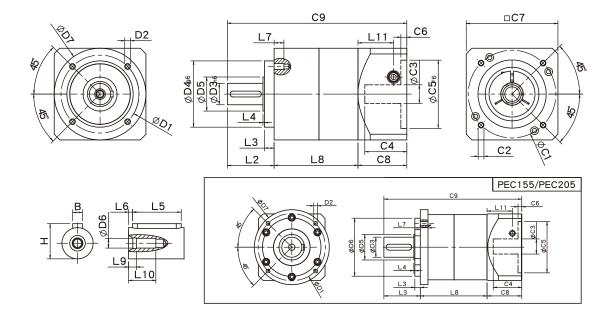
Dimensions	PEC50	PEC70	PEC90	PEC120	PEC155	PEC205	PEC235
D1	44	62	80	108	140	184	210
D2	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M10x1.5P	M12x1.75P	M16x2.0P
D3 _{h6}	12	16	22	32	40	55	75
D4 _{g6}	35	52	68	90	120	160	180
D5	15	25	35	45	50	70	90
D6	M4x0.7P	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	50	70	94	120	155	205	235
L2	24.5	35	48	60	93	99.5	126
L3	4	5	10	6	8	15	18
L4	1.5	1.5	1.5	3	6	2.5	3
L5	15	25	32	40	60	70	90
L6	2	2	3	5	5	6	7
L7	8	10	10	16	18	21	32
L8	30	38	46	61	79	92.5	129.5
L9	4	4	4.5	6	6	8	7
L10	14	16.5	20.2	30	38	48	42
L11	24.4	31.5	36.5	42	63	69.5	102.2
C1 ²	46	70	90	115	145	200	235
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P	M12x1.75P
C3 ²	<u>≦</u> 8	≦14	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 28	<u>≦</u> 35	<u>≤</u> 50	<u>≤</u> 55
C4 ²	27	35	43	58	66	82	98
C5 ² _{F6}	30	50	70	95	110	114.3	200
C6 ²	4	5	5	8	6	13	12
C7 ²	50	70	94	120	140	182	220
C8 ²	34	44	50	63	80	95	130
C9 ²	88.5	117	144	184	252	287	385.5
В	5	5	6	10	12	16	20
Н	15	18	24.5	35	43	59	79.5

 $[\]bigstar \ \text{C1}{\sim}\text{C9} \ \text{are motor specific dimensions} (\text{metric std shown}), \text{Size may vary according to the motor flange chosen}.$

[★] Specification subject to change without notice.



PEC Double Stage Dimensions-1

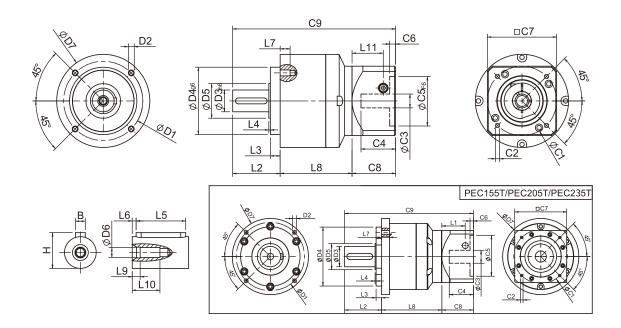


Dimensions	PEC50	PEC70	PEC90	PEC120	PEC155	PEC205
D1	44	62	80	108	140	184
D2	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M10x1.5P	M12x1.75P
D3 h6	12	16	22	32	40	55
D4 _{g6}	35	52	68	90	120	160
D5	15	25	35	45	50	70
D6	M4x0.7P	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P
D7	50	70	94	120	155	205
L2	24.5	35	48	60	93	99.5
L3	4	5	10	6	8	15
L4	1.5	1.5	1.5	3	6	2.5
L5	15	25	32	40	60	70
L6	2	2	3	5	5	6
L7	8	10	10	15	18	21
L8	56	66	86	109	140	182.5
L9	4	4	4.5	6	6	8
L10	14	16.5	20.5	30	38	48
L11	24.4	31.5	36.5	42	63	69.5
C1 ²	46	70	90	115	145	200
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C32	≦8	<u>≤</u> 14	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 28	<u>≤</u> 35	<u>≤</u> 50
C42	27	35	43	58	66	82
C5 ² _{F6}	30	50	70	95	110	114.3
C6 ²	4	5	5	8	6	13
C72	50	70	94	120	140	182
C8 ²	34	44	50	63	80	95
C92	114.5	145	184	232	313	377
В	5	5	6	10	12	16
Н	15	18	24.5	35	43	59

[★] C1~C9 are motor specific dimensions(metric std shown),Size may vary according to the motor flange chosen.

 $[\]star$ Specification subject to change without notice.

PEC Double Stage Dimensions-2



Dimensions	PEC70T	PEC90T	PEC120T	PEC155T	PEC205T	PEC235T
D1	62	80	108	140	184	210
D2	M5x0.8P	M6x1.0P	M8x1.25P	M10x1.5P	M12x1.75P	M16x2.0P
D3 _{h6}	16	22	32	40	55	75
D4 _{g6}	52	68	90	120	160	180
D5	25	35	45	50	70	90
D6	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	70	94	120	155	205	235
L2	35	48	60	93	99.5	126
L3	5	10	6	8	15	18
L4	1.5	1.5	3	6	2.5	3
L5	25	32	40	60	70	90
L6	2	3	5	5	6	7
L7	10	10	15	18	21	32
L8	60.8	72.5	99.4	127	162	211.5
L9	4	4.5	6	6	8	7
L10	16.5	20.5	30	38	48	42
L11	29	35.5	40.5	42	63	69.5
C1 ²	46	70	90	115	145	200
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C32	<u>≦</u> 8	<u>≤</u> 14	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 28	<u>≤</u> 35	<u>≤</u> 50
C42	28.5	41	47.75	58	66	82
C52 F6	30	50	70	95	110	114.3
C62	5.5	8	6	8	6	13
C72	50	70	94	120	140	182
C8 ²	40	50	55	63	80	95
C92	135.8	170.5	214.4	283	341.5	432.5
В	5	6	10	12	16	20
Н	18	24.5	35	43	59	79.5

 $[\]bigstar \ \text{C1}{\sim}\text{C9} \ \text{are motor specific dimensions} (\text{metric std shown}), \text{Size may vary according to the motor flange chosen}.$

[★] Specification subject to change without notice.



PEC Specifications

Specific	cations		Stage	Ratio	PEC-50	PEC-70	PEC-90	PEC-120	PEC-155	PEC-205	PEC-235
				3	13.8	44.2	95.2	283	482	1151	1670
				4	11.9	35.9	74.6	249	490	1055	1574
			1	5	13.8	43.0	95.2	283	473	1151	1670
				7	11.9	36.0	85.6	219	400	1055	1574
				10	10.1	25.0	75.0	210	320	763	1184
			Stage	Ratio	PEC-50	PEC-70(T)	PEC-90(T)	PEC-120(T)	PEC-155(T)	PEC-205(T)	PEC-235T
				15	13.8	44.2	95.2	283	482	1151	1670
Nominal Output Tor	rque T _{2N}	N • m		20	11.9	35.9	74.6	249	490	1055	1574
				25	13.8	43.0	95.2	283	473	1151	1670
				30	13.8	43.0	95.2	283	473	1151	1670
			_	35	13.8	43.0	95.2	283	473	1151	1670
			2	40	13.8	43.0	95.2	283	473	1151	1670
				50	13.8	43.0	95.2	283	473	1151	1670
				70	11.9	36.0	85.6	219	400	1055	1574
				100	10.1	25.0	75.0	210	320	763	1184
Emergency Stop Torq	Jue T _{2NOT}	N • m			3.0 Times of Nominal Output Torque) (* Max. Output Torque T2B =60% of Nominal Output Torque)						
Nominal Input Spee	ed n _{1N}	rpm	1,2	3-100	3000	3000	3000	2500	2000	2000	2000
Max. Input Spee	ed n _{1max}	rpm	1,2	3-100	6000	6000	6000	5000	4000	4000	4000
Standard Backlas	sh P2	arcmin	1 2	3-10 12-100	≦12 ≦15	≦9 ≦12	≦9 ≦12	≦7 ≤9	≦7 ≤9	≦7 ≤9	≦7 ≦9
Torsional Rigio	Torsional Rigidity N • m		1,2	3-100	1.0	2.8	7.5	15.5	30	57	110
Max. Radial Loa	d F _{2rB} ¹	N	1,2	3-100	350	960	1630	3380	6150	7260	11120
Max. Axial Load	d F _{2aB} ¹	N	1,2	3-100	320	900	1420	2930	5510	5550	8560
Operating Ter	np.	°C		3-100	-10°C ~ +90°C						
Service Life		hr		3-100		20,0		Continuous (
ECC - 1		%	1	3-10				≥ 95%	•		
Efficiency		/0	2	12-100				≥ 90%			
Weight		kg	1	3-10	0.7	1.4	3.0	7.3	15.6	26	56
		9	2	12-100	0.9	2.2/1.7	5.0/3.4	11.5/8.5	20.7/17.2	36/31	62
Mounting Posi		-	1,2	3-100		1		ny Direction			
Noise Level		dBA/1m	1,2	3-100	≦65	≦67	≦70	≦70	≦75	≦75	≦80
Protection Cla		-	1,2	3-100				IP65			
Lubrication		-	1,2	3-100			Ur	ea Derivative	es		
					Inert	ia(J1)					
Stage	R	Ratio	ur	nit	PEC-50	PEC-70	PEC-90	PEC-120	PEC-155	PEC-205	PEC-235
		3			0.03	0.20	0.81	2.20	7.89	25.2	77.9
		4			0.03	0.16	0.65	1.80	5.83	19.8	56.5
1		5 7			0.03	0.15	0.62	1.61	5.38	18.3	53.3
		10		2	0.03	0.14	0.60	1.55	5.22	17.8	53.0 52.9
		Ratio	Kg ∙	cm²	0.03	0.14	0.60	1.53	5.20	17.6	
Stage					PEC-50	PEC-70(T) 0.15(0.02)	PEC-90(T)	PEC-120(T)	PEC-155(T)	PEC-205(T)	PEC-235T
, -		<u>/20/25</u> /35/40			0.02	0.15(0.02)	0.62(0.15)	1.61(0.62) 1.55(0.60)	5.38(1.61) 5.22(1.55)	18.3(5.38) 17.8(5.22)	18.3 17.8
2		/35/40 70/100			0.02		0.60(0.14)	1.53(0.60)	5.22(1.53)	17.8(5.22)	17.8
*1 Applied to the out		· ·	rnm		0.02	0.1 (0.02)	J.JJ(U.1-1)	1.55(0.00)	3.20(1.33)	17.0(3.20)	17.0

* 1. Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.



^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio = 100 (2-stage). *The above figures/specifications are subject to change without prior notice.

PEE

PEE series of economy Planetary Gearheads provide stable performance, a wide range of sizes up to 220 mm, in square flange and round housing, available ratios 3:1 to 100:1. High output torque and quiet operation with standard backlash 7-15 arc-min.

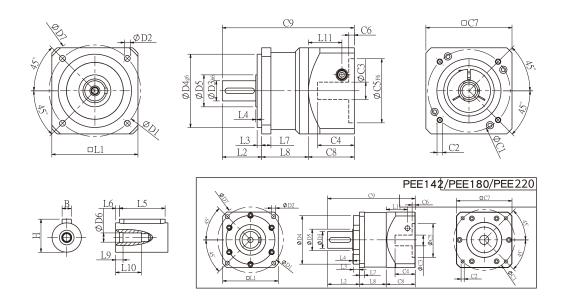


Frame Size (mm)	50, 70, 90, 120, 142, 180, 220
Ratio	3:1-100:1
Nominal Input Speed (rpm)	2,000 - 3,000
Max Input Speed (rpm)	4,000 - 6,000
Backlash (arc-min)	1 Stage : 7 - 12 2 Stages : 9 - 15
Noise Level (dBA / 1m)	65 - 80

Features

- ▶ In-line configuration with output shaft 13 mm through 75 mm diameter.
- ➤ Torque capacity range: 10 Nm through 1670 Nm.
- ➤ Solid performance, high efficiencies and low acoustics.
- ➤ Wide range of ratios up to 100:1.
- ▶ Output bearings deliver radial load capacity as high as 11120 N, and axial capacities up to 8560 N.
- ► Service life lubricant.

PEE Single Stage Dimensions



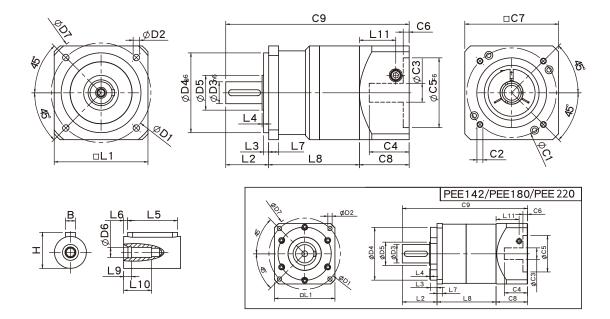
Dimensions	PEE50	PEE70	PEE90	PEE120	PEE142	PEE180	PEE220
D1	50	70	100	130	165	215	250
D2	3.4	6	6.5	8.5	10.5	13	17
D3h6	13	16	22	32	40	55	75
D4g6	35	50	80	110	130	160	180
D5	15	25	35	45	50	70	90
D6	M4x0.7P	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	64	90	120	152	186	239	292
L1	50	70	94	120	142	182	220
L2	24.5	37	43	60	93	104.5	138
L3	4	7	5	6	8	20	30
L4	1.5	1.5	1.5	3	6	2.5	3
L5	15	25	32	40	60	70	90
L6	2	2	3	5	5	6	7
L7	5	6	10	12	18	16	20
L8	30	36	51	61	79	87.5	117.5
L9	4	4	4.5	6	6	8	7
L10	14	16.5	20.5	30	38	48	42
L11	24.4	31.5	36.5	42	63	69.5	102.2
C1 ²	46	70	90	115	145	200	235
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P	M12x1.75P
C3 ²	≦8	≦14	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 28	≦35	≦50	≦55
C4 ²	27	35	43	58	66	82	98
C5 ² F6	30	50	70	95	110	114.3	200
C6 ²	4	5	5	8	6	13	12
C7 ²	50	70	94	120	140	182	220
C8 ²	34	44	50	63	80	95	130
C9 ²	88.5	117	144	184	252	287	385.5
В	5	5	6	10	12	16	20
Н	15	18	24.5	35	43	59	79.5

[★] C1~C9 are motor specific dimensions(metric std shown),Size may vary according to the motor flange chosen.

 $[\]star$ Specification subject to change without notice.



PEE Double Stage Dimensions-1



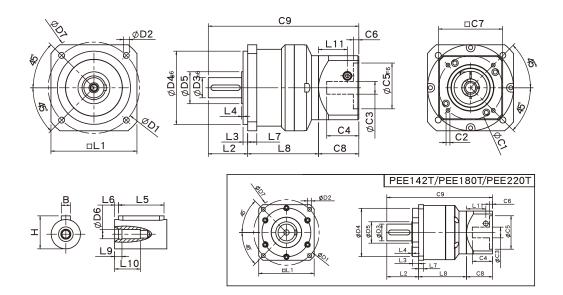
Unit:mm **Specifications**

Dimensions	PEE50	PEE70	PEE90	PEE120	PEE142	PEE180	PEE220
D1	50	70	100	130	165	215	250
D2	3.4	6	6.5	8.5	10.5	13	17
D3h6	13	16	22	32	40	55	75
D4g6	35	50	80	110	130	160	180
D5	15	25	35	45	50	70	90
D6	M4x0.7P	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	64	90	120	152	186	239	292
L1	50	70	94	120	142	182	220
L2	24.5	37	43	60	93	104.5	138
L3	4	7	5	6	8	20	30
L4	1.5	1.5	1.5	3	6	2.5	3
L5	15	25	32	40	60	70	90
L6	2	2	3	5	5	6	7
L7	5	6	10	12	18	16	20
L8	56	64	91	109	140	177.5	232
L9	4	4	4.5	6	6	8	7
L10	14	16.5	20.2	30	38	48	42
L11	24.4	31.5	36.5	42	63	69.5	102.2
C1 ²	46	70	90	115	145	200	235
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P	M12x1.75P
C3 ²	≦8	≦14	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 28	≦35	≦50	≦55
C4 ²	27	35	43	58	66	82	98
C5 ² F6	30	50	70	95	110	114.3	200
C6 ²	4	5	5	8	6	13	12
C7 ²	50	70	94	120	140	182	220
C8 ²	38.5	46	55	63	80	95	130
C92	119	147	189	232	313	377	500
В	5	5	6	10	12	16	20
Н	15	18	24.5	35	43	59	79.5

[★] C1~C9 are motor specific dimensions(metric std shown),Size may vary according to the motor flange chosen.

 $[\]star$ Specification subject to change without notice.

PEE Double Stage Dimensions-2



Dimensions	PEE70T	PEE90T	PEE120T	PEE142T	PEE180T	PEE220T
D1	70	100	130	165	215	250
D2	6	6.5	8.5	10.5	13	17
D3 _{h6}	16	22	32	40	55	75
D4g6	50	80	110	130	160	180
D5	25	35	45	50	70	90
D6	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	90	120	152	186	239	292
L1	70	94	120	142	182	220
L2	37	43	60	93	104.5	138
L3	7	5	6	8	20	30
L4	1.5	1.5	3	6	2.5	3
L5	25	32	40	60	70	90
L6	2	3	5	5	6	7
L7	6	10	12	18	16	20
L8	58.8	77.5	99.4	127	157	199.5
L9	4	4.5	6	6	8	7
L10	16.5	20.5	30	38	48	42
L11	29	35.5	40.5	42	63	69.5
C12	66.67	70	90	115	145	200
C22	M5x0.8P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 ²	≦8	<u>≤</u> 14	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 28	<u>≤</u> 35	<u>≤</u> 50
C4 ²	27	41	47.75	58	66	82
C5 ² F6	38.1	50	70	95	110	114.3
C6 ²	4	8	6	8	6	13
C7 ²	60	70	94	120	140	182
C8 ²	38.5	50	55	63	80	95
C9 ²	134.3	170.5	214.4	283	341.5	432.5
В	5	6	10	12	16	20
Н	18	24.5	35	43	59	79.5

 $[\]star$ C1~C9 are motor specific dimensions(metric std shown), Size may vary according to the motor flange chosen.

 $[\]star$ Specification subject to change without notice.



Specifications	5	Stage	Ratio	PEE-50	PEE-70	PEE-90	PEE-120	PEE-142	PEE-180	PEE-220
			3	13.8	44.2	95.2	283	482	1151	1670
			4	11.9	35.9	74.6	249	490	1055	1574
		1	5	13.8	43.0	95.2	283	473	1151	1670
			7	11.9	36.0	85.6	219	400	1055	1574
			10	10.1	25.0	75.0	210	320	763	1184
		Stage	Ratio	PEE-50	PEE-70(T)	PEE-90(T)	PEE-120(T)	PEE-142(T)	PEE-180(T)	PEE-220(T)
Name in al Outroot Tanana T			15	13.8	44.2	95.2	283	482	1151	1670
Nominal Output Torque T _{2N}	N • m		20	11.9	35.9	74.6	249	490	1055	1574
			25	13.8	43.0	95.2	283	473	1151	1670
			30	13.8	43.0	95.2	283	473	1151	1670
		2	35	13.8	43.0	95.2	283	473	1151	1670
		-	40	13.8	43.0	95.2	283	473	1151	1670
			50	13.8	43.0	95.2	283	473	1151	1670
			70	11.9	36.0	85.6	219	400	1055	1574
			100	10.1	25.0	75.0	210	320	763	1184
Emergency Stop Torque T _{2NO}	т N • m			(3.0 t imes of Nominal Output Torque) (*Max. Output Torque T_{2B} = 60% of Emergency Stop Torque)						
Nominal Input Speed n _{1N}	rpm	1,2	3-100	3000	3000	3000	2500	2000	2000	2000
Max. Input Speed n _{1ma}	, rpm	1,2	3-100	6000	6000	6000	5000	4000	4000	4000
Standard Backlash P2	arcmin	1 2	3-10 12-100	≦12 ≦15	≦9 ≦12	≦9 ≦12	≦7 ≦9	≦7 ≦9	≦9 ≦9	≦7 ≦9
Torsional Rigidity	N • m /arcmin	1,2	3-100	1.0	2.8	7.5	15.5	30	57	110
Max. Radial Load F _{2rB} 1	N	1,2	3-100	350	960	1630	3380	6150	7260	11120
Max. Axial Load F _{2aB} ¹	N	1,2	3-100	320	900	1420	2930	5510	5550	8560
Operating Temp.	°C		3-100			-1	L0°C ~ +90°C	<u> </u>		
Service Life	hr		3-100		20,0	000 (10,000	Continuous	Operation)		
Efficiency	%	1 2	3-10 12-100				≥ 95% ≥ 90%			
Weight	kg	1	3-10	0.7	1.4	3.0	7.3	15.6	26	56
	Ng Ng	2	12-100	0.9	2.2/1.7	5.0/3.4	11.5/8.5	20.7/17.2	36/31	80/62
Mounting Position	-	1,2	3-100		I		ny Direction			
Noise Level ²	dBA/1m	1,2	3-100	≦65	≦67	≦70	≦70	≦75	≦75	≦80
Protection Class	-	1,2	3-100				IP65			
Lubrication	-	1,2	3-100			Ur	ea Derivative	es		
CI	D. 1'		•,		ia(J1)	DEE 00	DEE 100	DEE 4.40	DEE 100	DEE 222
Stage	Ratio	ui	nit	PEE-50	PEE-70	PEE-90	PEE-120	PEE-142	PEE-180	PEE-220
	3 4	-		0.03 0.03	0.20 0.16	0.81 0.65	2.20 1.80	7.89 5.83	25.2 19.8	77.9 56.5
1	4	1		0.03	0.15	0.62	1.61	5.38	18.3	53.3
1	7	1		0.03	0.13	0.60	1.55	5.22	17.8	53.0
	10	Ka.	cm ²	0.03	0.14	0.60	1.53	5.20	17.6	52.9
Stage	Ratio		CITI	PEE-50	PEE-70(T)	PEE-90(T)	PEE-120(T)	PEE-142(T)	PEE-180(T)	PEE-220(T)
	5/20/25	1		0.02	0.15(0.02)		1.61(0.62)	5.38(1.61)	18.3(5.38)	53.9(18.3)
2 3	0/35/40 0/70/100			0.02 0.02	0.14(0.02)	0.60(0.14)	1.55(0.60) 1.53(0.60)	5.22(1.55) 5.20(1.53)	17.8(5.22) 17.6(5.20)	53.0(17.8) 52.9(17.6)

^{1.} Applied to the output shaft center at 400 rpm. 2. Measured at 3000 rpm with no load.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

^{*}The above figures/specifications are subject to change without prior notice.

PGC

This precision type planetary gear reducer is offering 3 precision levels and 7 frame sizes to choose. They are ready for most industry and general servo motor motion control applications. Round mounting flange, caged precision class spur planetary gears in an in-line housing through sizes 235 mm. High torque capacity, quiet operation with backlash as low as < 3 arc-min. Ratios 3:1 to 100:1.

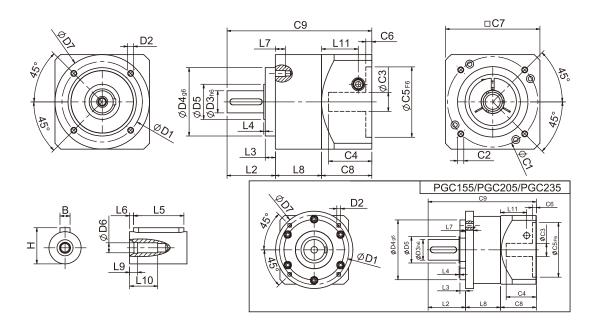


Frame Size (mm)	50, 70, 90, 120, 155, 205, 235
Ratio	3:1-100:1
Nominal Input Speed (rpm)	2,000 - 3,000
Max Input Speed (rpm)	4,000 - 6,000
Backlash (arc-min)	1 Stage : 3 - 12 2 Stages : 5 - 15
Noise Level (dBA / 1m)	60 - 75

Features

- ▶ In-line configuration with output shaft 13 mm through 75 mm diameter.
- ► Torque capacity range: 10 Nm through 1670 Nm.
- ► Caged planet carrier: with precision planet gear set.
- ► High performance, efficiencies and low acoustics.
- ▶ Wide range of ratios: 5 single stage ratios and up to 9 two-stage ratios.
- ▶ Output bearings deliver radial load capacity as high as 13500 N, and axial capacities up to 7300N.
- ➤ Square servo and step motor input: accommodates 50 mm through 235 mm, with optional sizes available.
- ➤ Service life lubricant.

PGC Single Stage Dimensions



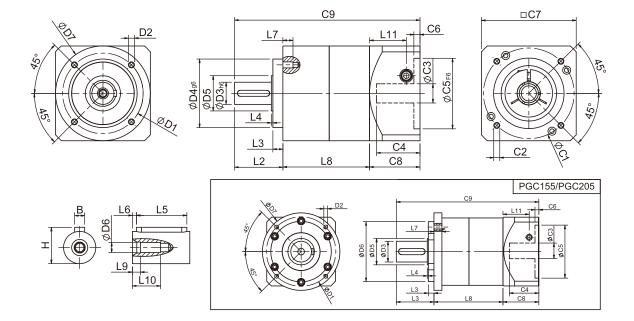
Dimensions	PGC50	PGC70	PGC90	PGC120	PGC155	PGC205	PGC235
D1	44	62	80	108	140	184	210
D2	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M10x1.5P	M12x1.75P	M16x2.0P
D3h6	12	16	22	32	40	55	75
D4g6	35	52	68	90	120	160	180
D5	15	25	35	45	50	70	90
D6	M4x0.7P	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	50	70	94	120	155	205	235
L2	24.5	35	48	60	93	99.5	126
L3	4	5	10	6	8	15	18
L4	1.5	1.5	1.5	3	6	2.5	3
L5	15	25	32	40	60	70	90
L6	2	2	3	5	5	6	7
L7	8	10	10	15	18	21	32
L8	30	38	46	61	79	92.5	129.5
L9	4	4	4.5	6	6	8	7
L10	14	16.5	20.5	30	38	48	42
L11	24.4	31.5	36.5	42	63	69.5	102.2
C1 ²	46	70	90	115	145	200	235
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P	M12x1.75P
C3 ²	≦8	≦14	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 28	<u>≤</u> 35	<u>≤</u> 50	<u>≤</u> 55
C4 ²	27	35	43	58	66	82	98
C5 ² _{F6}	30	50	70	95	110	114.3	200
C6 ²	4	5	5	8	6	13	12
C7 ²	50	70	94	120	140	182	220
C82	38.5	46	55	63	80	95	130
C92	93	119	149	184	252	287	385.5
В	5	5	6	10	12	16	20
Н	15	18	24.5	35	43	59	79.5

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]bigstar$ Specification subject to change without notice.



PGC Double Stage Dimensions-1

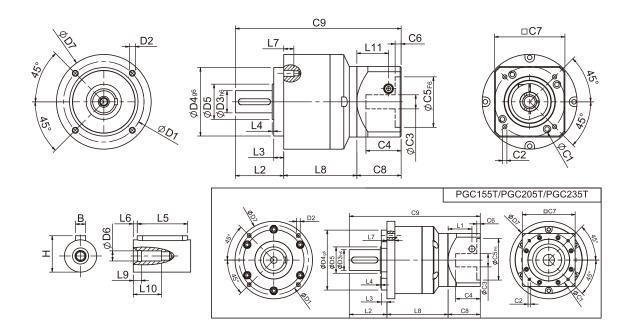


Dimensions	DCCEO	DC 670	DC COO	DCC120	DCC155	DCC30F
	PGC50	PGC70	PGC90	PGC120	PGC155	PGC205
D1	44	62	80	108	140	184
D2	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M10x1.5P	M12x1.75P
D3 h6	12	16	22	32	40	55
D4 _{g6}	35	52	68	90	120	160
D5	15	25	35	45	50	70
D6	M4x0.7P	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P
D7	50	70	94	120	155	205
L2	24.5	35	48	60	93	99.5
L3	4	5	10	6	8	15
L4	1.5	1.5	1.5	3	6	2.5
L5	15	25	32	40	60	70
L6	2	2	3	5	5	6
L7	8	10	10	15	18	21
L8	56	66	86	109	140	182.5
L9	4	4	4.5	6	6	8
L10	14	16.5	20.5	30	38	48
L11	24.4	31.5	36.5	42	63	69.5
C1 ²	46	70	90	115	145	200
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 ²	≦8	<u>≦</u> 14	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 28	<u>≤</u> 35	<u>≤</u> 50
C42	27	35	43	58	66	82
C5 ² _{F6}	30	50	70	95	110	114.3
C6 ²	4	5	5	8	6	13
C72	50	70	94	120	140	182
C8 ²	34	44	50	63	80	95
C92	114.5	145	184	232	313	377
В	5	5	6	10	12	16
Н	15	18	24.5	35	43	59

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

[★] Specification subject to change without notice.

PGC Double Stage Dimensions-2



Dimensions	PGC70T	PGC90T	PGC120T	PGC155T	PGC205T	PGC235T
D1	62	80	108	140	184	210
D2	M5x0.8P	M6x1.0P	M8x1.25P	M10x1.5P	M12x1.75P	M16x2.0P
D3h6	16	22	32	40	55	75
D4 _{g6}	52	68	90	120	160	180
D5	25	35	45	50	70	90
D6	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	70	94	120	155	205	235
L2	35	48	60	93	99.5	126
L3	5	10	6	8	15	18
L4	1.5	1.5	3	6	2.5	3
L5	25	32	40	60	70	90
L6	2	3	5	5	6	7
L7	10	10	15	18	21	32
L8	60.8	72.5	99.4	127	162	211.5
L9	4	4.5	6	6	8	7
L10	16.5	20.5	30	38	48	42
L11	29	35.5	40.5	42	63	69.5
C12	46	70	90	115	145	200
C22	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C32	≦8	≦14	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 28	<u>≤</u> 35	<u>≤</u> 50
C42	28.5	41	47.75	58	66	82
C52 _{F6}	30	50	70	95	110	114.3
C62	5.5	8	6	8	6	13
C72	50	70	94	120	140	182
C82	40	50	55	63	80	95
C92	135.8	170.5	214.4	283	341.5	432.5
В	5	6	10	12	16	20
Н	18	24.5	35	43	59	79.5

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]star$ Specification subject to change without notice.



PGC Specifications

Specifica	ations		Stage	Ratio	PGC-50	PGC-70	PGC-90	PGC-120	PGC-155	PGC-205	PGC-235
				3	13.8	44.2	95.2	283	482	1151	1670
				4	11.9	35.9	74.6	249	490	1055	1574
			1	5	13.8	43.0	95.2	283	473	1151	1670
				7	11.9	36.0	85.6	219	400	1055	1574
				10	10.1	25.0	75.0	210	320	763	1184
			Stage	Ratio	PGC-50	PGC-70(T)	PGC-90(T) I	PGC-120(T)	PGC-155(T))PGC-205(T)PGC-235T
				15	13.8	44.2	95.2	283	482	1151	1670
Nominal Output Torque	T _{2N}	N·m		20	11.9	35.9	74.6	249	490	1055	1574
				25	13.8	43.0	95.2	283	473	1151	1670
			2	30	13.8	43.0	95.2	283	473	1151	1670
			2	35	13.8	43.0	95.2	283	473	1151	1670
				40	13.8	43.0	95.2	283	473	1151	1670
				50	13.8	43.0	95.2	283	473	1151	1670
				70	11.9	36.0	85.6	219	400	1055	1574
				100	10.1	25.0	75.0	210	320	763	1184
Emergency Stop Torque	T _{2NOT}	N·m			(*	*Max. Outp	(3.0 t imes ut Torque T	of Nominal 2B =60% of	Output Tord Emergency	que) Stop Torque	e)
Nominal Input Speed	l n _{in}	rpm	1,2	3-100	3000	3000	3000	2500	2000	2000	2000
Max. Input Speed n ₁	max	rpm	1,2	3-100	6000	6000	6000	5000	4000	4000	4000
Micro Backlash P	0 6	arcmin	1 2	3-10 12-100	-	-	- -	≦3 ≦5	≦3 ≦5	≦3 ≦5	≦3 ≦5
Precision Backlash	P1 a	arcmin	1 2	3-10 12-100	-	≦ 6 ≤ 9	≦ 6 ≦ 9	≦5 ≦7	≦5 ≦7	≦5 ≦7	≦5 ≦7
Circle I De III e I Do			1	3-10	≦12	<u>= 9</u> ≤ 9	<u>=</u> 9	<u>=</u> 7 ≦7	=, ≦7	<u>=</u> 7 ≦7	<u>=′</u> <u>≦</u> 7
Standard Backlash		arcmin	2	12-100	≦15	≦12	≦12	<u>≦</u> 9	<u>≦</u> 9	<u>≦</u> 9	<u>≦</u> 9
Torsional Rigidity	' /	N · m arcmin	1,2	3-100	1.0	2.8	7.5	15.5	30	57	110
Max. Radial Load F		N	1,2	3-100	450	1200	2050	4250	7680	9080	13500
Max. Axial Load F		N	1,2	3-100	320	900	1420	2930	4680	5100	7300
Operating Temp		°C		3-100				0°C ~ +90°			
Service Life		hr	1	3-100 3-10			20,000 (10,0	000 Continu	ous operati	on)	
Efficiency		%	2	12-100				≧96% ≧92%			
\\/ - : - t			1	3-10	0.7	1.4	3.0	7.3	15.6	26	56
Weight		kg	2	12-100	0.9	2.2(1.7)	5.0(3.4)	11.5(8.5)	20.7(17.2)	36(31)	62
Mounting Position		-	1,2	3-100				ny Direction			
Noise Level ²		dBA/1m	1,2	3-100	60	62	65	65	70	70	75
Protection Class		-	1,2	3-100				IP65			
Lubrication		-	1,2	3-100				thetic Lubric	ant		
Ctor	Б.:			•,		Inertia (J1)					
Stage	Rati	0	ur	liτ	PGC-50	PGC-70	PGC-90	PGC-120	PGC-155	PGC-205	PGC-235
_	3 4				0.03	0.20 0.16	0.81 0.65	2.20 1.80	7.89 5.83	25.2 19.8	77.9 56.5
1 5 7					0.02	0.15	0.62	1.61	5.38	18.3	53.3
					0.02	0.14	0.60	1.55	5.22	17.8	53.0
1			Kg⋅	cm ²	0.02	0.14	0.60	1.53	5.20	17.6	52.9
Stage	Rati	0	9		PGC-50	PGC-70(T)	PGC-90(T)	PGC-120(T)	PGC-155(T)	PGC-205(T)	PGC-235T
	15/20,				0.02	0.15(0.02)		1.61(0.62)			18.3
2	30/35,				0.02	0.14(0.02)		1.55(0.60)			17.8
* 1. Applied to the output	50/70/				0.02	0.14(0.02)	0.60(0.14)	1.53(0.60)	5.20(1.53)	17.6(5.20)	17.6

^{* 1.} Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.



^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio = 100 (2-stage). *The above figures/specifications are subject to change without prior notice.

PGCH

Sesame Motor PGCH in-line planetary gearheads provide integration between superior operating performance and cost effectiveness. One-piece planet carrier/output shaft and newly designed gear profile benefit higher output torque, precision, loading capacity and lower noise level. High quality gears and components are utilized to create compact and rigid unit with low backlash and maintenance-free operation. 3 levels of precision are available with max frame size 235 mm. Adapters for all servo motors.



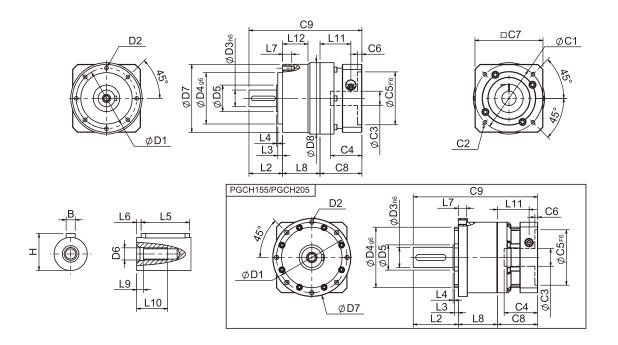


Frame Size (mm)	50, 70, 90, 120, 155, 205, 235
Ratio	3:1-100:1
Nominal Input Speed (rpm)	2,000 - 5,000
Max Input Speed (rpm)	3,500 - 10,000
Backlash (arc-min)	1 Stage : 3 - 8 2 Stages : 5 - 10
Noise Level (dBA / 1m)	58 - 70

Features

- ▶ One-piece planet carrier/output shaft, high torsional rigidity and loading capacity.
- ▶ One-piece compact ring gear design, high precision and output torque.
- ► Alloy steel precision gears, low backlash, low noise, high wear resistance.
- ► Lubricated for life and IP65 sealing, maintenance free.
- ► Adapters for all servo motors.

PGCH Single Stage Dimensions



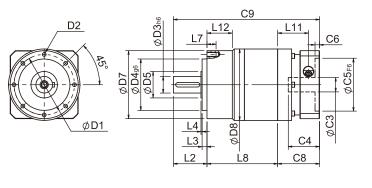
Dimensions	PGCH50	PGCH70	PGCH90	PGCH120	PGCH155	PGCH205	PGCH235
D1	44	62	80	108	140	184	210
D2	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M10x1.5P	M12x1.75P	M16x2.0P
D3 _{h6}	12	16	22	32	40	55	75
D4 g6	35	52	68	90	120	160	180
D5	15	25	35	45	50	70	114.5
D6	M4x0.7P	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	50	70	90	120	155	205	235
D8	50	70	94.5	120	-	-	253
L2	24.5	36	44.5	60	89.5	96.5	126
L3	4	6	6.5	7	8	12	18
L4	1	1.5	1.5	3.5	2.5	2.5	3
L5	15	25	32	40	60	70	90
L6	2	2	3	5	5	6	7
L7	8	10	12	16	16	20	28
L8	29.8	38	49.5	60	77.5	98	124
L9	4	4	4.5	6	6	8	15
L10	12	16.5	20.5	30	38	48	42
L11	29	35.4	40.7	53.7	63	69.5	95
L12	-	-	33.5	-	-	-	70
C1 ²	46	70	90	115	145	200	235
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P	M12x1.75P
C3 ²	<u>≤</u> 8/ <u>≤</u> 11	<i>≦</i> 14/ <i>≦</i> 19	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 32/ <u>≤</u> 38	<u>≤</u> 35/ <u>≤</u> 38	<u>≤</u> 50	<u>≤</u> 55
C4 ²	26.5	37.6	41.4	51.3	66.5	77	112
C5 ² _{F6}	30	50	70	95	110	114.3	200
C6 ²	4.1	4.5	6	6	5.5	6	6
C7 ²	42	60	90	115	140	180	220
C8 ²	38.1	46.5	55.4	70	80	90	120
C9 ²	92.4	120.5	149.4	190	247	284.5	370
В	5	5	6	10	12	16	20
Н	13.5	18	24.5	35	43	59	79.5

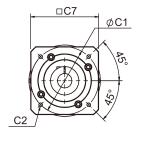
 $[\]bigstar \ \text{C1$\sim$C9$ are motor specific dimensions (metric std shown). Size may vary according to motor flange.}$

 $[\]bigstar$ Specification subject to change without notice.

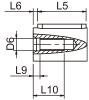


PGCH Double Stage Dimensions-1







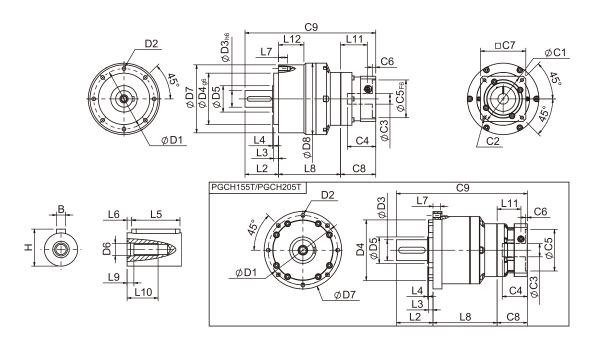


Dimensions	PGCH50	PGCH70	PGCH90		
D1	44	62	80		
D2	M4x0.7P	M5x0.8P	M6x1.0P		
D3 _{h6}	12	16	22		
D4g6	35	52	68		
D5	15	25	35		
D6	M4x0.7P	M5x0.8P	M8x1.25P		
D7	50	70	90		
D8	50	70	94.5		
L2	24.5	36	44.5		
L3	4	6	6.5		
L4	1	1.5	1.5		
L5	15	25	32		
L6	2	2	3		
L7	8	10	12		
L8	56.8	71	93.5		
L9	4	4	4.5		
L10	12	16.5	20.5		
L11	29	35.4	40.7		
L12	-	-	33.5		
C12	46	70	90		
C2 2	M4x0.7P	M5x0.8P	M6x1.0P		
C32	≦8/≦11	≦14/≦19	≦19/≦24		
C4 ²	26.5	37.6	41.4		
C5 ² _{F6}	30	50	70		
C62	4.1	4.5	6		
C72	42	60	90		
C8 ²	38.1	46.5	55.4		
C9 ²	119.4	153.5	193.4		
В	5	5	6		
Н	13.5	18	24.5		

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]bigstar$ Specification subject to change without notice.

PGCH Double Stage Dimensions-2



Dimensions	PGCH70T	PGCH90T	PGCH120T	PGCH155T	PGCH205T	PGCH235T
D1	62	80	108	140	184	210
D2	M5x0.8P	M6x1.0P	M8x1.25P	M10x1.5P	M12x1.75P	M16x2.0P
D3h6	16	22	32	40	55	75
D4 _{g6}	52	68	90	120	160	180
D5	25	35	45	50	70	114.5
D6	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	70	90	120	155	205	235
D8	70	94.5	120	-	-	253
L2	36	44.5	60	89.5	96.5	126
L3	6	6.5	7	8	12	18
L4	1.5	1.5	3.5	2.5	2.5	3
L5	25	32	40	60	70	90
L6	2	3	5	5	6	7
L7	10	12	16	16	20	28
L8	66.5	82	102.5	129.5	170	215
L9	4	4.5	6	6	8	15
L10	16.5	20.5	30	38	48	42
L11	29	35.4	40.7	53.7	63	68.9
L12	-	33.5	-	-	-	70
C1 ²	46	70	90	115	145	200
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 ²	≦8/≦11	≦14/≦19	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 32/ <u>≤</u> 38	≦35/≦38	<u>≤</u> 50
C4 ²	26.5	37.6	41.4	51.3	66.5	77
C5 ² F6	30	50	70	95	110	114.3
C6 ²	4.1	4.5	6	6	5.5	6
C72	42	60	90	115	140	180
C8 ²	38.1	46.5	55.4	70	80	90
C92	140.6	173	217.9	289	346.5	431
В	5	6	10	12	16	20
Н	18	24.5	35	43	59	79.5

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

[★] Specification subject to change without notice.



PGCH Specifications

Specification	ıs	Stage	Ratio	PGCH-50	PGCH-70	PGCH-90	PGCH-120	PGCH-155	PGCH-205	PGCH-235
			3	19	53	145	290	520	950	1100
			4	20	55	150	300	550	1000	1700
			5	17	54	140	330	600	1050	2000
		1	6	15	46	135	310	560	1000	1900
		1	7	14	44	125	300	530	900	1800
			8	12	41	110	260	480	900	1600
			9	11	37	95	230	430	800	1500
			10	11	37	95	230	430	800	1500
		Stage	Ratio	PGCH-50	PGCH-70 PGCH-70T	PGCH-90 PGCH-90T	PGCH-120T			
Nominal Output Torque T	N•m		15	19	53	145	290	520	950	2000
i i			20	20	55	150	300	550	1000	2000 2000
			25	17	54	140	330	600	1050	2000
			30 35	17 17	54 54	140 140	330 330	600 600	1050 1050	2000
			40	17	54	140	330	600	1050	2000
		2	45	17	54	140	330	600	1050	2000
		2	50	17	54	140	330	600	1050	2000
			60	15	46	135	310	560	1000	2000
			70	14	44	125	300	530	960	1900
			80	12	41	110	260	480	900	1800
			90	11	37	95	230	430	800	1600
			100	11	37	95	230	430	800	1500
Emergency Stop Torque T ₂₁	N·m		100			(3.0 times of N	Nominal Outp	ut Torque)		1300
Nominal Input Speed n	n rpm	1,2	3-100	5000	4000	4000	4000	3000	2500	2000
Max. Input Speed n _{1ma}	rpm	1,2	3-100	10000	8000	8000	8000	5000	4000	3500
!! !		1	3-10	<u>≤</u> 4	<u>≤</u> 4	≤ 4	≦3	≦3	<u>≦</u> 3	≤3
Micro Backlash P0	arcmin	2	12-100	≦6	≦6	≦6	 ≦5	<u>_</u> ≦5	 ≦5	<u>_</u> 5
		1	3-10	 ≦6	 ≦6	<u>=</u> 6	 ≦5	 ≦5	 ≦5	<u>=</u> ≦5
Precision Backlash P1	arcmin	2	12-100	<u>≡</u> € 8	= - ≤ 8	= 5 ≤ 8	<u>=</u> - <u>≤</u> 7	== <u>≤</u> 7	<u>=</u> - <u>≤</u> 7	<u>= -</u> ≦7
Standard Backlash P2		1	3-10	<u>≅</u> 8	≦8	<u></u> <u>≤</u> 8	<u>=</u> ′ ≦7	<u>=</u> 7 ≦7	<u>=</u> ′ ≦7	<u>= 7</u> ≦7
Staridard backlasiri 2	arcmin	2	12-100	<u>=</u> 0 ≦10	<u></u> <u></u> <u></u> <u> </u> <u> </u>	<u>≅</u> 0 <u>≦</u> 10	<u>≡</u> ′ ≦9	<u>=</u> 7 ≦9	<u>≡</u> ′ ≦9	<u></u>
- 1 louis	N· m									
Torsional Rigidity	/arcmin	1,2	3-100	3	7	14	25	50	145	300
Max. Radial Load F _{2rB}	· N	1,2	3-100	702	1377	2985	6100	7140	11050	28000
Max. Axial Load F _{2aB}	N	1,2	3-100	410	765	1625	3350	4670	6460	15000
Operating Temp.	°C					20.000./1	-10°C ~ +		\	
Service Life	hr	_	3-100							
Efficiency	0/.	1	3-10				≥97%			
Efficiency %		2	12-100 ≥94%							
Weight	kg	1	3-10	0.6	1.3	3.5	7.8	16.1	27	55
	, ky	2	12-100	0.9	2.0(1.6)	5.6(3.9)	8.7	19	34	67
Mounting Position -		1,2	3-100				Any Direct			
Noise Level ²	dBA/1m		3-100	58	58	60	63	65	67	70
Protection Class	-	1,2	3-100				IP65			
Lubrication	-	1,2	3-100			S	ynthetic Lub	ricant		
Inertia (J1)										
Stage R	atio		unit	PGCH-50	PGCH-70	PGCH-90	PGCH-120		PGCH-205	
	3			0.03	0.23	0.97	2.35	10.00	30.50	79.50
	4			0.02	0.18	0.67	1.66	7.17	25.86	58.21
1	5	8		0.02	0.17	0.65	1.50	6.52	23.63	54.36
6,	7/8			0.02	0.14	0.60	1.45	6.17	22.92	54.12
9/10		K	g · cm ²	0.02	0.14	0.58	1.41	6.10	22.73	53.98
			5 5111	PGCH-50			PGCH-120(T)			
	20/25	-		0.02	0.17(0.02)	0.65(0.15)	0.65	1.50	6.25	30.50
20/	35/40	00		0.02	0.14(0.02)	0.60(0.14)	0.60	1.45	6.17	22.92
				0.02	0.14(0.02)	0.58(0.14)	0.58	1.41	6.10	22.73
45/50/60/70/80/				0.02	0.1 (0.02)	J.JU(U.1-1)	0.50	4.14	0.10	22.13

^{* 1.} Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio = 100 (2-stage). *The above figures/specifications are subject to change without prior notice.

PGCHR

Sesame Motor PGCHR right angle planetary gear-heads provide integration between superior operating performance and cost effectiveness. One-piece planet carrier/output shaft and newly designed gear profile benefit higher output torque, precision, loading capacity and lower noise level. High quality gears and components are utilized to create compact and rigid unit with low backlash and maintenance-free operation. The highest ratio 300:1 is available with max frame size 120 mm. Adapters customized for all servo motors.

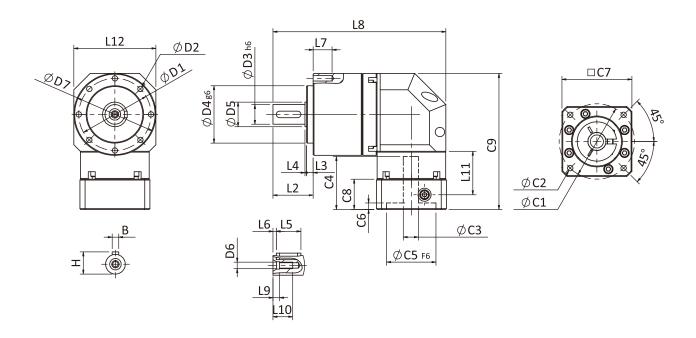


Frame Size (mm)	50, 70, 90, 120
Ratio	3:1-300:1
Nominal Input Speed (rpm)	4,000 - 5,000
Max Input Speed (rpm)	8,000 - 10,000
Backlash (arc-min)	1 Stage : 8 - 10 2 Stages : 10 - 12
Noise Level (dBA / 1m)	61 - 68

Features

- ► One-piece planet carrier/output shaft, high torsional rigidity and loading capacity.
- ► One-piece compact ring gear design, high precision and output torque.
- ► Alloy steel precision gears, low backlash, low noise, high wear resistance.
- ► Lubricated for life and IP65 sealing, maintenance free.
- ► Adapters for all servo motor.

PGCHR Single Stage Dimensions



Specifications

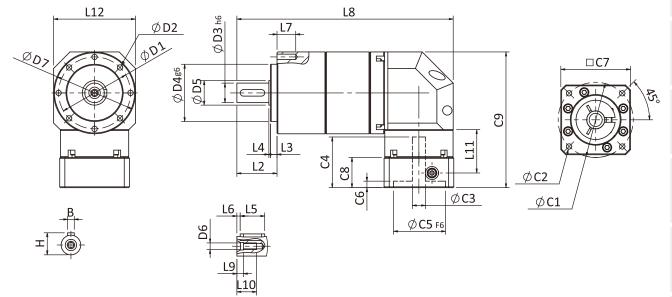
Dimensions	PGCHR50	PGCHR70	PGCHR90
D1	44	62	80
D2	M4x0.7P	M5x0.8P	M6x1.0P
D3h6	12	16	22
D4 _{g6}	35	52	68
D5	15	25	35
D6	M4x0.7P	M5x0.8P	M8x1.25P
D7	50	70	90
L2	24.5	36	44.5
L3	4	6	6.5
L4	1	1.5	1.5
L5	15	25	32
L6	2	2	3
L7	8	10	12
L8	105.3	144.3	201
L9	4	4	4.5
L10	12	16.5	20.5
L11	26.5	36	41.2
L12	50	70	98
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	≦8/≦11	<u>≤</u> 14/ <u>≤</u> 19	<u>≤</u> 19/ <u>≤</u> 24
C4 ²	33	44	57
C5 ² F6	30	50	70
C6 ²	4	4	6
C7 ²	42.6	60	90
C8 ²	18.5	20	26
C9 ²	83	111.4	149.2
В	4	5	6
Н	13.5	18	24.5

^{*2.} C1~C9 are motor specific dimensions (metric std shown). Sizes may vary according to the motor flange chosen.

[★] Specification subject to change without notice.



PGCHR Double Stage Dimensions-1



Specifications

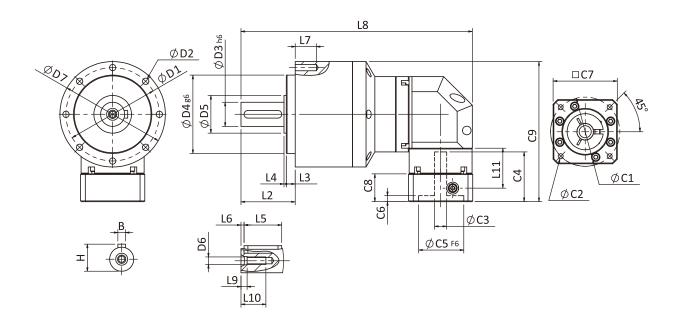
Dimensions	PGCHR50	PGCHR70	PGCHR90
D1	44	62	80
D2	M4x0.7P	M5x0.8P	M6x1.0P
D3h6	12	16	22
D4g6	35	52	68
D5	15	25	35
D6	M4x0.7P	M5x0.8P	M8x1.25P
D7	50	70	90
L2	24.5	36	44.5
L3	4	6	6.5
L4	1	1.5	1.5
L5	15	25	32
L6	2	2	3
L7	8	10	12
L8	132.3	177.3	245
L9	4	4	4.5
L10	12	16.5	20.5
L11	26.5	36	41.2
L12	50	70	98
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	≦8/≦11	≦14/≦19	≦19/≦24
C4 ²	33	44	57
C5 ² _{F6}	30	50	70
C6 ²	4	4	6
C7 ²	42.6	60	90
C8 ²	18.5	20	26
C9 ²	83	111.4	149.2
В	4	5	6
Н	13.5	18	24.5

^{*2.} C1~C9 are motor specific dimensions (metric std shown). Sizes may vary according to the motor flange chosen.



[★] Specification subject to change without notice.

PGCHR Double Stage Dimensions-2



Specifications	

Dimensions	PGCHR70T	PGCHR90T	PGCHR120T
D1	62	80	108
D2	M5x0.8P	M6x1.0P	M8x1.25P
D3h6	16	22	32
D4g6	52	68	90
D5	25	35	45
D6	M5x0.8P	M8x1.25P	M12x1.75P
D7	70	90	120
L2	36	44.5	60
L3	6	6.5	7
L4	1.5	1.5	3.5
L5	25	32	40
L6	2	3	5
L7	10	12	16
L8	153.5	196.8	269.5
L9	4	4.5	6
L10	16.5	20.5	30
L11	26.5	36	41.2
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	≦8/≦11	≦14/≦19	≦19/≦24
C4 ²	33	44	57
C52 _{F6}	30	50	70
C62	4	4	6
C7 ²	42.6	60	90
C8 ²	18.5	20	26
C92	93	123.65	160.2
В	5	6	10
Н	18	24.5	35

^{*2.} C1~C9 are motor specific dimensions (metric std shown). Sizes may vary according to the motor flange chosen.

 $[\]star$ Specification subject to change without notice.



PGCHR Specifications

Sp	pecifications		Stage	Ratio	PGCHR-50	PGCHR-70	PGCHR-90	PGCHR-120		
				3	16	36	105	135		
				4	18	48	140	180		
				5	17	54	140	225		
				7	14	44	125	300		
		1	8	18	48	140	260			
			1	9	16	35	95	230		
				10	17	50	140	210		
				12	18	40	120	-		
				14	14 17	44 45	125 135	300		
				15 20	11	37	95	230		
			Stage	Ratio	PGCHR-50	PGCHR-70/ PGCHR-70T	PGCHR-90/ PGCHR-90T	PGCHR-120T		
		NI m		20	20	55	150	300		
Nominal Ou	tput Torque T _{2N}	N·m		25	17	54	140	330		
				30	19	53	145	330		
				35	17	54	140	330		
				40	20	55	150	300		
				50	17	54	140	330		
						54				
			2	60	17		140	330		
				70	17	54	140	330		
				80	17	54	140	330		
				100	17	54	140	330		
				120	17	54	140	330		
				140	14	44	125	300		
				200	11	37	95	230		
				300	11	37	95	230		
Emergency St	op Torque T _{2NOT}	ue T _{2NOT} N·m			(2.5 t imes of Nominal Output Torque) (*Max. Output Torque T _{2B} =60% of Emergency Stop Torque)					
Nominal In	out Speed n _{in}	rpm	1,2	3-300	5000	4000	4000	4000		
Max. Inpu	ut Speed n _{1max}	rpm	1,2	3-300	10000	8000	8000	8000		
a			1	3-16	≦10	<u>≤</u> 10	<u>≦</u> 9	≦8		
Standard B	Standard Backlash P2		2	20-300	<u>≤</u> 12	≤12	≤11	<u>≤</u> 10		
Torsiona	l Rigidity	N ·m /arcmin	1,2	3-300	3	7	14	25		
Max. Radi	al Load F _{2rB} ¹	N	1,2	3-300	702	1377	2985	6100		
	I Load F _{2aB} ¹	N	1,2	3-300	410 765 1625		3350			
·	ng Temp.	°C		3-300		-10℃	~ +90℃			
Servio	ce Life	hr		3-300		20,000 (10,000 C	ontinuous Opera	ation)		
- 66			1	3-16			95%			
Effici	ency	%	2	20-300)2%			
				3-16	1 1	2.2		10.5		
Wei	ight	kg	1		1.1		6.0	10.5		
Mountin	g Position		2	20-300	1.4	2.8/2.0	8.0/5.0	12.0		
		- ID A (f	1,2	3-300			rection			
	Level ²	dBA/1m		3-300	61	63	65	68		
	on Class		1,2	3-300			65			
Lubrication -		1,2	3-300		Synthetic	Lubricant				
					Inertia (J1)					
Stage Ratio			unit	PGCHR-50 (ψ8)	PGCHR-70 (ψ14)	PGCHR-90 (ψ19)	PGCHR-120 (ψ24)			
1 3, 4, 5					0.07	0.40	2.0	2.7		
	Other R	atios			0.05	0.30	1.5	2.2		
Stage	Rati	0		⟨g · cm²	PGCHR-50 (ψ8)	PGCHR-70 (ψ14)/ PGCHR-70T (ψ8)	PGCHR-90 (ψ19)/ PGCHR-90T (ψ14)	PGCHR-120T (ψ19)		
	20, 25	, 35			0.07	0.40/0.07	2.0/0.40	2.0		
2	Other R	atios			0.05	0.30/0.05	1.5/0.30	1.5		
* 1 Applied to			00			'				

^{* 1.} Applied to the output shaft center at 100 rpm.

 $[\]star$ 2. Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio =

XThe above figures/specifications are subject to change without prior notice.

PGE

PGE precision type planetary gear reducer series are offering 3 precision levels and 7 frame sizes to choose. They are ready for most industry and general servo motor motion control applications. Square mounting flange, caged precision class spur planetary gears in an in-line housing through sizes 220mm. High torque capacity, quiet operation with backlash as low as < 3 arc-min. Ratios 3:1 to 100:1.

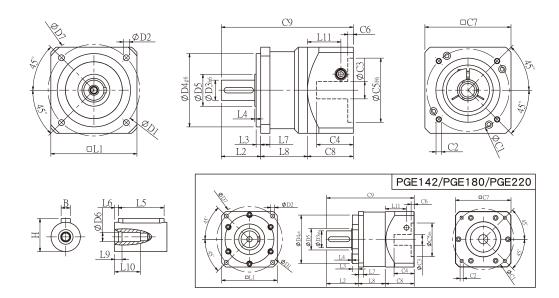


Frame Size (mm)	50, 70, 90, 120, 142, 180, 220
Ratio	3:1-100:1
Nominal Input Speed(rpm)	2,000 - 3,000
Max Input Speed(rpm)	4,000 - 6,000
Backlash(arc-min)	1 Stage : 3 - 12 2 Stages : 5 - 15
Noise Level(dBA / 1m)	60 - 75

Features

- ▶ In-line configuration with output shaft 13 mm through 75 mm diameter.
- ► Torque capacity range: 10 Nm through 1670 Nm.
- ► Caged planet carrier: with precision planet gear set.
- ➤ One-piece planet gears carrier & output shaft.
- ► High performance, efficiencies and low acoustics.
- ▶ Wide range of ratios: 5 single stage ratios and up to 9 two-stage ratios.
- ▶ Output bearings deliver radial load capacity as high as 13500 N, and axial capacities up to 7300 N.
- ➤ Square servo and step motor input: accommodates 50 mm through 220 mm, with optional sizes available.
- ➤ Service life lubricant.

PGE Single Stage Dimensions



Specifications Unit:mm

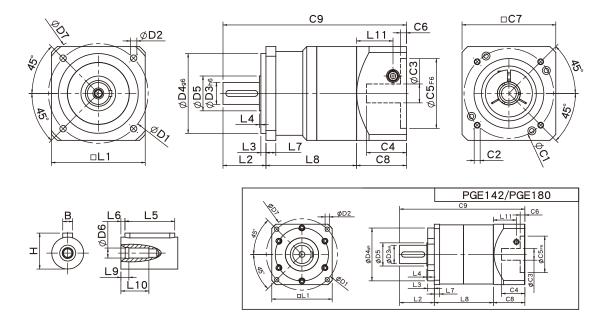
Dimensions	PGE50	PGE70	PGE90	PGE120	PGE142	PGE180	PGE220
D1	50	70	100	130	165	215	250
D2	3.4	6	6.5	8.5	10.5	13	17
D3h6	13	16	22	32	40	55	75
D4g6	35	50	80	110	130	160	180
D5	15	25	35	45	50	70	90
D6	M4x0.7P	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	64	90	120	152	186	239	292
L1	50	70	94	120	142	182	220
L2	24.5	37	43	60	93	104.5	138
L3	4	7	5	6	8	20	30
L4	1.5	1.5	1.5	3	6	2.5	3
L5	15	25	32	40	60	70	90
L6	2	2	3	5	5	6	7
L7	5	6	10	12	18	16	20
L8	30	36	51	61	79	87.5	117.5
L9	4	4	4.5	6	6	8	7
L10	14	16.5	20.2	30	38	48	42
L11	24.4	31.5	36.5	42	63	69.5	102.2
C1 ²	46	70	90	115	145	200	235
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P	M12x1.75P
C3 ²	≦8	<u>≤</u> 14	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 28	<u>≤</u> 35	<u>≤</u> 50	<u>≤</u> 55
C4 ²	27	35	43	58	66	82	98
C5 ² F6	30	50	70	95	110	114.3	200
C6 ²	4	5	5	8	6	13	12
C7 ²	50	70	94	120	140	182	220
C8 ²	38.5	46	55	63	80	95	130
C9 ²	93	119	149	184	252	287	385.5
В	5	5	6	10	12	16	20
Н	15	18	24.5	35	43	59	79.5

 $[\]star$ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]star$ Specification subject to change without notice.



PGE Double Stage Dimensions-1



Specifications Unit:mm

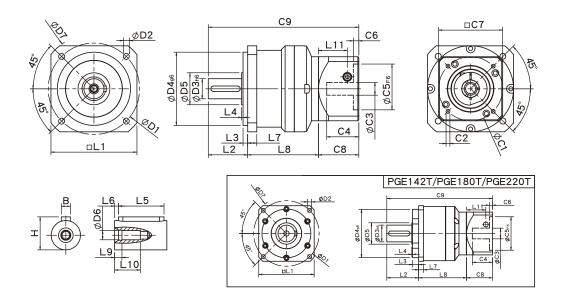
Dimensions	PGE50	PGE70	PGE90	PGE120	PGE142	PGE180
D1	50	70	100	130	165	215
D2	3.4	6	6.5	8.5	10.5	13
D3h6	13	16	22	32	40	55
D4g6	35	50	80	110	130	160
D5	15	25	35	45	50	70
D6	M4x0.7P	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P
D7	64	90	120	152	186	239
L1	50	70	94	120	142	182
L2	24.5	37	43	60	93	104.5
L3	4	7	5	6	8	20
L4	1.5	1.5	1.5	3	6	2.5
L5	15	25	32	40	60	70
L6	2	2	3	5	5	6
L7	5	6	10	12	18	16
L8	56	64	91	109	140	177.5
L9	4	4	4.5	6	6	8
L10	14	16.5	20.2	30	38	48
L11	24.4	31.5	36.5	42	63	69.5
C1 ²	46	70	90	115	145	200
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 ²	≦8	≦14	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 28	<u>≤</u> 35	<u>≤</u> 50
C4 ²	27	35	43	58	66	82
C5 ² _{F6}	30	50	70	95	110	114.3
C6 ²	4	5	5	8	6	13
C7 ²	50	70	94	120	140	182
C8 ²	38.5	46	55	63	80	95
C9 ²	119	147	189	232	313	377
В	5	5	6	10	12	16
Н	15	18	24.5	35	43	59

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.



[★] Specification subject to change without notice.

PGE Double Stage Dimensions-2



Specifications Unit:mm

Dimensions	PGE70T	PGE90T	PGE120T	PGE142T	PGE180T	PGE220T
D1	70	100	130	165	215	250
D2	6	6.5	8.5	10.5	13	17
D3 h6	16	22	32	40	55	75
D4 g6	50	80	110	130	160	180
D5	25	35	45	50	70	90
D6	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	90	120	152	186	239	292
L1	70	94	120	142	182	220
L2	37	43	60	93	104.5	138
L3	7	5	6	8	20	30
L4	1.5	1.5	3	6	2.5	3
L5	25	32	40	60	70	90
L6	2	3	5	5	6	7
L7	6	10	12	18	16	20
L8	58.8	77.5	99.4	127	157	199.5
L9	4	4.5	6	6	8	7
L10	16.5	20.5	30	38	48	42
L11	29	35.5	40.5	42	63	69.5
C12	66.67	70	90	115	145	200
C2 2	M5x0.8P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 ²	≦8	≦14	<i>≦</i> 19/ <i>≦</i> 24	<u>≤</u> 24/ <u>≤</u> 28	<u>≤</u> 35	<u>≤</u> 50
C4 ²	27	41	47.75	58	66	82
C5 ² _{F6}	38.1	50	70	95	110	114.3
C6 ²	4	8	6	8	6	13
C7 ²	60	70	94	120	140	182
C8 ²	38.5	50	55	63	80	95
C9 ²	134.3	170.5	214.4	283	341.5	432.5
В	5	6	10	12	16	20
Н	18	24.5	35	43	59	79.5

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]star$ Specification subject to change without notice.



PGE Specifications

Specifica	tions		Stage	Ratio	PGE-50	PGE-70	PGE-90	PGE-120	PGE-142	PGE-180	PGE-220
				3	13.8	44.2	95.2	283	482	1151	1670
				4	11.9	35.9	74.6	249	490	1055	1574
		1	5	13.8	43.0	95.2	283	473	1151	1670	
			7	11.9	36.0	85.6	219	400	1055	1574	
				10	10.1	25.0	75.0	210	320	763	1184
			Stage	Ratio	PGE-50	PGE-70(T)	PGE-90(T)	PGE-120(T)	PGE-142(T)	PGE-180(T)	PGE-220T
				15	13.8	44.2	95.2	283	482	1151	1670
Nominal Output Torqu	ue T _{2N}	N • m		20	11.9	35.9	74.6	249	490	1055	1574
				25	13.8	43.0	95.2	283	473	1151	1670
				30	13.8	43.0	95.2	283	473	1151	1670
			2	35	13.8	43.0	95.2	283	473	1151	1670
			2	40	13.8	43.0	95.2	283	473	1151	1670
				50	13.8	43.0	95.2	283	473	1151	1670
				70	11.9	36.0	85.6	219	400	1055	1574
				100	10.1	25.0	75.0	210	320	763	1184
	_	NI						nal Output To			
Emergency Stop Torqu	ue T _{2NOT}	N • m			(* Max.	Output Tor	que T _{2B} = 6	50% of Emerg	gency Stop To	orque)	
Nominal Input Spee	ed n _{in}	rpm	1,2	3-100	3000	3000	3000	2500	2000	2000	2000
Max. Input Speed r	າ _{1max}	rpm	1,2	3-100	6000	6000	6000	5000	4000	4000	4000
Micro Backlash P	0	arcmin	1 2	3-10 15-100	-	-	-	≦3 ≦5	≦3 ≦5	≦3 ≤5 <u>≤</u> 5	≦3 ≦5 ≦5
Precision Backlash	P1	arcmin	1 2	3-10 15-100	- -	≦ 6 ≦ 9	≦ 6 ≦ 9	≦5 ≦5 ≦7	<u>≤5</u> ≤5 ≤7	≦5 ≦7	≦5 ≦7
Standard Backlash	P2	arcmin	1 2	3-10 15-100	≦12 ≤15	≦9 ≤12	≦9 ≦12	≦7 ≦9	≦7 ≦9	≦7 ≦9	≦7 ≦9
Torsional Rigidity	У	N • m /arcmin	1,2	3-100	1.0	2.8	7.5	15.5	30	 57	110
Max. Radial Load F	1 2rB	N	1,2	3-100	450	1200	2050	4250	7680	9080	13500
Max. Axial Load F ₂	1 2aB	N	1,2	3-100	320	900	1420	2930	4680	5100	7300
Operating Temp).	°C		3-100				-10°C ~ +90)°C		
Service Life		hr		3-100		20	0,000 (10,00	00 Continuou	s Operation)		
Efficiency		%	1 2	3-10				≧ 96% ≥ 92%			
			1	12-100 3-10	0.7	1.4	3.0	<u>≥ 92%</u> 7.3	15.6	26	56
Weight		kg	2	12-100	0.7	2.2/1.7	5.0/3.4	11.5/8.5	20.7/17.2	36/31	62
Mounting Position	on	-	1,2	3-100	0.5	_,	-,	Any Direction		, . –	
Noise Level ²		dBA/1m	1,2	3-100	60	62	65	65	70	70	75
Protection Class	;	-	1,2	3-100				IP65			
Lubrication		-	1,2	3-100			Syı	nthetic Lubric	ant		
					Inertia	(J1)					
Stage	R	latio	un	it	PGE-50	PGE-70	PGE-90	PGE-120	PGE-142	PGE-180	PGE-220
		3			0.03	0.20	0.81	2.20	7.89	25.2	77.9
		4			0.02	0.16	0.65	1.80	5.83	19.8	56.5
1		5			0.02	0.15 0.14	0.62 0.60	1.61 1.55	5.38 5.22	18.3 17.8	53.3 53.0
		7 10	Kg • 0	cm ²	0.02	0.14	0.60	1.53	5.22	17.8	53.0
Stage		Ratio	1.9	•	PGE-50			PGE-120(T)	PGE-142(T)	PGE-180(T)	
3.590		20/25			0.02			1.61(0.62)	5.38(1.61)	18.3(5.38)	18.3
2		35/40			0.02			1.55(0.60)	5.22(1.55)	17.8(5.22)	17.8
		70/100			0.02			1.53(0.60)	5.20(1.53)	17.6(5.20)	17.6

^{* 1.} Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio = 100 (2-stage). **The above figures/specifications are subject to change without prior notice.

PGEH

Sesame Motor PGEH in-line planetary gearheads provide integration between superior operating performance and cost effectiveness. One-piece planet carrier/output shaft and newly designed gear profile benefit higher output torque, precision, loading capacity and lower noise level. High quality gears and components are utilized to create compact and rigid unit with low backlash and maintenance-free operation. 3 levels of precision are available with max frame size 180 mm. Adapters for all servo motors.

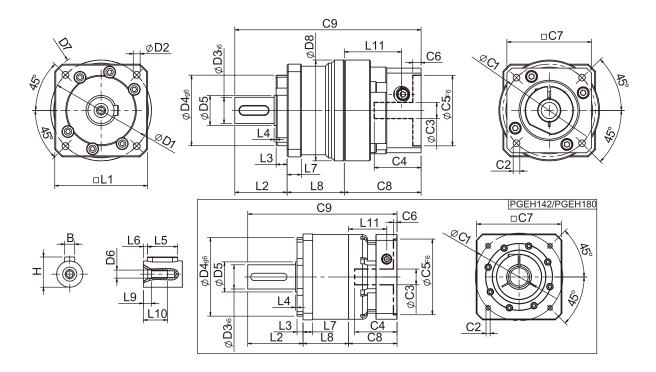


Frame Size (mm)	50, 70, 90, 120, 142,180
Ratio	3:1-100:1
Nominal Input Speed (rpm)	2,500 - 4,000
Max Input Speed (rpm)	4,000 - 8,000
Backlash (arc-min)	1 Stage : 3 - 8 2 Stages : 5 - 10
Noise Level (dBA / 1m)	58 - 68

Features

- ► One-piece planet carrier/output shaft, high torsional rigidity and loading capacity.
- ► One-piece compact ring gear design, high precision and output torque.
- ► Alloy steel precision gears, low backlash, low noise, high wear resistance.
- ► Lubricated for life and IP65 sealing, maintenance free.
- ► Adapters for all servo motors.

PGEH Single Stage Dimensions



Specifications Unit:mm

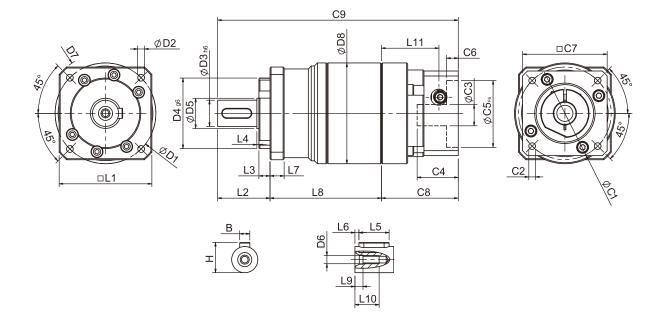
Dimensions	PGEH50	PGEH70	PGEH90	PGEH120	PGEH142	PGEH180
D1	50	70	100	130	165	215
D2	3.4	5.5	6.8	9	10.5	13
D3h6	13	16	22	32	40	55
D4g6	35	50	80	110	130	160
D5	15	25	35	45	50	70
D6	M4x0.7P	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P
D7	60	82	118	148	186	239
D8	50	70	94.5	120	-	-
L2	46	64	90	118	142	182
L3	26	37	43	59	91.5	100.5
L4	5.5	7	5	6	10	16
L5	1	1.5	1.5	3.5	2.5	2.5
L6	15	25	32	40	60	70
L7	2	2	3	5	5	6
L8	7	9.7	13.5	15.7	16	20
L9	28.3	37	51	61	75.5	94
L10	4	4	4.5	6	6	8
L11	12	16.5	20.5	30	38	48
L12	28.5	35.5	40.7	53.8	62.8	70
C1 ²	46	70	90	115	145	200
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 ²	≦8/≦11	<i>≦</i> 14/ <i>≦</i> 19	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 32/ <u>≤</u> 38	≦35/≦38	≦50
C4 ²	26.5	37.6	41.4	51.3	66.5	82
C5 ² _{F6}	30	50	70	95	110	114.3
C6 ²	4.1	4.5	6	6	5.5	10
C7 ²	42	60	90	115	140	180
C8 ²	38.1	46.5	55.4	70	80	95
C9 ²	92.4	120.5	149.4	190	247	289.5
В	5	5	6	10	12	16
Н	15	18	24.5	35	43	59

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]bigstar$ Specification subject to change without notice.



PGEH Double Stage Dimensions-1



Specifications

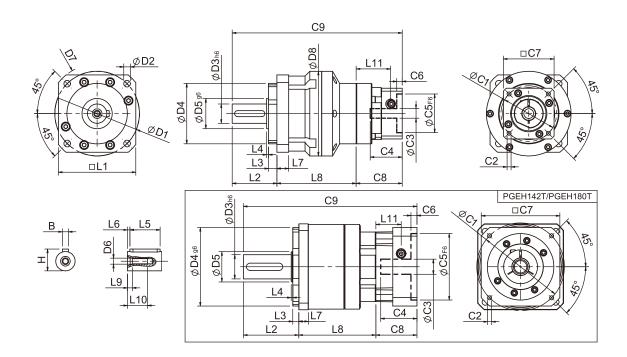
Dimensions	PGEH50	PGEH70	PGEH90
D1	50	70	100
D2	3.4	5.5	6.8
D3h6	13	16	22
D4g6	35	50	80
D5	15	25	35
D6	M4x0.7P	M5x0.8P	M8x1.25P
D7	60	82	118
D8	50	70	94.5
L1	46	64	90
L2	26	37	43
L3	5.5	7	5
L4	1	1.5	1.5
L5	15	25	32
L6	2	2	3
L7	7	9.7	13.5
L8	55.3	70	95
L9	4	4	4.5
L10	12	16.5	20.5
L11	28.5	35.5	40.7
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	≦8/≦11	<u>≤</u> 14/ <u>≤</u> 19	≦19/≦24
C4 ²	26.5	37.6	41.4
C5 ² F6	30	50	70
C6 ²	4.1	4.5	6
C7 ²	42	60	90
C8 ²	38.1	46.5	55.4
C9 ²	119.4	153.5	193.4
В	5	5	6
Н	15	18	24.5

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.



[★] Specification subject to change without notice.

PGEH Double Stage Dimensions-2



Specifications Unit:mm

Dimensions	PGEH70T	PGEH90T	PGEH120T	PGEH142T	PGEH180T
D1	70	100	130	165	215
D2	5.5	6.8	9	10.5	13
D3h6	16	22	32	40	55
D4g6	50	80	110	130	160
D5	25	35	45	50	70
D6	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P
D7	82	118	148	186	239
D8	70	94.5	120	-	-
L1	64	90	118	142	182
L2	37	43	59	91.5	100.5
L3	7	5	6	10	16
L4	1.5	1.5	3.5	2.5	2.5
L5	25	32	40	60	70
L6	2	3	5	5	6
L7	9.7	13.5	15.7	16	20
L8	65.5	83.5	103.5	127.5	166
L9	4	4.5	6	6	8
L10	16.5	20.5	30	38	48
L11	28.5	35.5	40.7	41.8	62.8
C1 ²	46	70	90	115	145
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P
C3 ²	≦8/≦11	<i>≦</i> 14/ <i>≦</i> 19	≦19/≦24	<i>≦</i> 24/ <i>≦</i> 32/ <i>≦</i> 38	<u>≤</u> 35
C4 ²	26.5	37.6	41.4	56	66.5
C5 ² F6	30	50	70	95	110
C6 ²	4.1	4.5	6	10	5.5
C7 ²	42	60	90	115	140
C8 ²	38.1	46.5	55.4	63	80
C9 ²	140.6	173	217.9	282	346.5
В	5	6	10	12	16
Н	18	24.5	35	43	59

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]star$ Specification subject to change without notice.



PGEH Specifications

Nominal Output Torque Table N - m	Sp	pecifications		Stage	Ratio	PGEH-50	PGEH-70	PGEH-90	PGEH-120	PGEH-142	PGEH-180
Standard Backlash P1 Archinal Input Speed n Input Speed					3	19	53	145	290	520	950
Nominal Cutput Torque Tall Name					4	20		150		550	
Nominal Cutput Torque Tank Nominal Cutput Torque Torque Tank Nominal Cutput Torque Tank Nominal Cutput Torque Tank Nominal Cutput Torque Tank Nominal Cutput Torque Tank Nominal Cutput Torque Tank Nominal Cutput Torque Tank Nominal Cutput Torque Tank Nominal Cutput Torque Tank Nominal Cutput Torque Tank Nominal Cutput Torque Tank Nominal Cutput Torque Tank Nominal Cutput Torque Tank Nominal Cutput Torque Tank Nominal Cutput Torque Tank Nominal Cutput Torque Tank Nominal Cutput Torque Tank Nominal					5	17		140	290	600	1050
Nominal Output Torque T _{Jac} N m Stage Ratio PoEH-Sp (PoEH-Sp (Po				1							
Nominal Output Torque Tay Name				1							
Nominal Output Torque Tax Name											
Nominal Output Torque T _{ank} Nomin					9	11	37	95	220	430	800
Nominal Output Torque T _{ax} N					10	11	37	95	220	430	800
Nominal Output Torque Tay				Stage							
Precision Backlash P0											
Stage Ratio Processing Record Processi	Nominal Out	put Torque T _{2N}	N•m								
Standard Backlash P1 Arcmin 1 3-10 5-6							54				
A											
Standard Backlash P1 Arcmin 1 3-10 5-6 6 6 6 6 5 6 5 5 5											
So											
Standard Backlash P2				2							
Torsional Rigidity Name Rigidity Name Na					50						1050
Semigrancy Stop Torque Tallor Norm Norm 1											1000
Semigrancy Stop Torque Tallor Norm Norm 1											
Emergency Stop Torque T _{avor} N-m					80		41				
Nominal Input Speed n N-m					90	11					
Nominal Input Speed n_Inst								95		430	
Nominal Input Speed n	- CI				100						
Max. Input Speed n Input				1.0	2 100		Лах. Output T	orque T _{2B} =609	% of Emergence	y Stop Torque)	0500
Micro Backlash PO			rpm	1,2		4000	4000	3000	3000	2500	2500
Micro Backlash P0	Max. Input	Speed n _{1max}	rpm								
Precision Backlash P1 arcmin 1 3-10 ≤ 6 ≤ 6 ≤ 6 ≤ 6 ≤ 6 ≤ 5 ≤ 5 ≤ 5 ≤ 5 ≤ 5 ≤ 5 ≤ 5 ≤ 5 ≤ 5 ≤ 5 ≤ 5 ≤ 5 ≤ 5 ≤ 5 ≤ 5 ≤ 5 ≤ 5 ≤ 5 ≤ 5 ≤ 5 ≤ 5 ≤ 5 ≤ 7 ≤ 7 <th< td=""><td>Micro Pa</td><td>schlach DO</td><td>arcmin</td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>	Micro Pa	schlach DO	arcmin	-							
Standard Backlash P1	IVIICIO Ba	ickiash Pu	arcillili	2	12-100						
Standard Backlash P1			aremin	1	3-10	≦ 6	≦ 6	≦6	≦5	≦5	≦5
Standard Backlash P2	Precision E	Backlash P1	arcillill	2							
Torsional Rigidity											
Torsional Rigidity	Standard E	Backlash P2	arcmin								
Max. Radial Load F _{2a8} ¹ N 1,2 3-100 2.5 6 12 23 50 145 Max. Radial Load F _{2a8} ¹ N 1,2 3-100 640 1260 2230 4300 7140 11050 Max. Axial Load F _{2a8} ¹ N 1,2 3-100 410 600 1500 3340 4670 6460 Operating Temp. °C 3-100 20,000 (10,000 Continuous operation) Efficiency % 1 3-10 20,000 (10,000 Continuous operation) Efficiency % 1 3-10 20,000 (10,000 Continuous operation) Efficiency % 1 3-10 20,000 (10,000 Continuous operation) Efficiency %g 1 3-10 20,000 (10,000 Continuous operation) Efficiency %g 1 3-10 20,000 (10,000 Continuous operation) Meight Mg 1 3-10 20,000 (13,000 Continuous operation) Meight Mg 1			Nem		12-100	1 310	≥10	≥10	≥9		. ≥9
Max. Axial Load F _{zab} ¹ N 1,2 3-100 410 600 1500 3340 4670 6460 Operating Temp. °C 3-100 -10°C ~ +90°C Service Life hr 3-100 20,000 (10,000 Continuous operation) Efficiency % 1 3-100 20,000 (10,000 Continuous operation) Efficiency kg 1 3-100 2994% Weight kg 1 3-10 0.6 1.3 3.5 7.8 16.1 27 Mounting Position - 1,2 3-100 -9 2.0(1.6) 5.6(3.9) 9.5 19 34 Mounting Position - 1,2 3-100 58 60 63 65 67 68 Protection Class - 1,2 3-100 Synthetic Lubricant Lubrication - 1,2 3-100 Synthetic Lubricant Stage Ratio unit	Torsiona	al Rigidity	/arcmin	1,2	3-100	2.5	6	12	23	50	145
Operating Temp. °C 3-100 20,000 (10,000 Continuous operation) Efficiency 1 3-10 20,000 (10,000 Continuous operation) Efficiency 1 3-10 20,000 (10,000 Continuous operation) Efficiency 1 3-10 0.6 1.3 3.5 7.8 16.1 27 Weight kg 1 3-10 0.6 1.3 3.5 7.8 16.1 27 Mounting Position - 1,2 3-100 Any Direction Noise Level 2 dBA/Im 1,2 3-100 58 60 63 65 67 68 Protection Class - 1,2 3-100 Synthetic Lubricant Inertia (J1) Stage Ratio unit PGEH-50 PGEH-70 PGEH-90 PGEH-120 PGEH-142 PGEH-180 1 5 0.02 0.18 0.67 1.66 7.17 25.86 0.02 0.14 0.60 1.45 6.17 22.92	Max. Radia	al Load F _{2rB} ¹	N	1,2	3-100	640	1260	2230	4300	7140	11050
Service Life hr 3-100 20,000 (10,000 Continuous operation) Efficiency % 1 3-10 ≥97% Weight kg 1 3-10 0.6 1.3 3.5 7.8 16.1 27 Mounting Position - 1,2 3-100 - 3-100 - 3-100 - 4ny Direction Noise Level 2 dBA/1m 1,2 3-100 58 60 63 65 67 68 65 67 68 Protection Class - 1,2 3-100 - 1,2 3-100 Synthetic Lubricant Lubrication - 1,2 3-100 Synthetic Lubricant Inertia (J1) Stage Ratio unit PGEH-50 PGEH-70 PGEH-90 PGEH-120 PGEH-142 PGEH-180 0.03 0.23 0.97 2.35 10.00 30.50 0.00 30.50 0.02 0.11 0.65 1.50 6.52 23.63 0.02 0.12 0.17 0.65 1.50 6.52 23.63 0.02 0.14 0.60 1.45 6.17 22.92 0.02 0.14 0.60 1.45 6.17 22.92 0.02 0.14 0.60 0.145 6.17 22.92 0.02 0.17(0.02) 0.65(0.17) PGEH-120(T) PGEH-142(T) PGEH-180(T) 0.02 0.17(0.02) 0.65(0.17) 0.65 1.50 6.52 0.02 0.17(0.02) 0.65(0.17) 0.65 1.50 6.52				1,2		410	600			4670	6460
Befficiency % 1 3-10 3-10 297%			_ °C								
Efficiency % 1 3-10 2 12-100 294% Weight kg 1 3-10 0.6 1.3 3.5 7.8 16.1 27 Mounting Position - 1,2 3-100 3-100 5.6(3.9) 9.5 19 34 Mounting Position - 1,2 3-100 58 60 63 65 67 68 Protection Class - 1,2 3-100 3-100 5.6(3.9) 7.8 1.0	Servi	ce Life	hr				20,00	00 (10,000 C	ontinuous op	peration)	
Meight Meight			2/	1	3-10						
Weight kg 1 3-10 0.6 1.3 3.5 7.8 16.1 27 Mounting Position - 1,2 3-100 Any Direction Noise Level ² dBA/1m 1,2 3-100 58 60 63 65 67 68 Protection Class - 1,2 3-100 Synthetic Lubricant Stage Ratio unit PGEH-50 PGEH-70 PGEH-90 PGEH-120 PGEH-142 PGEH-180 3 0.03 0.23 0.97 2.35 10.00 30.50 0.02 0.18 0.67 1.66 7.17 25.86 0.02 0.17 0.65 1.50 6.52 23.63 0.02 0.14 0.60 1.45 6.17 22.92 0.02 0.14 0.58 1.41 6.10 22.73 Stage Ratio PGEH-50 PGEH-70(T) PGEH-90(T) PGEH-120(T) PGEH-142(T) PGEH-180(T)<	Ettic	iency	%		12-100						
Weight kg 2 12-100 0.9 2.0(1.6) 5.6(3.9) 9.5 19 34 Mounting Position - 1,2 3-100 58 60 63 65 67 68 Protection Class - 1,2 3-100 Synthetic Lubricant Lubrication - 1,2 3-100 Synthetic Lubricant Inertia (J1) Stage Ratio unit PGEH-50 PGEH-70 PGEH-90 PGEH-120 PGEH-142 PGEH-180 3 4 0.03 0.23 0.97 2.35 10.00 30.50 0.02 0.18 0.67 1.66 7.17 25.86 0.02 0.17 0.65 1.50 6.52 23.63 0.02 0.14 0.60 1.45 6.17 22.92 0.02 0.14 0.58 1.41 6.10 22.73 PGEH-50 PGEH-70(T) PGEH-90(T) PGEH-120(T) PGEH-142(T) PGEH-180(T)							1 2			161	27
Mounting Position	We	eight	kg								
Noise Level 2 dBA/1m 1,2 3-100 58 60 63 65 67 68		D :::				0.5	2.0(1.0)			1.3	1 24
Protection Class - 1,2 3-100 IP65 Lubrication - 1,2 3-100 Synthetic Lubricant Inertia (J1) Stage Ratio unit PGEH-50 PGEH-70 PGEH-90 PGEH-120 PGEH-142 PGEH-180 3 4 0.03 0.23 0.97 2.35 10.00 30.50 4 5 0.02 0.18 0.67 1.66 7.17 25.86 0.02 0.18 0.60 1.45 6.17 22.92 0.02 0.14 0.60 1.45 6.17 22.92 0.02 0.14 0.58 1.41 6.10 22.73 Stage Ratio PGEH-50 PGEH-70(T) PGEH-90(T) PGEH-120(T) PGEH-142(T) PGEH-180(T) 0.02 0.17(0.02) 0.65(0.17) 0.65 1.50 6.52 0.02 0.17(0.02) 0.65(0.17) 0.65 1.50 6.52 0.0							1				
Stage Ratio Synthetic Lubricant Inertia (J1)	Noise	Level ²	dBA/1m			58	60			67	68
Stage Ratio Stage Ratio Stage Ratio Stage Ratio Stage Stag	Protecti	ion Class	_	1,2	3-100			IF	65		
Stage Ratio unit PGEH-50 PGEH-70 PGEH-90 PGEH-120 PGEH-142 PGEH-180			<u> </u>					Synthetic	: Lubricant		
Stage Ratio unit PGEH-50 PGEH-70 PGEH-90 PGEH-120 PGEH-142 PGEH-180 1 3 0.03 0.23 0.97 2.35 10.00 30.50 4 5 0.02 0.18 0.67 1.66 7.17 25.86 0.02 0.17 0.65 1.50 6.52 23.63 0.02 0.14 0.60 1.45 6.17 22.92 0.02 0.14 0.58 1.41 6.10 22.73 Stage Ratio PGEH-50 PGEH-70(T) PGEH-90(T) PGEH-120(T) PGEH-142(T) PGEH-180(T) 0.02 0.17(0.02) 0.65(0.17) 0.65 1.50 6.52 0.02 0.17(0.02) 0.65(0.17) 0.65 1.50 6.52 0.02 0.17(0.02) 0.65(0.17) 0.65 1.50 6.52 0.02 0.14(0.02) 0.60(0.14) 0.60 1.45 6.17	LUDII	Cation			1	1	Inertia (
3	Stage	Rati	0		unit	PGEH-50			PGEH-120	PGEH-142	PGEH-180
1						0.03	0.23	0.97	2 3 5	10.00	
1 5 6/7/8 9/10	1 5			\neg			 				
6/7/8 9/10 0.02 0.14 0.60 1.45 6.17 22.92 0.02 0.14 0.58 1.41 6.10 22.73 PGEH-50 PGEH-70(T) PGEH-90(T) PGEH-120(T) PGEH-142(T) PGEH-180(T) 0.02 0.17(0.02) 0.65(0.17) 0.65 1.50 6.52 0.02 0.14(0.02) 0.60(0.14) 0.60 1.45 6.17				-			 				
Stage Ratio 15/20/25 PGEH-50 PGEH-70(T) PGEH-90(T) PGEH-120(T) PGEH-142(T) PGEH-180(T) 2 30/35/40 0.02 0.14(0.02) 0.65(0.17) 0.65 1.50 6.52 0.02 0.14(0.02) 0.60(0.14) 0.60 1.45 6.17						0.02					
Stage Ratio PGEH-50 PGEH-70(T) PGEH-90(T) PGEH-120(T) PGEH-142(T) PGEH-180(T) 15/20/25 0.02 0.17(0.02) 0.65(0.17) 0.65 1.50 6.52 2 30/35/40 0.02 0.14(0.02) 0.60(0.14) 0.60 1.45 6.17					_						
Stage Ratio PGEH-50 PGEH-70(T) PGEH-90(T) PGEH-120(T) PGEH-142(T) PGEH-180(T) 15/20/25 0.02 0.17(0.02) 0.65(0.17) 0.65 1.50 6.52 2 30/35/40 0.02 0.14(0.02) 0.60(0.14) 0.60 1.45 6.17				Ko	a · cm²	0.02	0.14	0.58	1.41	6.10	22.73
15/20/25 30/35/40 0.02 0.17(0.02) 0.65(0.17) 0.65 1.50 6.52 0.02 0.14(0.02) 0.60(0.14) 0.60 1.45 6.17	Stage				,	PGEH-50	PGEH-70(T)	PGEH-90(T)	PGEH-120(T) PGEH-142(T)	PGEH-180(T)
2 30/35/40 0.02 0.14(0.02) 0.60(0.14) 0.60 1.45 6.17	Juge										
				-							
45/50/60//0/80/90/100 0.02 0.14(0.02) 0.58(0.14) 0.58 1.41 6.10	2										
* 1. Applied to the output shaft center at 100 rpm.						0.02	0.14(0.02)	0.58(0.14)	0.58	1.41	6.10

^{* 1.} Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio =

^{**}The above figures/specifications are subject to change without prior notice.

PGF

Sesame PGF series overall designs are suitable for combined operation with servo motor and achieve maximum torque output. Hollow out-put shaft connects perfectly with circular flange drastically to reduce installation space. Precision gear design and gear processing create a planetary gearhead with low backlash operation, low noise, high efficiency and long service life.



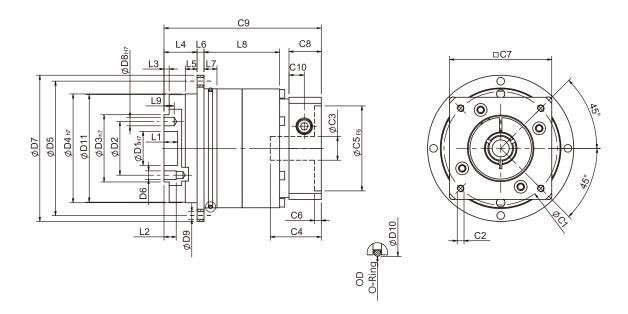


Frame Size (mm)	42, 60, 90, 115, 142
Ratio	3:1-100:1
Nominal Input speed (rpm)	3,000 - 5,000
Max Input Speed (rpm)	5,000 - 10,000
Backlash (arc-min)	1 Stage : 1 - 7 2 Stages : 3 - 9
Noise Level (dBA / 1m)	56 - 65

Features

- ▶ 5 frame sizes available, 42~142 mm.
- ► Backlash as low as 1 arc-minute, ultimate performance.
- ► One-piece planet carrier/output shaft, large torsional rigidity.
- ► Hardened and ground gearing, high wear resistance and impact toughness.
- ➤ One-piece ring gear/housing, high precision and torque output.
- ► Angular contact ball bearings with bending moment capacity up to 950 Nm, and axial load capacities up to 6400 N.
- ▶ Planets with full needle bearing support.
- ► ISO mounting dimensions.
- ▶ IP65 enclosure and synthetic lubricant, maintenance-free service life.

PGF Single Stage Dimensions



Specifications Unit:mm

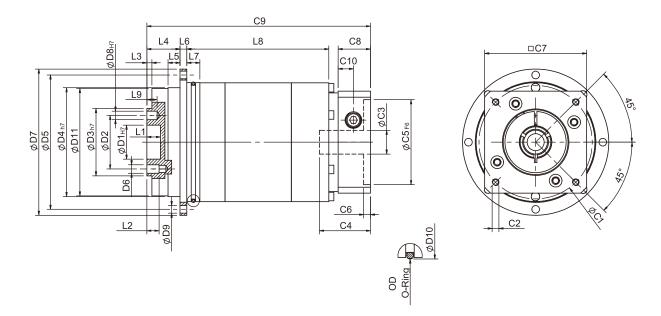
Dimensions	PGF42	PGF60	PGF90	PGF115	PGF142
D1H7	12	20	31.5	40	50
D2	20	31.5	50	63	80
D3h7	28	40	63	80	110
D4h7	47	64	90	110	140
D5	67	79	109	135	168
D6	M3x0.5P	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P
D7	72	86	118	145	179
D8H7	3	5	6	6	8
D9	3.4	4.5	5.5	5.5	6.6
D10	60	70	95	120	152
D11	46.2	63.2	89.2	109.2	139.2
L1	4	8	12	12	12
L2	6	7.2	12	13.5	16
L3	3	3	6	6	6
L4	19.5	19.5	29	29	38
L5	7	7	10	10	14.6
L6	4	4	7	8	10
L7	5	7.7	8	12	12
L8	25	29.5	35	50.5	65
L9	4	6	5	7	7
C1 ²	46	70	90	115	145
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P
C3 ²	≦8/≦11	≦14/≦19	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 32/ <u>≤</u> 38	≦35/≦38
C4 ²	28.5	37.5	41.7	51.1	66.7
C5 ² F6	30	50	70	95	110
C6 ²	4.1	4.5	6	6	5.5
C7 ²	42	60	90	115	140
C8 ²	17	20	26	30	35
C9 ²	75.3	85.5	105	127.5	168.5
C10 ²	7.4	9	11.3	13.9	17.9
OD	56x2	66x2	90x3	110x3	145x3

 $[\]star$ C1~C10 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

[★] Specification subject to change without notice.



PGF Double Stage Dimensions-1



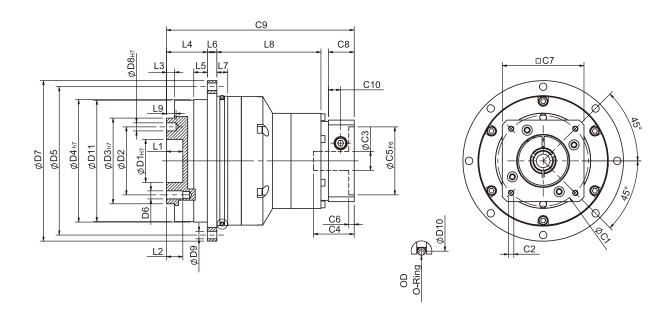
Specifications

Dimensions	PGF42	PGF60	PGF90
D1H7	12	20	31.5
D2	20	31.5	50
D3h7	28	40	63
D4h7	47	64	90
D5	67	79	109
D6	M3x0.5P	M5x0.8P	M6x1.0P
D7	72	86	118
D8H7	3	5	6
D9	3.4	4.5	5.5
D10	60	70	95
D11	46.2	63.2	89.2
L1	4	8	12
L2	6	7.2	12
L3	3	3	6
L4	19.5	19.5	29
L5	7	7	10
L6	4	4	7
L7	5	7.7	8
L8	54.5	68.5	80
L9	4	6	7
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	≦8/≦11	≦14/≦19	≦19/≦24
C4 ²	28.6	37.5	41.7
C5 ² _{F6}	30	50	70
C6 ²	4.1	4.5	6
C7 ²	42	60	90
C8 ²	17	20	26
C9 ²	103	124.5	149.1
C10 ²	7.4	9	11.3
OD	56x2	66x2	90x3

[★] C1~C10 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

[★] Specification subject to change without notice.

PGF Double Stage Dimensions-2



Specifications

Dimensions	PGF60T	PGF90T	PGF115T	PGF142T
D1 _{H7}	20	31.5	40	50
D2	31.5	50	63	80
D3 _{h7}	40	63	80	100
D4 _{h7}	64	90	110	140
D5	79	109	135	168
D6	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P
D7	86	118	145	179
D8 _{H7}	5	6	6	8
D9	4.5	5.5	5.5	6.6
D10	70	95	120	152
D11	63.2	89.2	109.2	139.2
L1	8	12	12	12
L2	7.2	12	13.5	16
L3	3	6	6	6
L4	19.5	29	29	38
L5	7	10	10	14.6
L6	4	7	8	10
L7	7.7	8	10	12
L8	61.2	68	89.5	110
L9	6	7	7	7
C1 ²	46	70	90	115
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P
C3 ²	≦8/≦11	≦14/≦19	≦19/≦24	≦24/≦32/≦38
C42	28.6	37.5	41.7	51.1
C5 ² F6	30	50	70	95
C6 ²	4.1	4.5	6	6
C7 ²	42	60	90	115
C8 ²	17	20	26	30
C9 ²	109.7	136.5	159.6	198
C10 ²	7.4	9	11.3	13.9
OD	66x2	90x3	110x3	145x3

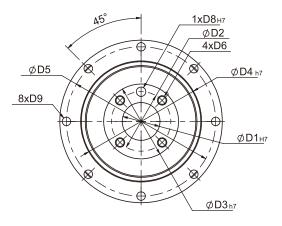
 $[\]star$ C1~C10 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

[★] Specification subject to change without notice.

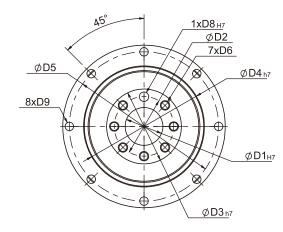


PGF Flange Dimensions

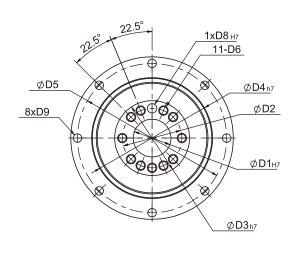
PGF42



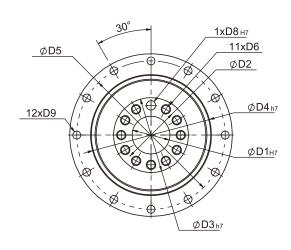
PGF60 PGF90



PGF115



PGF142



Specifications Unit:mm

Dimensions	PGF42	PGF60	PGF90	PGF115	PGF115
D1 _{H7}	12	20	31.5	40	50
D2	20	31.5	50	63	80
D3 _{h7}	28	40	63	80	100
D4 _{h7}	47	64	90	110	140
D5	67	79	109	135	168
D6	M3x0.5P	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P
D8 _{H7}	3	5	6	6	8
D9	3.4	4.5	5.5	5.5	6.6

 $[\]star$ Specification subject to change without notice.

PGF Specifications

Specific	cations		Stage	Ratio	PGF-42	PGF-60	PGF-90	PGF-115	PGF-142
				3	-	40	105	180	340
				4	16	43	110	240	500
			1	5	17	50	130	290	600
				7	14	44	125	270	530
				10	11	37	95	220	430
			Stage	Ratio	PGF-42		PGF-90(T)		PGF-142T
Nominal Output Torqu	ıe T _{2N}	N•m		15	-	40	105	180	600
	214			20	16	43	110	240	600
				25	17	50	130	290	600
				30	17	50	130	290	600
				35	17	50	130	290	600
			2	40	17	50	130	290	600
				50	17	50	130	290	600
				70	14	44	125	270	530
				100	11	37	95	220	430
Emergency Stop Torque	e T _{2NOT}	N⋅m			(30	times of Nomi	nal Output To		
Nominal Input Speed	d n _{in}	rpm	1,2	3-100	5000	5000	4000	4000	3000
Max. Input Speed n ₁	lmax	rpm	1,2	3-100	10000	10000	8000	8000	5000
Micro Backlash PO	<u> </u>		1	3-10	≦3	≦3	≦3	≦1	≦1
IVIICIO BACKIASII PO		arcmin	2	15-100	≦ 5	≦ 5	≦ 5	≦3	≦3
Precision Backlash F	P1	arcmin	1 2	3-10 15-100	≦ 5 ≦ 7	≦ 5 ≦ 7	≦ 5 ≦ 7	≦3 ≦5	≦3 ≦5
Standard Backlash F	P2	arcmin	1 2	3-10 15-100	≦7 ≦9	≦7 ≦9	≦7 ≦9	≦5 ≦7	≦5 <u>≤</u> 7
Torsional Rigidity	'	N·m /arcmin	1,2	3-100	6	12	28	75	145
Max. Bending Momen		N · m	1,2	3-100	22.5	36	76	140	950
Max. Axial Load F _{2a}		N	1,2	3-100	465	635	1060	1580	6400
Operating Temp.		℃		3-100	-10°C ~ +90°C				
Service Life		hr		3-100		20,000 (10		iuous operati	on)
Efficiency		%	1	3-10 15-100			≥97% > 04%		
			2	3-10	0.7	1.4	<u>≥</u> 94% 3.2	6.0	13.6
Weight		kg	1 2	15-100	1.1	2.2(1.7)	5.2 5.0(4.0)	6.0 7.9	13.6 17.9
Mounting Position	n	_	1,2	3-100	<u> </u>		Any Direction		11.3
Noise Level ²		dBA/1m	1,2	3-100	56	58	60	63	65
Protection Class		- ab/y1111	1,2	3-100	-		IP65		
Lubrication		-	1,2	3-100		Sv	nthetic Lubi	ricant	
Inertia (J1)									
Stage		Ratio		unit	PGF-42	PGF-60	PGF-90) PGF-115	PGF-142
		3			-	0.19	0.72	2.35	9.05
		4]		0.18	0.67	1.66	7.17
1		5			0.02	0.17	0.65	1.50	6.52
		7			0.02	0.14	0.60	1.45	6.17
		10 Kg		Kg · cm²	0.02	0.14	0.58	1.41	6.10
Stage		Ratio		-	PGF-42	PGF-60(T)			
		15/20/25	_		0.02	0.17(0.02)	0.65(0.17		2.35
2		30/35/40	_		0.02	0.14(0.02)	0.60(0.14	·	1.45 1.41
		50/70/100			0.02	0.14(0.02)	0.58(0.14	1) 0.58	1.41

 $^{\,^*}$ 1. Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.



^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio =

^{**}The above figures/specifications are subject to change without prior notice.

PGFR

The PGFR series of flange type right angle helical gearbox provide a wide range of performance levels to high positioning accuracy and motion control applications, particularly when high precision and high torsional rigidity are required. Frame sizes 42-142 mm with the best level of backlash ≤ 2 arc-min. Nominal input speed up to 10000 rpm. The PGFR is specially well suited to work with pinion and rack for linear operation. Commonly adapted in metal cutting machines, wood processing equipment, machine centers and highly dynamic motion control systems. In-line configuration (PGF series) is also available with max. Frame size 142 mm.

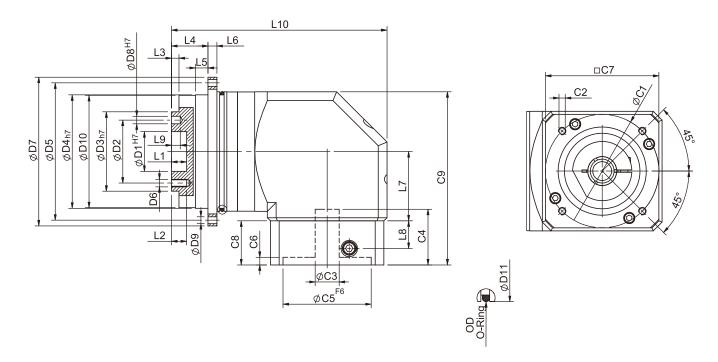


Frame Size (mm)	42, 60, 90, 115, 142
Ratio	3:1-200:1
Nominal Input Speed (rpm)	3,000 - 5,000
Max Input Speed (rpm)	5,000 - 10,000
Backlash (arc-min)	1 Stage : 2 - 8 2 Stages : 4 - 10
Noise Level (dBA / 1m)	62 - 70

Features

- ➤ 3 levels of backlash, 5 frame sizes available from 42-142 mm.
- ▶ Premium and precision gear design, ratios from 3-200:1.
- ► One-piece planet carrier/output shaft, high rigidity and radial load capacity.
- ► Hardened and ground gearing, high wear resistance and impact toughness.
- ➤ One-piece ring gear/housing, high precision and torque output.
- ► Planets with full needle bearing support.
- ▶ IP65 enclosure and synthetic lubricant, maintenance-free service life.

PGFR Single Stage Dimensions



Specifications Unit:mm

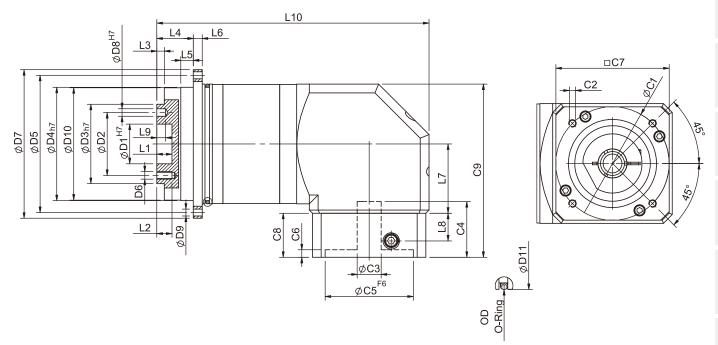
Dimensions	PGFR42	PGFR60	PGFR90	PGFR115	PGFR142
D1 _{H7}	12	20	31.5	40	50
D2	20	31.5	50	63	80
D3h7	28	40	63	80	110
D4h7	47	64	90	110	140
D5	67	79	109	135	168
D6	M3x0.5P	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P
D7	72	86	118	145	179
D8 _{H7}	3	5	6	6	8
D9	3.4	4.5	5.5	5.5	6.6
D10	46.2	63.2	89.2	109.2	139.2
D11	60	70	95	120	152
L1	4	8	12	12	12
L2	6	7.2	12	13.5	16
L3	3	3	6	6	6
L4	19.5	19.5	29	29	38
L5	7	7	10	10	14.6
L6	4	4	7	8	10
L7	32.2	44.8	55	69	71
L8	13.5	21.5	22	32	44.7
L9	4	6	7	7	7
L10	92.2	123.9	171.1	200.2	250.7
C1 ²	46	70	90	90	145
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P
C3 ²	<u>≤</u> 8/ <u>≤</u> 11	<u>≤</u> 14/ <u>≤</u> 19	<u>≤</u> 19/ <u>≤</u> 24	<u>≤</u> 24/ <u>≤</u> 32	<u>≤</u> 35
C4 ²	29	34	44	53.5	76.8
C5 ² _{F6}	30	50	70	70	110
C6 ²	6	5	5	5.5	9
C7 ²	42.6	60	90	115	140
C8 ²	25	33	35	48	65
C9 ²	75.3	112.8	137.5	176.5	225.5
OD	56x2	66x2	90x3	110x3	145x3

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]star$ Specification subject to change without notice.



PGFR Double Stage Dimensions-1



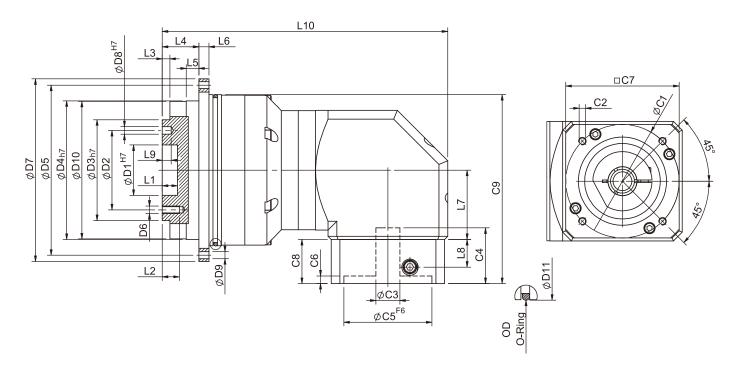
Specifications

Dii	DCED42	DCEDCO	DCEDOO
Dimensions	PGFR42	PGFR60	PGFR90
D1 _{H7}	12	20	31.5
D2	20	31.5	50
D3 _{h7}	28	40	63
D4h7	47	64	90
D5	67	79	109
D6	M3x0.5P	M5x0.8P	M6x1.0P
D7	72	86	118
D8 _{H7}	3	5	6
D9	3.4	4.5	5.5
D10	46.2	63.2	89.2
D11	60	70	95
L1	4	8	12
L2	6	7.2	12
L3	3	3	6
L4	19.5	19.5	29
L5	7	7	10
L6	4	4	7
L7	32.2	44.8	55
L8	13.5	21.5	22
L9	4	6	7
L10	119.9	159.3	216.1
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	≦8/≦11	<i>≦</i> 14/ <i>≦</i> 19	≦19/≦24
C4 ²	29	34	44
C5 ² _{F6}	30	50	70
C6 ²	6	5	5
C7 ²	42.6	60	90
C8 ²	25	33	35
C9 ²	78.5	112.8	137.5
OD	56x2	66x2	90x3

 $[\]star$ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

[★] Specification subject to change without notice.

PGFR Double Stage Dimensions-2



Specifications

Dimensions	PGFR60T	PGFR90T	PGFR115T	PGFR142T
D1 _{H7}	20	31.5	40	50
D2	31.5	50	63	80
D3h7	40	63	80	100
D4h7	64	90	110	140
D5	79	109	135	168
D6	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P
D7	86	118	145	179
D8 _{H7}	5	6	6	8
D9	4.5	5.5	5.5	6.6
D10	63.2	89.2	109.2	139.2
D11	70	95	120	152
L1	8	12	12	12
L2	7.2	12	13.5	16
L3	3	6	6	6
L4	19.5	29	29	38
L5	7	10	10	14.6
L6	4	7	8	10
L7	32.2	44.8	55	69
L8	13.5	21.5	22	32
L9	6	7	7	7
L10	126.6	171.3	226.6	270.7
C12	46	70	90	90
C22	M4x0.7P	M5x0.8P	M6x1.0P	M6x1.0P
C3 ²	≦8/≦11	<u>≤</u> 14/ <u>≤</u> 19	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 32
C42	29	34	44	53.5
C52 _{F6}	30	50	70	70
C6 ²	6	5	5	5.5
C7 ²	42.6	60	90	115
C8 ²	25	33	35	48
C9 ²	84.4	125.3	150	176.5
OD	66x2	90x2	110x3	145x3

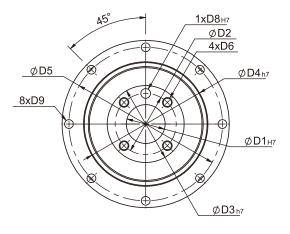
[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

[★] Specification subject to change without notice.



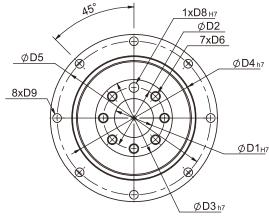
PGFR Flange Dimensions

PGFR42

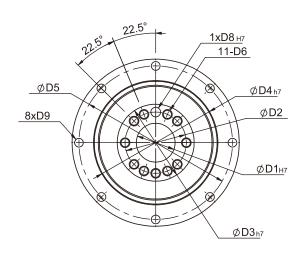


PGFR90

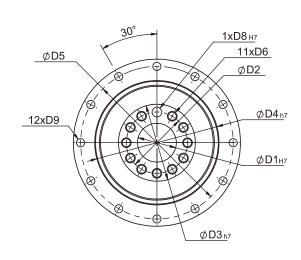
PGFR60



PGFR115



PGFR142



Specifications

Dimensions	PGFR42	PGFR60	PGFR90	PGFR115	PGFR142
D1H7	12	20	31.5	40	50
D2	20	31.5	50	63	80
D3h7	28	40	63	80	100
D4h7	47	64	90	110	140
D5	67	79	109	135	168
D6	M3x0.5P	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P
D8H7	3	5	6	6	8
D9	3.4	4.5	5.5	5.5	6.6

[★] Specification subject to change without notice.

PGFR Specifications

Specifications		Stage	Ratio	PGFR-42	PGFR-60	PGFR-90	PGFR-115	PGFR-142			
				3	_	40	105	180	340		
				4	16	43	110	240	500		
				5	17	50	130	290	600		
			1	7	14	44	125	270	530		
				10	17	50	130	260	540		
				14	14	44	125	270	530		
				20	11	37	95	220	430		
		-	Stage	Ratio	PGFR-42	PGFR-60/ PGFR-60T	PGFR-90/ PGFR-90T	PGFR-115T			
Nominal Output Torqu	οт	N•m		15	-	40	105	180	600		
Normal Output Torqui	C I _{2N}			20	16	43	110	240	600		
				25	17	50	130	290	600		
				30	17	40	105	180	600		
			2	35	17	50	130	290	600		
			2	40	16	43	110	240	600		
				50	17	50	130	290	600		
				70	14	44	125	270	530		
				100	11	37	95	220	430		
				140	14	44	125	270	530		
				200	11	37	95	220	430		
Emergency Stop Torque T _{2NOT} N · n					(3.0 times of Nominal Output Torque) (*Max. Output Torque T ₂₈ =60% of Emergency Stop Torque)						
Nominal Input Speed n _{1N}		rpm	1,2	3-200	5000	5000	4000	4000	3000		
Max. Input Speed n _{1max}		rpm	1,2	3-200	10000	10000	8000	8000	5000		
Micro Backlash P	0	arcmin	1 2	3-20 15-200	-	- -	≦4 ≤ 6	≦2 ≤4	≦2 ≦4		
Duradalan Darildada	D1		1	3-20	<u>≤</u> 6	<u>≦</u> 6	<u>≦</u> 6	<u>≤</u> 4	<u>≤</u> 4		
Precision Backlash	PI	arcmin	2	15-200	≦8	≦8	≦8	<u>≤</u> 7	<u>≤</u> 7		
Standard Backlash	P2	arcmin	1 2	3-20 15-200	≦8 ≤10	≦8 ≦10	≦8 ≦10	≦6 ≦9	≦6 ≦9		
Torsional Rigidity	У	N·m /arcmin	1,2	3-200	6	12	28	75	145		
Max. Bending Moment		N⋅m	1,2	3-200	22.5	36	76	140	950		
Max. Axial Load F ₂		N	1,2	3-200					6400		
Operating Temp	•	℃		3-200			10°C ~ +90°C				
Service Life		hr		3-200		20,000 (10,0		ous Operation	n)		
Efficiency		%	1 2	3-20 15-200			≥95% ≥92%				
Weight		kg	1 2	3-20 15-200	1.1 1.6	2.2 2.9/2.1	6.3 8.3/5.0	13.5 14.8	25.1 26.7		
Mounting Position		-	1,2	3-200			Any Directior	n			
Noise Level ²		dBA/1m	1,2	3-200	62	64	66	68	70		
Protection Class		-	1,2	3-200			IP65				
Lubrication -		1,2	3-200 Intertia	(11)	Syr	thetic Lubric	cant				
Stage Ratio			unit	PGFR-42	PGFR-60	PGFR-90	PGFR-115	PGFR-142			
		3/4/5/7		GIII	0.06	0.40	2.28	6.87	24.2		
1		.0/14/20			0.05	0.40	1.45	4.76	14.5		
Stage		Ratio		Kg ⋅ cm²	PGFR-42	PGRF-60(T)	PGFR-90(T)				
	15	/20/25/35		<u> </u>	0.06	0.40(0.08)	2.28(0.72)	3.02	7.83		
		Others			0.05	0.30(0.06)	1.45(0.38)	1.64	5.00		

^{* 1.} Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.



^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio =

XThe above figures/specifications are subject to change without prior notice.

PGH

Square mounting flange, caged premium class helical planetary gears in an in-line housing through sizes 220 mm. High torque capacity, quiet operation with backlash as low as < 1 arc-min. PGH planetary gearbox series is the best power transmission component for the Industrial Robots, Semiconductor Devices, Automatic Storage System, etc.

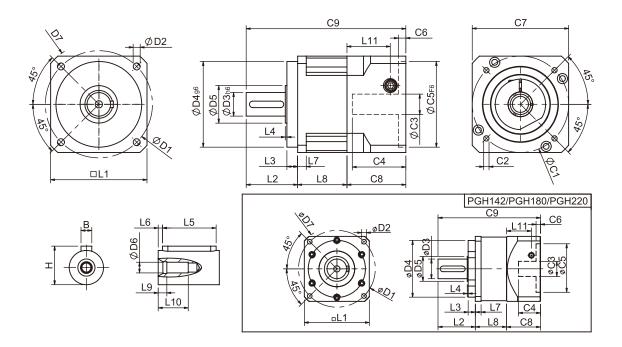


Frame Size (mm)	42-220
Ratio	3:1-100:1
Nominal Input Speed (rpm)	2,000-5,000
Max Input Speed (rpm)	4,000-10,000
Backlash (arc-min)	1 Stage : 1 - 6 2 Stages : 3 - 8
Noise Level (dBA / 1m)	56 - 70

Features

- ► Backlash as low as 1 arc-min, ultimate performance.
- ► One-piece planet carrier/output shaft, high rigidity and radial load capacity.
- ► Hardened and ground gearing, high wear resistance and impact toughness.
- ➤ One-piece ring gear/housing, high precision and torque output.
- ▶ Planets with full needle bearing support.
- ▶ IP65 enclosure and synthetic lubricant, maintenance-free service life.

PGH Single Stage Dimensions



Specifications Unit:mm

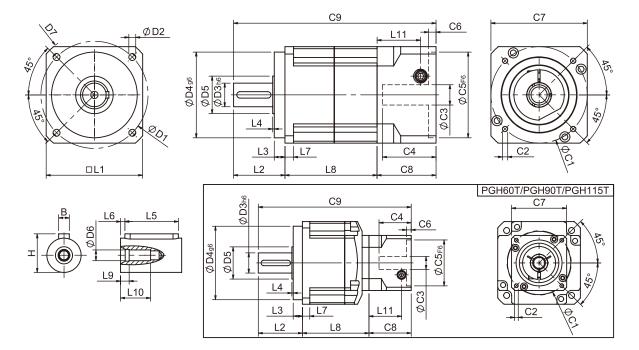
Dimensions	PGH42	PGH60	PGH90	PGH115	PGH142	PGH180	PGH220
D1	50	70	100	130	165	215	250
D2	3.4	5.5	6.5	8.5	10.5	13	17
D3h6	13	16	22	32	40	55	75
D4 ₉₆	35	50	80	110	130	160	180
D5	15	25	35	45	50	70	114.4
D6	M4x0.7P	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	56	80	118	148	186	239	292
L1	42.6	60	90	115	142	182	220
L2	26	37	48	63	91.5	100.5	138
L3	5.5	7	10	10	10	16	30
L4	1	1.5	1.5	3.5	2.5	2.5	3
L5	15	25	32	40	60	70	90
L6	2	2	3	5	5	6	7
L7	4	6	8	11	16	18	20
L8	28.3	37	46	57	75.5	94	111
L9	4	4	4.5	6	6	8	15
L10	14	16.5	20.5	30	38	48	42
L11	29	35.5	40.5	42	63	69.5	96
C1 ²	46	70	90	115	145	200	235
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P	M12x1.75P
C3 ²	≦8/≦11	≦14/≦19	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 32/ <u>≤</u> 38	<u>≦</u> 35/ <u>≦</u> 38	≦50	<u>≤</u> 55
C4 ²	27	37	47	56	66.5	82	112
C5 ² _{F6}	30	50	70	95	110	114.3	200
C6 ²	4	4	6	10	6	13	6
C72	42.6	60	90	115	140	180	220
C8 ²	38.5	46	55	63	80	95	120
C9 ²	92.8	120	149	183	247	289.5	369
В	5	5	6	10	12	16	20
Н	15	18	24.5	35	43	59	79.5

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]bigstar$ Specification subject to change without notice.



PGH Double Stage Dimensions-1



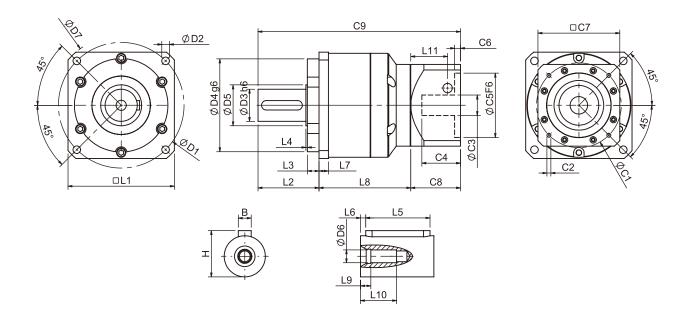
Unit:mm **Specifications**

Dimensions	PGH42	PGH60	PGH60T	PGH90	PGH90T	PGH115T	
D1	50	7		10	130		
D2	3.4	5.			6.5		
D3h6	13	1		2		8.5	
D4 ₉₆	35	5		8	0	110	
D5	15	2	5	3	5	45	
D6	M4x0.7P	M5x	0.8P	M8x2	L.25P	M12x1.75P	
D7	56	8	0	13	L8	148	
L1	42.6	6	0	9	0	115	
L2	26	3	7	4	8	63	
L3	5.5	7	7	1	0	10	
L4	1	1.	5	1	1.5		
L5	15	2	5	3	40		
L6	2	2	2	3	5		
L7	4	(5	3	8		
L8	55.3	70	65.5	86	78.5	99.5	
L9	4	4	1	4	.5	6	
L10	14	16	5.5	20).5	30	
L11	29	35.5	29	40.5	35.5	40.5	
C1 ²	46	70	46	90	70	90	
C2 ²	M4x0.7P	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P	M6x1.0P	
C3 ²	≦8/≦11	≦14/≦19	≦8/≦11	≦19/≦24	≦14	≦19/≦24	
C4 ²	27	37	27	47	37	47	
C5 ² F6	30	50	30	70	50	70	
C6 ²	4	4	4	6	4	6	
C72	42.6	60	42.6	90	60	90	
C8 ²	38.5	46	38.5	55	46	55	
C9 ²	119.8	153 141		189 172.5		217.5	
В	5	5		(10		
Н	15	1	8	24	35		

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

[★] Specification subject to change without notice.

PGH Double Stage Dimensions-2



Specifications Unit:mm

Dimensions	PGH142T	PGH180T	PGH220T	
D1	165	215	250	
D2	10.5	13	17	
D3h6	40	55	75	
D4 _{g6}	130	160	180	
D5	50	70	114.4	
D6	M16x2.0P	M20x2.5P	M20x2.5P	
D7	186	239	292	
L1	142	182	220	
L2	91.5	100.5	138	
L3	10	16	30	
L4	2.5	2.5	3	
L5	60	70	90	
L6	5	6	7	
L7	16	18	20	
L8	127.5	166	202	
L9	6	8	15	
L10	38	48	42	
L11	42	63	74	
C1 ²	115	145	200	
C2 ²	M8x1.25P	M8x1.25P	M12x1.75P	
C3 ²	<u>≤</u> 24/ <u>≤</u> 32/ <u>≤</u> 38	<u>≤</u> 35/ <u>≤</u> 38	<u>≤</u> 50	
C4 ²	56	66.5	81	
C5 ² F6	95	110	114.3	
C6 ²	10	6	6	
C72	115	140	180	
C8 ²	63	80	93	
C9 ²	282	346.5	433	
В	12	16	20	
Н	43	59	79.5	

 $[\]bigstar \ \text{C1$\sim$C9$ are motor specific dimensions (metric std shown). Size may vary according to motor flange.}$

 $[\]bigstar$ Specification subject to change without notice.



PGH Specifications

Nominal Output Torque T _{are} N-m Stage Sam Politic School Politic	Specificatio	ns		Stage	Ratio	PGH42	PGH60	PGH90	PGH115	PGH142	PGH180	PGH220	
Nominal Output Torque Table					3	19	53		290	520	950	1100	
Nominal Cutput Torque T _{1.NP} Nominal Cutput T _{1.NP} Nominal Cutp													
Nominal Cutput Torque T_na													
Nominal Output Torque Table				1									
Naminal Cutput Torque T_n													
Nominal Output Torque T _{Jack} Nominal Output Torque T _{Jack}													
Nominal Output Torque T _{yee}													
Stage Ratio Part	Nominal Output Tora	iue T	N•m	Stage									
Precision Backlash PD		ZIN			15	19	53	145	290	520	950	2000	
Part								150					
Precision Backlash P1													
Precision Backlash P1													
Percision Backlash P1													
So				_									
Figure Figure				2									
Procession Backlash PD Arcmin 1 3-10 56 140 500 1300 1300 1100 1600													
Bo 17 45 120 260 480 1000 1600 1500 1													
Part													
N-m N-m													
Nominal Input Speed n _{Jinvis} Nom 1.2 3-100 5000 5000 4000 4000 3000 3000 3000 2000													
Nominal Input Speed n _{smx}											300		
Max. Input Speed name rpm 1,2 3-100 10000 10000 8000 8000 6000 6000 4000 Micro Backlash PO arcmin 1 3-10 ≤2 ≤2 ≤2 ≤1 ≤3 ≤5<	Emergency Stop Torque T _{2NOT} N•m						(*Max. Outpu	t Torque T _{2B} =	=60% of Eme	rgency Stop	Torque)		
Micro Backlash PO	Nominal Input Spee	d n _{in}	rpm	1,2	3-100	5000	5000	4000	4000	3000	3000	2000	
Precision Backlash P1	Max. Input Speed r	1 _{1max}	rpm	1,2	3-100	10000	10000	8000	8000	6000	6000	4000	
Precision Backlash P1		_		1	3-10	≤ 2	≦2	≦ 2	≤1	≦ 1	≤1	≤ 1	
Precision Backlash P1 arcmin 1 dis-100 seed ≤ 4 seed ≤ 4 seed ≤ 3 seed ≤ 3 seed ≤ 3 seed ≤ 5 seed ≤ 5 seed ≤ 5 seed ≤ 5 seed ≤ 5 seed ≤ 5 seed ≤ 5 seed ≤ 5 seed ≤ 6 seed ≤ 7 seed ≤ 7 seed ≤ 7 seed ≤ 7 seed ≤ 7 seed ≤ 7 seed ≤ 8 seed ≤ 8 seed ≤ 8 seed ≤ 8 seed ≤ 8 seed ≤ 8 seed ≤ 8 seed ≤ 8 seed ≤ 8 seed ≤ 8 seed ≤ 8 seed ≤ 8 seed ≤ 8 seed ≤ 8 seed ≤ 8 seed ≤ 8 seed ≤ 8	Micro Backlash P0		arcmin										
Standard Backlash P2													
Standard Backlash P2 arcmin 1 2 15-100 5 6 8 5 8 5 8 8 8 8 8 8 8 6 7 5 5 7 5 7 ≤ 5 5 5 7 5 7 ≤ 5 7 5 7 ≤ 7 5 7 ≤ 7 5 7 ≤ 7 5 7 ≤ 7 5 7 ≤ 7 5 7 ≤ 7 5 7 ≤ 7 5 7 5 7 ≤ 7 7 7 7	Precision Backlash	P1	arcmin						≥ 5	≥ 3	≥ 3 ∠ E	≥ 3	
Standard Backlash P2 archim 2 15-100 ≤8 ≤8 ≤8 ≤7 ≤7 ≤7 ≤7 ≤7													
Torsional Rigidity	Standard Backlash	P2	arcmin		1								
Max. Radial Load F _{2x8}				2	15-100	_ ≦8	≦8	≦8	≦ /	≦ /	≦ /	≦ /	
Max. Axial Load F _{2aB} ¹ N 1,2 3-100 410 750 1870 3310 4670 6460 18530 Operating Temp. °C 3-100 -10°C ~ +90°C Service Life hr 3-100 -20,000 (10,000 Continuous Operation) Efficiency % 1 3-100 20,000 (10,000 Continuous Operation) Efficiency % 1 3-100 20,000 (10,000 Continuous Operation) Efficiency % 1 3-100 20,016 1.3 3.5 7.8 16.1 27 55 55 55 55 68.5 68.5 68.5 68.5 68.5 68.5 69 9.5 19 34 68.5 68.5 68.5 69 63 65 67 70 Noise Level 2 dBA/Im 1,2 3-100 5 58 60 63 65 67 70 Inertia (J1) Stage Ratio <th colsp<="" td=""><td>Torsional Rigidity</td><td>У</td><td></td><td>1,2</td><td>3-100</td><td>3</td><td>7</td><td>14</td><td>25</td><td>50</td><td>145</td><td>225</td></th>	<td>Torsional Rigidity</td> <td>У</td> <td></td> <td>1,2</td> <td>3-100</td> <td>3</td> <td>7</td> <td>14</td> <td>25</td> <td>50</td> <td>145</td> <td>225</td>	Torsional Rigidity	У		1,2	3-100	3	7	14	25	50	145	225
Operating Temp. °C 3-100 -10°C ~ +90°C	Max. Radial Load F	1 2rB	N	1,2	3-100	760	1570	3250	6620	9400	14500	33000	
Service Life hr 3-100 20,000 (10,000 Continuous Operation) Service Life hr 3-100 15-100 20,000 (10,000 Continuous Operation) Service Life hr 1 3-10 15-100 3-10 Service Life	Max. Axial Load F ₂	1 2aB	N	1,2	3-100	410	750	1870	3310	4670	6460	18530	
Efficiency	Operating Temp).	°C		3-100	-10°C ~ +90°C							
Efficiency	Service Life		hr		3-100	20 000 (10 000 Continuous Operation)							
Meight Mg				1									
Weight kg 2 15-100 0.9 2.0/1.6 5.6/3.9 9.5 19 34 68.5 Mounting Position - 1,2 3-100 56 58 60 63 65 67 70 Protection Class - 1,2 3-100 56 58 60 63 65 67 70 Protection Class - 1,2 3-100 5 58 60 63 65 67 70 Lubrication - 1,2 3-100 5 Synthetic Lubrication 5 67142 PGH180 PGH20 PGH90 PGH90 PGH115 PGH142 PGH180 PGH220 PGH20 PGH90 PGH90 PGH115 PGH142 PGH180 PGH220 PGH20 PGH90 PGH90 PGH115 PGH142 PGH180 PGH220 PGH20	Efficiency		%						≥ 94%				
Weight kg 2 15-100 0.9 2.0/1.6 5.6/3.9 9.5 19 34 68.5 Mounting Position - 1,2 3-100 56 58 60 63 65 67 70 Protection Class - 1,2 3-100 56 58 60 63 65 67 70 Protection Class - 1,2 3-100 5 58 60 63 65 67 70 Lubrication - 1,2 3-100 5 Synthetic Lubrication 5 67142 PGH180 PGH20 PGH90 PGH90 PGH115 PGH142 PGH180 PGH220 PGH20 PGH90 PGH90 PGH115 PGH142 PGH180 PGH220 PGH20 PGH90 PGH90 PGH115 PGH142 PGH180 PGH220 PGH20				1	3-10	0.6	1.3	3.5	7.8	16.1	27	55	
Mounting Position - 1,2 3-100 56 58 60 63 65 67 70 Protection Class - 1,2 3-100 56 58 60 63 65 67 70 Lubrication - 1,2 3-100 Synthetic Lubricants Inertia (J1) Stage Ratio unit PGH42 PGH60 PGH90 PGH115 PGH142 PGH180 PGH220 4 4 0.03 0.23 0.97 2.35 10.00 30.50 79.50 4 5 0.02 0.18 0.67 1.66 7.17 25.86 58.21 5 0.02 0.17 0.65 1.50 6.52 23.63 54.36 6/7/8 9/10 kg•cm² 0.02 0.14 0.60 1.45 6.17 22.92 54.12 0.02 0.14 0.60 1.45 6.17 22.73 5	Weight		kg			1							
Noise Level ≥ Protection Class dBA/1m 1,2 3-100 56 58 60 63 65 67 70 Protection Class - 1,2 3-100 Inertia (J1) Lubrication - 1,2 3-100 Synthetic Lubricant Stage Ratio unit PGH60 PGH90 PGH115 PGH142 PGH180 PGH20 4 0.03 0.23 0.97 0.23 0.97 0.23 0.97 0.00	Mounting Positio	nn.	_		_	1							
Protection Class - 1,2 3-100 IP65 Lubrication - 1,2 3-100 Synthetic Lubricant Inertia (J1) Stage Ratio unit PGH42 PGH60 PGH90 PGH115 PGH142 PGH180 PGH220 0.02 0.03 0.23 0.97 2.35 10.00 30.50 79.50 4 0.02 0.18 0.67 1.66 7.17 25.86 58.21 0.02 0.17 0.65 1.50 6.52 23.63 54.36 0.02 0.14 0.60 1.45 6.17 22.92 54.12 0.02 0.14 0.58 1.41 6.1 22.73 53.98 Stage Ratio PGH42 PGH60(T) PGH90(T) PGH115(T) PGH142(T) PGH180(T) PGH220(T) 0.02 0.17 (0.02) 0.65 (0.17) 0.65 1.50 6.52 23.63 0.02) i i	-IDA /1		_	F.G.	F0				67	70	
Lubrication - 1,2 3-100 Synthetic Lubricant Stage Ratio unit PGH42 PGH60 PGH90 PGH115 PGH142 PGH180 PGH20 4 0.03 0.23 0.97 2.35 10.00 30.50 79.50 4 5 0.02 0.18 0.67 1.66 7.17 25.86 58.21 0.02 0.17 0.65 1.50 6.52 23.63 54.36 0.02 0.14 0.60 1.45 6.17 22.92 54.12 0.02 0.14 0.58 1.41 6.1 22.73 53.98 Stage Ratio PGH42 PGH60(T) PGH90(T) PGH115(T) PGH142(T) PGH180(T) PGH220(T) 0.02 0.17 (0.02) 0.65 (0.17) 0.65 1.50 6.52 23.63 Stage Ratio PGH42 PGH60(T) PGH90(T) PGH115(T) PGH142(T) PGH180(T) PGH220(T) 0.02 0.17 (0.02) 0.65 (0.			aRA/1m		+	50	58	60		65	67	70	
Inertia (J1) Stage Ratio unit PGH42 PGH60 PGH90 PGH15 PGH142 PGH180 PGH220 1 3 0.03 0.23 0.97 2.35 10.00 30.50 79.50 6 4 0.02 0.18 0.67 1.66 7.17 25.86 58.21 0.02 0.17 0.65 1.50 6.52 23.63 54.36 0.02 0.14 0.60 1.45 6.17 22.92 54.12 0.02 0.14 0.58 1.41 6.1 22.73 53.98 Stage Ratio PGH42 PGH60(T) PGH90(T) PGH115(T) PGH142(T) PGH180(T) PGH220(T) 0.02 0.17 (0.02) 0.65 (0.17) 0.65 1.50 6.52 23.63 2 30/35/40 0.02 0.17 (0.02) 0.65 (0.17) 0.65 1.50 6.52 23.63	Protection Class	S	-	1,2	3-100				IP65				
Inertia (J1) Stage Ratio unit PGH42 PGH60 PGH90 PGH15 PGH142 PGH180 PGH220 1 3 0.03 0.23 0.97 2.35 10.00 30.50 79.50 6 4 0.02 0.18 0.67 1.66 7.17 25.86 58.21 0.02 0.17 0.65 1.50 6.52 23.63 54.36 0.02 0.14 0.60 1.45 6.17 22.92 54.12 0.02 0.14 0.58 1.41 6.1 22.73 53.98 Stage Ratio PGH42 PGH60(T) PGH90(T) PGH115(T) PGH142(T) PGH180(T) PGH220(T) 0.02 0.17 (0.02) 0.65 (0.17) 0.65 1.50 6.52 23.63 2 30/35/40 0.02 0.17 (0.02) 0.65 (0.17) 0.65 1.50 6.52 23.63	Lubrication		_	1.2	3-100			Sv	nthetic Lubric	ant			
Stage Ratio unit PGH42 PGH60 PGH90 PGH115 PGH142 PGH180 PGH220 1 3 0.03 0.23 0.97 2.35 10.00 30.50 79.50 5 0.02 0.18 0.67 1.66 7.17 25.86 58.21 0.02 0.17 0.65 1.50 6.52 23.63 54.36 0.02 0.14 0.60 1.45 6.17 22.92 54.12 0.02 0.14 0.58 1.41 6.1 22.73 53.98 Stage Ratio PGH42 PGH60(T) PGH90(T) PGH115(T) PGH142(T) PGH180(T) PGH220(T) 0.02 0.17 (0.02) 0.65 (0.17) 0.65 1.50 6.52 23.63 2 30/35/40 0.02 0.17 (0.02) 0.65 (0.17) 0.65 1.50 6.52 23.63													
1 1 1 1 1 1 1 1 1 1					•	1							
1 4	-		atio	ur	nit	PGH42			PGH115		PGH180	PGH220	
1 4	6		3			0.03	0.23	0.97	2.35	10.00	30.50	79.50	
1 5 6/7/8 8 9/10 8 • cm² 0.02 0.17 0.65 1.50 6.52 23.63 54.36 0.02 0.14 0.60 1.45 6.17 22.92 54.12 0.02 0.14 0.58 1.41 6.1 22.73 53.98 Stage Ratio PGH42 PGH60(T) PGH90(T) PGH115(T) PGH142(T) PGH180(T) PGH220(T) 0.02 0.17 (0.02 0.17 (0.02) 0.65 (0.17) 0.65 1.50 6.52 23.63 2 30/35/40 0.02 0.14 (0.02) 0.60 (0.14) 0.60 1.45 6.17 22.92			4			0.02	0.18	0.67	1.66	7.17	25.86	58.21	
6/7/8 9/10 kg•cm² 0.02 0.14 0.60 1.45 6.17 22.92 54.12 Stage Ratio PGH42 PGH60(T) PGH90(T) PGH115(T) PGH142(T) PGH180(T) PGH220(T) 15/20/25 0.02 0.17 (0.02) 0.65 (0.17) 0.65 1.50 6.52 23.63 2 30/35/40 0.02 0.14 (0.02) 0.60 (0.14) 0.60 1.45 6.17 22.92			5										
9/10 kg•cm² 0.02 0.14 0.58 1.41 6.1 22.73 53.98 Stage Ratio PGH42 PGH60(T) PGH90(T) PGH115(T) PGH142(T) PGH180(T) PGH220(T) 0.02 0.17 (0.02) 0.65 (0.17) 0.65 1.50 6.52 23.63 2 30/35/40 0.02 0.14 (0.02) 0.60 (0.14) 0.60 1.45 6.17 22.92			/7/8	\dashv									
Stage Ratio PGH42 PGH60(T) PGH90(T) PGH115(T) PGH142(T) PGH180(T) PGH220(T) 2 30/35/40 0.02 0.17 (0.02) 0.65 (0.17) 0.60 1.45 6.17 22.92				kg•	cm²								
15/20/25 0.02 0.17 (0.02) 0.65 (0.17) 0.65 1.50 6.52 23.63 2 30/35/40 0.02 0.14 (0.02) 0.60 (0.14) 0.60 1.45 6.17 22.92	Stage												
2 30/35/40 0.02 0.14 (0.02) 0.60 (0.14) 0.60 1.45 6.17 22.92	stage												
45/50/60/70/80/90/100 0.02 0.14 (0.02) 0.58 (0.14) 0.58 1.41 6.10 22.73	<u> </u>					0.02					6.17		
	4	15/50/60/7	70/80/90/100			0.02	0.14 (0.02)	0.58 (0.14)	0.58	1.41	6.10	22.73	

^{* 1.} Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio = 100 (2-stage). XThe above figures/specifications are subject to change without prior notice.

PGHA PGHX

The high rigidity model is mainly used for extremely large double column machine center or horizontal machine tools. The planetary gearboxes will not be distorted or shaken under high torque and emergency stop condition. The turret can be edited instantly without waiting. This rugged gearbox is not only able to withstand the challenges of harsh, high and low temperature environments, but also retains the original low backlash, low noise and other properties of the servo planetary gearbox.

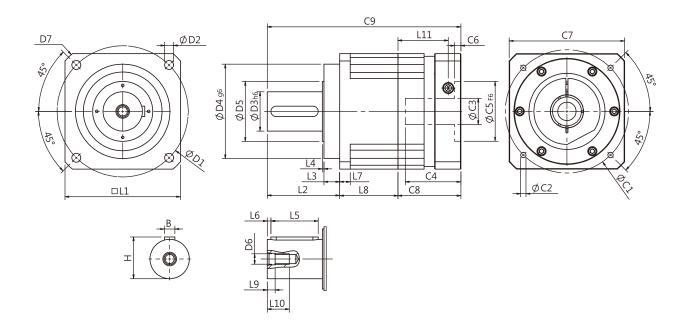


Frame Size (mm)	220, 240
Ratio	3:1-100:1
Nominal Input Speed (rpm)	1,500 - 2,000
Max Input Speed (rpm)	2,500 - 4,000
Backlash (arc-min)	1 Stage: 1 - 5 2 Stages: 3 - 7
Noise Level (dBA / 1m)	70 - 72

Features

- ▶ Designed for large double column machine center or horizontal machine tools.
- ► Backlash as low as 1 arc-minute, ultimate performance.
- ➤ One-piece planet carrier/output shaft, high rigidity and radial load capacity.
- ► Hardened and ground gearing, high wear resistance and impact toughness.
- ► One-piece ring gear/housing, high precision and torque output.
- ► Planets with full needle bearing support.
- ▶ IP65 enclosure and synthetic lubricant, maintenance-free service life.

PGHA & PGHX Single Stage Dimensions



Specifications Unit:mm

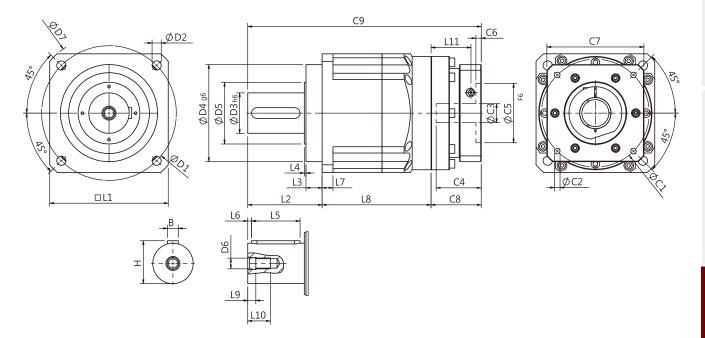
Dimensions	PGHA220	PGHA240	PGHX220	PGHX240
D1	250	-	250	-
D2	17	-	17	-
D3 h6	75	-	75	-
D4 _{g6}	180	-	180	-
D5	114.4	-	114.4	-
D6	M20x2.5P	-	M20x2.5P	-
D7	292	-	292	-
L1	220	-	220	-
L2	138	-	138	_
L3	30	-	30	-
L4	3	-	3	-
L5	90	-	90	-
L6	7	-	7	-
L7	20	-	20	-
L8	111	-	111	-
L9	15	-	15	-
L10	42	-	42	-
L11	96	-	96	-
C1 ²	235	-	235	-
C2 ²	M12x1.75P	-	M12x1.75P	-
C3 ²	<u>≤</u> 55	-	≦55	-
C4 ²	112	-	112	-
C5 ² _{F6}	200	-	200	-
C6 ²	6	-	6	-
C7 ²	220	-	220	-
C8 ²	120	-	120	-
C9 ²	369	-	369	-
В	20	-	20	-
Н	79.5	-	79.5	-

^{*2.} C1~C9 are motor specific dimensions (metric std shown). Sizes may vary according to the motor flange chosen.

 $[\]bigstar$ Specification subject to change without notice.



PGHA & PGHX Double Stage Dimensions



Specifications Unit:mm

Dimensions	PGHA220T	PGHA240T	PGHX220T	PGHX240T
D1	250	-	250	-
D2	17	-	17	-
D3 h6	75	-	75	-
D4 g6	180	-	180	-
D5	114.4	-	114.4	-
D6	M20x2.5P	-	M20x2.5P	-
D7	292	-	292	-
L1	220	-	220	-
L2	138	-	138	-
L3	30	-	30	-
L4	3	-	3	-
L5	90	-	90	-
L6	7	-	7	-
L7	20	-	20	-
L8	202	-	202	-
L9	15	-	15	-
L10	42	-	42	-
L11	74	-	74	-
C1 ²	200	-	200	-
C2 ²	M12x1.75P	-	M12x1.75P	-
C3 ²	<u>≤</u> 50	-	<u>≤</u> 50	-
C4 ²	81	-	81	-
C5 ² _{F6}	114.3	-	114.3	-
C6 ²	6	-	6	-
C7 ²	180	-	180	-
C8 ²	93	-	93	-
C9 ²	433	-	433	-
В	20	-	20	-
Н	79.5	-	79.5	-

^{*2.} C1~C9 are motor specific dimensions (metric std shown).



Sizes may vary according to the motor flange chosen.

 $[\]star$ Specification subject to change without notice.

PGHA & PGHX Specifications

PGHA-200 PGHA-200	C.	:£: +:		C+	D-4:-	DCITA 220	DCIIA 240	DCLLY 220	DCLLY 240	
Nominal Cutput Torque T _{anor} N + m Seed n _{ins} N + m	Specifications		Stage	Ratio	PGHA-220	PGHA-240	PGHX-220	PGHX-240		
Nominal Output Torque T _{2n}										
Precision Backlash P1										
Nominal Output Torque Tase N + m Fine Section Backlash PD Archinol Racklash PD Ar										
Nominal Output Torque T _{2A} N ⋅ m Single Ratio PGHA-220T PGHA-240T PGHA-240				1				2900	3900	
Nominal Output Torque T ₂₀₀ Nomin								_	_	
Nominal Output Torque T ₂₀₀					8		2400	-	<u>-</u>	
Nominal Output Torque T ₂₀₁ Nominal Output Torque T ₂₀₂ Nominal Output Torque T ₂₀₃ Nominal Output Torque T ₂₀₄ Nominal Output Torque T ₂₀₄ Nominal Output Torque T ₂₀₅ Nominal Output Torque T ₂₀₆ Nominal Output Torque T ₂₀₇ Nominal Output Torque T ₂₀₈ Nominal Output Torque T ₂₀₉ Nominal Output Torque								_		
Nominal Output Torque T _{2N}				Ctogo						
Nominal Output Torque T _{2N}				Stage			PGHA-2401		PGHX-2401	
Precision Backlash PQ	Naminal Out	nut Torque T					-		-	
Beach	Nominal Out	put forque 1 _{2N}	N • m							
Precision Backlash P1										
Remark										
A					35					
A				2	40	2200	3020	3020	4100	
So				_						
Stage Ratio Stage Rati										
Precision Backlash P1										
Service Life Part										
Service Life Ser										
Emergency Stop Torque T ₂₈₀₀₇ N ⋅ m N ⋅ m Torque T ₂₈₀₀₇ N ⋅ m N ⋅ m Torque T ₂₈₀₀₇ N ⋅ m Torque T ₂₈₀₀₇ N ⋅ m Torque T ₂₈₀₀₇							<u>-</u>	_		
Nominal Input Speed n _{1,max} N m rpm 1,2 3-100 2000 1500 2000 1500 2500								-	-	
Nominal Input Speed n					100	1600	2200	-	-	
Max. Input Speed n _{Imax} rpm 1,2 3-100 4000 2500 4000 2500 Micro Backlash P0 arcmin 1 3-10 ≤1 ≤3 ≤3 ≤3 ≤3 ≤3 ≤3 ≤3 ≤3 ≤3 ≤3 ≤3 ≤3 ≤5	Emergency Sto	op Torque T _{2NOT}	N•m		(* Max.	3.0 Times of Output Torque	Nominal Output T2B = 60% of Em	Torque) ergency Stop To	rque)	
Micro Backlash P0	Nominal Inp	out Speed n _{1N}	rpm	1,2	3-100	2000	1500	2000	1500	
Micro Backlash PO	Max. Input	Speed n _{1max}	rpm	1,2		4000	2500	4000	2500	
Micro Backlash P0				1	3-10	≦1	≦1	≦1	≦1	
Precision Backlash P1 arcmin 1 3-10 ≦3 ≦3 ≦3 ≦3 ≦3 ≦3 ≦3 ≦3 ≦3 ≦3 ≦3 ≦3 ≦5 55 ≤5 <t< td=""><td>Micro Ba</td><td>icklash P0</td><td>arcmin</td><td>2</td><td>15-100</td><td></td><td></td><td></td><td></td></t<>	Micro Ba	icklash P0	arcmin	2	15-100					
Precision Backlash P1										
Standard Backlash P2	Precision E	Backlash P1	arcmin							
Standard Backlash P2 arctini 2 15-100 ≤7 ≤7 ≤7 ≤7 ≤7										
Torsional Rigidity	Standard F	Racklach D2	arcmin							
Max. Radial Load F ₂₈ ¹ N	Standard	Dackiasii F2	arcillili	2	15-100	≦7	≦7	≦7	≦7	
Max. Axial Load F _{2a8} ¹ N 1,2 3-100 18530 27000 18530 27000 Operating Temp. °C 3-100 3-100 20,000 (10,000 Continuous Operation) Efficiency % 1 3-100 20,000 (10,000 Continuous Operation) Efficiency % 1 3-100 ≥ 97% Weight kg 1 3-10 57 - 58 - Mounting Position - 1,2 3-100 71.5 - 72.5 - Mounting Position - 1,2 3-100 70 72 70 72 Protection Class - 1,2 3-100 Synthetic Lubricant Inertia (J1) Stage Ratio unit PGHA-220 PGHA-240 PGHX-240 PGHX-240 53.98 - 53.98 - 54.36 - 54.12 - 54.12 - 54.12 - 53.98	Torsiona	al Rigidity	N • m /arcmin	1,2	3-100	350	500	460	650	
Operating Temp. °C 3-100 -10°C ~ +90°C Service Life hr 3-100 20,000 (10,000 Continuous Operation) Efficiency % 1 3-100 ≥97% Weight kg 1 3-10 57 - 58 - Wounting Position - 1,2 3-100 71.5 - 72.5 - Mounting Position - 1,2 3-100 70 72 70 72 Protection Class - 1,2 3-100 TP65 - 1	Max. Radia	al Load F _{2rB} 1	N	1,2	3-100	33000	46500	33000	46500	
Service Life hr 3-100 20,000 (10,000 Continuous Operation) Efficiency % 1 3-10 ≥ 97% Weight kg 1 3-10 57 - 58 - Mounting Position - 1,2 3-100 Any Direction Noise Level 2 dBA/1m 1,2 3-100 TO 72 70 72 Noise Level 2 dBA/1m 1,2 3-100 TO 72 70 72 Protection Class - 1,2 3-100 Synthetic Lubricant Inertia (J1) Stage Ratio PGHA-220 PGHA-240 PGHX-220 PGHX-240 Salar 53.98 - <th colspa<="" td=""><td>Max. Axia</td><td>I Load F_{2aB}1</td><td>N</td><td>1,2</td><td>3-100</td><td>18530</td><td>27000</td><td>18530</td><td>27000</td></th>	<td>Max. Axia</td> <td>I Load F_{2aB}1</td> <td>N</td> <td>1,2</td> <td>3-100</td> <td>18530</td> <td>27000</td> <td>18530</td> <td>27000</td>	Max. Axia	I Load F _{2aB} 1	N	1,2	3-100	18530	27000	18530	27000
Service Life	Operati	ng Temp.	°€		3-100		-10°C ~	+90°C		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Servi	ce Life	hr			20.0)	
Meight Meight	30.11			1		20,0			/	
Weight kg 1 3-10 57 - 58 - Mounting Position - 1,2 3-100 Any Direction Noise Level 2 dBA/1m 1,2 3-100 70 72 70 72 Protection Class - 1,2 3-100 Synthetic Lubricant Lubrication - 1,2 3-100 Synthetic Lubricant Stage Ratio unit PGHA-220 PGHA-240 PGHX-220 PGHX-240 1 5 58.21 - 58.21 - 6/7/8 54.36 - 54.36 - 9/10 53.98 - 53.98 - Stage Ratio PGHA-220T PGHA-240T PGHX-220T PGHX-240T 9/10 30.50 79.50 30.50 79.50 20/25/30/35/40 25.86 58.21 25.86 58.21	Effic	iency	%							
Noise Level 2 15-100 71.5 - 72.5 -						F7				
Mounting Position	We	eight	kg				-		-	
Noise Level ² dBA/1m 1,2 3-100 70 72 70 72 Protection Class - 1,2 3-100 Synthetic Lubricant Lubrication - 1,2 3-100 Synthetic Lubricant Inertia (J1) Stage Ratio unit PGHA-220 PGHA-240 PGHX-220 PGHX-240 5 4 79.50 - 79.50 - 58.21 - 58.21 - 58.21 - 6/7/8 54.36 - 54.36 - 54.12 - 54.12 - 53.98 - 53.98 - 53.98 - 53.98 - PGHA-240T PGHX-240T PGHX-240T <td< td=""><td></td><td></td><td>_</td><td></td><td></td><td>71.5</td><td>-</td><td></td><td>-</td></td<>			_			71.5	-		-	
Noise Level ² dBA/1m 1,2 3-100 70 72 70 72 Protection Class - 1,2 3-100 Synthetic Lubricant Lubrication - 1,2 3-100 Synthetic Lubricant Inertia (J1) Stage Ratio unit PGHA-220 PGHA-240 PGHX-220 PGHX-240 5 4 79.50 - 79.50 - 58.21 - 58.21 - 58.21 - 6/7/8 54.36 - 54.36 - 54.12 - 54.12 - 53.98 - 53.98 - 53.98 - PGHA-240T PGHX-220T PGHX-240T				1,2	3-100		Any Dir	ection		
Protection Class - 1,2 3-100 IP65 Lubrication - 1,2 3-100 Synthetic Lubricant Inertia (J1) Stage Ratio unit PGHA-220 PGHA-240 PGHX-220 PGHX-240 4 79.50 - 79.50 - 58.21 - 58.21 - 58.21 - 58.21 - 54.36 - 54.36 - 54.36 - 54.12 - 54.12 - 53.98 - 53.98 - 53.98 - FGHA-240T PGHX-220T PGHX-240T	Noise	Level 2	dBA/1m	1,2	3-100	70			72	
Lubrication - 1,2 3-100 Synthetic Lubricant Inertia (J1) Stage Ratio unit PGHA-220 PGHA-240 PGHX-220 PGHX-240 4 79.50 - 79.50 - 58.21 - 58.21 - 58.21 - 58.21 - 54.36 - 54.36 - 54.12 - 54.12 - 54.12 - 53.98 - 53.98 - 53.98 - 79.50	Protecti	ion Class	_							
Stage Ratio unit PGHA-220 PGHA-240 PGHX-220 PGHX-240 3										
Stage Ratio unit PGHA-220 PGHA-240 PGHX-220 PGHX-240 1 3 79.50 - 79.50 - 5 5 58.21 - 58.21 - 6/7/8 54.36 - 54.36 - 9/10 53.98 - 53.98 - Stage Ratio PGHA-220T PGHA-240T PGHX-220T PGHX-240T 2 20/25/30/35/40 30.50 79.50 30.50 79.50 25.86 58.21 25.86 58.21	Lubii	Cation	_	⊥,∠	J-100	Inertia (J1)	Synthetic L	unicani		
1 5 6/7/8 54.12 9/10 53.98 Stage Ratio 15 PGHA-220T PGHA-240T PGHX-220T PGHX-240T 2 20/25/30/35/40 30.50 79.50 30.50 79.50 2 25.86 58.21 25.86 58.21	Stage	Rati	0	unit			PGHA-240	PGHX-220	PGHX-240	
1 5 6/7/8 54.12 9/10 53.98 Stage Ratio 15 PGHA-220T PGHA-240T PGHX-220T PGHX-240T 2 20/25/30/35/40 30.50 79.50 30.50 79.50 2 25.86 58.21 25.86 58.21		3				79.50	_	79.50	_	
1 5 6/7/8 54.12 9/10 54.12 53.98 53.98 53.98 53.98 PGHA-220T PGHA-240T PGHX-220T PGHX-240T 30.50 79.50 30.50 79.50 2 20/25/30/35/40 25.86 58.21 25.86 58.21							-		-	
6/7/8 9/10 54.12 - 54.12 - 53.98 - 53.98 - 53.98 - PGHA-220T PGHA-240T PGHX-220T PGHX-240T 2 20/25/30/35/40 30.50 79.50 30.50 79.50 25.86 58.21 25.86 58.21	1						-		-	
Stage Ratio FGHA-220T PGHA-240T PGHX-220T PGHX-220T PGHX-240T 15 30.50 79.50 30.50 79.50 2 20/25/30/35/40 25.86 58.21 25.86 58.21			8							
Stage Ratio PGHA-220T PGHA-240T PGHX-220T PGHX-240T 15 30.50 79.50 30.50 79.50 2 20/25/30/35/40 25.86 58.21 25.86 58.21					Kg • cm²		_		_	
15 2 20/25/30/35/40 30.50 79.50 30.50 79.50 25.86 58.21 25.86 58.21	Ctaga				-		DCHV 340T		DCHX 240T	
2 20/25/30/35/40 25.86 58.21 25.86 58.21	Stage									
			/25 /40	—						
45/50/60/70/80/90/100 22.73 53.98 22.73 53.98	2									
		45/50/60/70/	80/90/10	00		22.73	53.98	22.73	53.98	

 $^{\,^{\}star}$ 1. Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.



^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio =

 $[\]ensuremath{\mathbb{X}}$ The above figures/specifications are subject to change without prior notice.

PGL

This most seller precision type planetary speed reducer is offering 3 precision levels and 7 frame sizes to choose. They are ready for most industry and motion control applications. Square mounting flange, caged precision class spur planetary gears in an in-line housing through sizes 220 mm. Years of manufacturing and generations improves bring high torque capacity, quiet operation and steady performance with backlash as low as < 3 arc-min. Ratios 3:1 to 100:1.





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PEE
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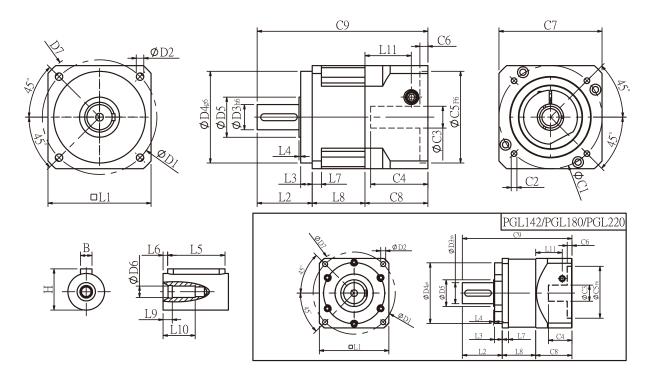
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Frame Size (mm)	42, 60, 90, 115, 142, 180, 220
Ratio	3:1-100:1
Nominal Input Speed (rpm)	2,000 -3,000
Max Input Speed (rpm)	4,000 - 6,000
Backlash (arc-min)	1 Stage : 3 - 12 2 Stages : 5 - 15
Noise Level (dBA / 1m)	60 - 75

Features

- ▶ In-line configuration with output shaft 13 mm through 75 mm diameter.
- ► Torque capacity range: 10 Nm through 1670 Nm.
- ► Caged planet carrier: with precision planet gear set.
- ► High performance, efficiencies and low acoustics.
- ► Wide range of ratios: 8 single stage ratios and up to 13 two-stage ratios.
- ▶ Output bearings deliver radial load capacity as high as 13500 N, and axial capacities up to 7300 N.
- ▶ Square servo and step motor input: accommodates 40 mm through 220 mm, with optional sizes available.

PGL Single Stage Dimensions



Specifications Unit:mm

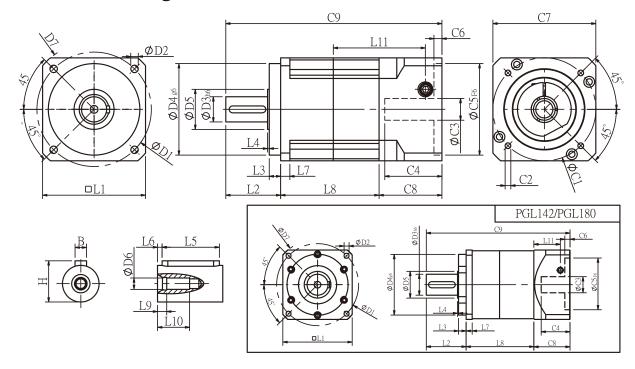
Dimensions	PGL42	PGL60	PGL90	PGL115	PGL142	PGL180	PGL220
D1	50	70	100	130	165	215	250
D2	3.4	5.5	6.5	8.5	10.5	13	17
D3h6	13	16	22	32	40	55	75
D4g6	35	50	80	110	130	160	180
D5	15	25	35	45	50	70	90
D6	M4x0.7P	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	56	80	118	148	186	239	292
L1	42.6	60	90	115	142	182	220
L2	26	37	48	62	93	104.5	138
L3	5.5	7	10	8	8	20	30
L4	1.5	1.5	1.5	3	6	2.5	3
L5	15	25	32	40	60	70	90
L6	2	2	3	5	5	6	7
L7	4	6	8	12	18	16	20
L8	28.3	36	46	59	79	87.5	117.5
L9	4	4	4.5	6	6	8	7
L10	14	16.5	20.5	30	38	48	42
L11	29	35.5	40.5	42	63	69.5	102.2
C1 ²	46	70	90	115	145	200	235
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P	M12x1.75P
C32	≦8	≦14	<u>≤</u> 19/ <u>≤</u> 24	<u>≤</u> 24/ <u>≤</u> 28	<u>≤</u> 35	<u>≤</u> 50	<u>≤</u> 55
C42	27	37	47	58	66	82	98
C5 ² _{F6}	30	50	70	95	110	114.3	200
C6 ²	4	4	6	10	6	13	12
C72	42.6	60	90	115	140	182	220
C8 ²	38.5	46	55	63	80	95	130
C9 ²	92.8	119	149	184	252	287	385.5
В	5	5	6	10	12	16	20
Н	15	18	24.5	35	43	59	79.5

 $[\]star$ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]star$ Specification subject to change without notice.



PGL Double Stage Dimensions-1



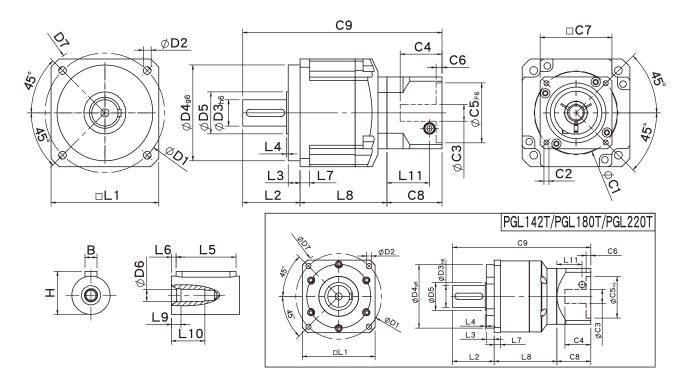
Specifications Unit:mm

Dimensions	PGL42	PGL60	PGL90	PGL115	PGL142	PGL180
D1	50	70	100	130	165	215
D2	3.4	5.5	6.5	8.5	10.5	13
D3h6	13	16	22	32	40	55
D4g6	35	50	80	110	130	160
D5	15	25	35	45	50	70
D6	M4x0.7P	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P
D7	56	80	118	148	186	239
L1	42.6	60	90	115	142	182
L2	26	37	48	62	93	104.5
L3	5.5	7	10	8	8	20
L4	1.5	1.5	1.5	3	6	2.5
L5	15	25	32	40	60	70
L6	2	2	3	5	5	6
L7	4	6	8	12	18	16
L8	54.3	64	86	107	140	177.5
L9	4	4	4.5 6		6	8
L10	14	16.5	20.2	30	38	48
L11	29	35.5	40.5	42	63	69.5
C1 ²	46	70	90	115	145	200
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 ²	≦8	<u>≤</u> 14	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 28	≦35	<u>≤</u> 50
C4 ²	27	37	47	58	66	82
C5 ² F6	30	50	70	95	110	114.3
C6 ²	4	4	6	10	6	13
C7 ²	42.6	60	90	115	140	182
C8 ²	38.5	46	55	63	80	95
C9 ²	118.8	147	189	232	313	377
В	5	5	6	10	12	16
Н	15	18	24.5	35	43	59

 $[\]star$ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

[★] Specification subject to change without notice.

PGL Double Stage Dimensions-2



Specifications Unit:mm

Dimensions	PGL60T	PGL90T	PGL115T	PGL142T	PGL180T	PGL220T
D1	70	100	130	165	215	250
D2	5.5	6.5	8.5	10.5	13	17
D3h6	16	22	32	40	55	75
D4g6	50	80	110	130	160	180
D5	25	35	45	50	70	90
D6	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	80	118	148	186	239	292
L1	60	90	115	142	182	220
L2	37	48	62	93	104.5	138
L3	7	10	8	8	20	30
L4	1.5	1.5	3	6	2.5	3
L5	25	32	40	60	70	90
L6	2	3	5	5	6	7
L7	6	8	15	18	16	20
L8	58.8	72.5	97.4	127	157	199.5
L9	4	4.5	6	6	8	7
L10	16.5	20.2	30	38	48	42
L11	29	35.5	40.5	42	63	69.5
C1 ²	46	70	90	115	145	200
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 ²	≦8	≦14	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 28	≦35	≦50
C4 ²	27	37	47	58	66	82
C5 ² F6	30	50	70	95	110	114.3
C6 ²	4	4	6	10	6	13
C7 ²	42.6	60	90	115	140	182
C8 ²	38.5	46	55	63	80	95
C92	134.3	166.5	214.4	283	341.5	432.5
В	5	6	10	12	16	20
Н	18	24.5	35	43	59	79.5

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]star$ Specification subject to change without notice.



PGL Specifications

Specifications		Stage	Ratio	PGL-42	PGL-60	PGL-90	PGL-115	PGL-142	PGL-180	PGL-220	
				3	13.8	44.2	95.2	283	482	1151	1670
				4	11.9	35.9	74.6	249	490	1055 1151	1574
			1	5	13.8 12.5	43.0 39.4	95.2 90.9	283 266	473 436	1055	1670 1574
				7	11.9	36.0	85.6	219	400	1055	1574
				8	10.9	32.4	85.0	216	363	860	1184
				9	9.8	28.7	80.0	210	320	764	1185
				10	10.1	25.0	75.0	210	320	763	1184
			Stage	Ratio	PGL-42	PGL-60 /60T	PGL-90 /90T	PGL-115 /115T	PGL-142 /142T	PGL-180 /180T	PGL-220 /220T
Naminal Output	Torous	NI ma		15	13.8	44.2	95.2	283	482	1151	1670
Nominal Output	. Torque T _{2N}	N•m		20	11.9	35.9	74.6	249	490	1055	1574 1670
				25 30	13.8 13.8	43.0 43.0	95.2 95.2	283 283	473 473	1151 1151	1670
				35	13.8	43.0	95.2	283	473	1151	1670
			2	40	13.8	43.0	95.2	283	473	1151	1670
				45 50	13.8	43.0	95.2 95.2	283	473	1151	1670
				60	13.8 12.5	43.0 39.4	95.2	283 266	473 436	1151 1055	1670 1574
				70	11.9	36.0	85.6	219	400	1055	1574
				80	10.9	32.4	85.0	216	363	860	1184
				90	9.8	28.7	80.0	210	320	764	1185
				100	10.1	25.0	75.0	210	320	763	1184
Emergency Stop T	orque T _{2NOT}	N•m			(*Ma	3.) ax. Output 1	0 times of N Torque T _{2B} =	lominal Out =60% of Em	put Torque ergency Sto) p Torque)	
Nominal Input S	Speed n _{in}	rpm	1,2	3-100	3000	3000	3000	2500	2000	2000	2000
Max. Input Spe	eed n _{1max}	rpm	1,2	3-100	6000	6000	6000	5000	4000	4000	4000
N4: D -	l- DO	arcmin	1	3-10	-	-	-	≦3	≦3	≦3	≦3
Micro Backl	ash PU	arciiiii	2	12-100	_	=	=	≦5	≦ 5	≦5	≦5
D D .	L L D1		1	3-10	_	≦6	≦6	<u>≤</u> 5	<u> </u>	<u> </u>	<u>≤</u> 5
Precision Back	Klash PI	arcmin	2	12-100	_	≦9	≦9	≦ 7	 ≦7	≦ 7	≦ 7
Standard Back	dach D2	arcmin	1	3-10	≦12	≦9	≦9	<u>≤</u> 7	<u>≤</u> 7	<u>≤</u> 7	≦7
Standard back	Clasti PZ	arcillili	2	12-100	≦15	≦12	≦12	≦ 9	<u>≤</u> 9	_ ≦9	≤9
Torsional Ri	igidity	N • m /arcmin	1,2	3-100	1.0	2.8	7.5	15.5	30	57	110
Max. Radial Lo	oad F _{2rB} ¹	N	1,2	3-100	450	1200	2050	4250	7680	9080	13500
Max. Axial Lo	ad F _{2aB} ¹	N	1,2	3-100	320	900	1420	2930	4680	5100	7300
Operating [*]	Temp.	°C		3-100	-10°C ~ +90°C						
Service	Service Life hr 3-100 20,000 (10,000 Continuous Operation)										
E(C		0,	1	3-10				≧96%			
Efficier	icy	%	2	12-100				≧92%			
\A/a:I	ht	1,	1	3-10	0.6	1.2	3.2	7.5	15.6	26	56
Weigl	it.	kg	2	12-100	0.8	1.9/1.5	5.3/3.6	12/8.8	20.7/17.2	36/31	80/62
Mounting Po	osition	_	1,2	3-100				Any directi			
Noise Le		dBA/1m	1,2	3-100	60	62	65	65	70	70	75
Protection		GD, VIIII	1,2	3-100	- 30			IP65	, ,		
		-		3-100							
Lubricat	Lubrication - 1,2						5)	ynthetic Lub	ricant		
					Inertia	(J1)					
Stage	Rat	tio	un	it	PGL-42	PGL-60	PGL-90	PGL-115	PGL-142	PGL-180	PGL-220
	3				0.03	0.20	0.81	2.20	7.89	25.2	77.9
	4				0.02	0.16	0.65	1.80	5.83	19.8	56.5
1 1	5				0.02	0.15	0.62	1.61	5.38	18.3	53.3
	6/7	'/8			0.02	0.14	0.60	1.55	5.22	17.8	53.0
	9/1		Kg ∙	cm ²	0.02	0.14	0.60	1.53	5.20	17.6	52.9
Stage	Rat				PGL-42	PGL-60(T)	PGL-90(T)	PGL-115(T)) PGL-142(T) PGL-180(T) PGL-220T
	15/20						0.62(0.15)	1.61(0.62)	5.38(1.61)	18.3(5.38)	
2	30/35					0.14(0.02)		1.55(0.60)	5.22(1.55)	17.8(5.22)	
)/80/90/100				0.14(0.02)		1.53(0.60)	5.20(1.53)		
* 1 Applied to the output shaft center at 100 rpm					(=:)						

^{* 1.} Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio = 100 (2-stage). XThe above figures/specifications are subject to change without prior notice.

PGLH

This precision type helical gear planetary gear reducer is offering 3 precision levels and 7 frame sizes to choose. They are ready for most industry and motion control applications. Square mounting flange, caged precision class helical planetary gears in an in-line housing through sizes 220 mm. High torque capacity, quiet operation with backlash as low as < 3 arc-min. Ratios 3:1 to 100:1. PGLH is designed to offer a consideration for achieving the desired goal at the most cost effective price.



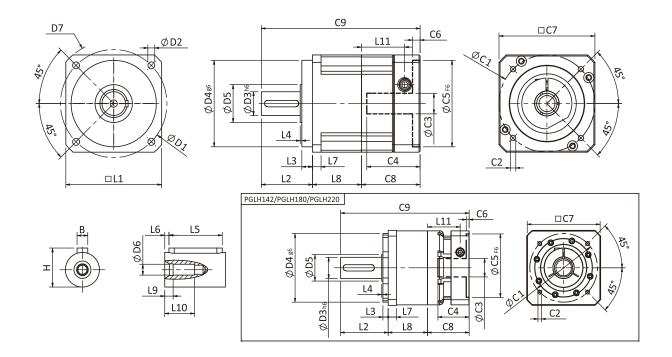


Frame Size (mm)	42, 60, 90, 115, 142, 180, 220
Ratio	3:1-100:1
Nominal Input Speed (rpm)	2,000 - 4,000
Max Input Speed (rpm)	3,000 - 8,000
Backlash (arc-min)	1 Stage : 3 - 8 2 Stages : 5 - 10
Noise Level (dBA / 1m)	58 - 72

Features

- ▶ In-line configuration with output shaft 13 mm through 75 mm diameter.
- ► Torque capacity range: 11 Nm through 2000 Nm.
- ► Caged planet carrier: with Precision Helical planet gear set.
- ► High performance, efficiencies and low acoustics.
- ▶ Wide range of ratios: 8 single stage ratios and up to 13 two-stage ratios.
- ▶ Output bearings deliver radial load capacity 28000 N, and axial capacities to 15000 N.
- ➤ Square servo and step motor input: accommodates 40 mm to 220 mm, with optional sizes available.

PGLH Single Stage Dimensions



Specifications Unit:mm

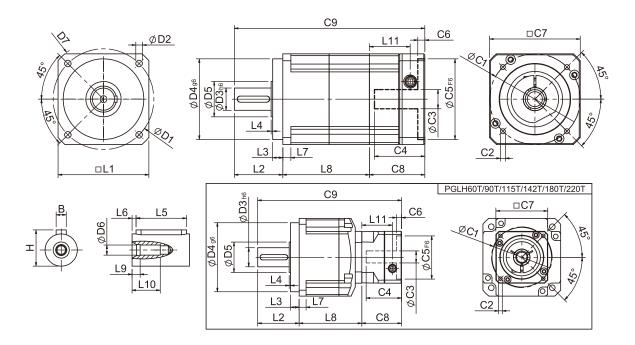
Dimensions	PGLH42	PGLH60	PGLH90	PGLH115	PGLH142	PGLH180	PGLH220
D1	50	70	100	130	165	215	215
D2	3.4	5.5	6.5	8.5	10.5	13	17
D3h6	13	16	22	32	40	55	75
D4 ₉ 6	35	50	80	110	130	160	180
D5	15	25	35	45	50	70	114.4
D6	M4x0.7P	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	56	80	118	148	186	239	292
L1	42.6	60	90	115	142	182	220
L2	26	37	48	63	91.5	100.5	138
L3	5.5	7	10	10	10	16	30
L4	1	1.5	1.5	3.5	2.5	2.5	3
L5	15	25	32	40	60	70	90
L6	2	2	3	5	5	6	7
L7	4	6	8	11	16	20	20
L8	28.3	37	46	57	75.5	94	111
L9	4	4	4.5	6	6	8	15
L10	14	16.5	20.5	30	38	48	42
L11	29	35.5	40.5	53.7	63	69.5	95
C1 ²	46	70	90	115	145	200	235
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P	M12x1.75P
C3 ²	≦8/≦14	<i>≦</i> 14/ <i>≦</i> 19	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 32/ <u>≤</u> 38	<u>≤</u> 35/ <u>≤</u> 38	≦50	≦55
C4 ²	27	37	41	56.3	66.5	82	112
C5 ² F6	30	50	70	95	110	114.3	200
C6 ²	4	4	6	10	5.5	13	6
C7 ²	42.6	60	90	115	140	182	220
C8 ²	38.5	46	55	75	80	95	120
C9 ²	92.8	120	149	195	247	289.5	369
В	5	5	6	10	12	16	20
Н	15	18	24.5	35	43	59	79.5

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]star$ Specification subject to change without notice.



PGLH Double Stage Dimensions



Specifications Unit:mm

						I			
Dimensions		PGLH60	PGLH60T	PGLH90	PGLH90T	PGLH115T	PGLH142T	PGLH180T	PGLH220T
D1	50		0		00	130	165	215	250
D2	3.4	5	.5	6		8.5	10.5	13	17
D3h6	13	1	6	2		32	40	55	75
D4 _{g6}	35	5	0	8	0	110	130	160	180
D5	15		5	3		45	50	70	114.4
D6	M4x0.7P	M5:	(0.8P	M8x	1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	56	8	0	1:	L8	148	186	239	292
L1	42.6	6	0		0	115	142	182	220
L2	26	3	7	4	8	63	91.5	100.5	138
L3	5.5	-	7	1	0	10	10	16	30
L4	1	1	.5	1	.5	3.5	2.5	2.5	3
L5	15	2	5	32		40	60	70	90
L6	2	2	2	3		5	5	6	7
L7	4	(5	8	3	11	16	20	20
L8	55.3	70	65.5	90	78.5	99.5	127.5	166	202
L9	4	4	1	4	.5	6	6	8	15
L10	14	16	5.5	20).5	30	38	48	42
L11	29	35.5	29	40.5	35.5	40.7	42	63	69.5
C1 ²	46	70	46	90	70	90	115	145	200
C2 ²	M4x0.7P	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 ²	<u>≤</u> 8/ <u>≤</u> 14	<u>≤</u> 14/ <u>≤</u> 19	<u>≤</u> 8/ <u>≤</u> 14	≦19/≦24	<u>≤</u> 14/ <u>≤</u> 19	≦19/≦24	<i>≦</i> 24/ <i>≦</i> 32/ <i>≦</i> 38	<u>≤</u> 35/ <u>≤</u> 38	<u>≤</u> 50
C4 ²	27	37	27	41	37	46	56	66.5	76
C5 ² _{F6}	30	50	30	70	50	70	95	110	114.3
C6 ²	4	4	4	6	4	10	10	5.5	6
C72	42.6	60	42.6	90	60	90	115	140	180
C8 ²	38.5	46	38.5	55	46	60	63	80	90
C9 ²	119.8	153	141	193	172.5	222.5	282	346.5	430
В	5	Į.	5	(5	10	12	16	20
Н	15	1	8	24	1.5	35	43	59	79.5

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.



 $[\]star$ Specification subject to change without notice.

PGLH Specifications

Spe	cifications	5	Stage	Ratio	PGLH-42	PGLH-60	PGLH-90	PGLH-115	PGLH-142	PGLH-180	PGLH-22		
				3	19	53	145	290	520	950	1100		
				4	20	55	150	300	550	1000	1700		
				5	17	54	140	290	530	1050	2000		
				6	15	46	135	280	490	1000	1850		
			1	7	14	44	125	270	450	960	1750		
				8	12	41	110	240	390	900	1550		
				9	11 11	37 37	95 95	220 220	360 360	800 800	1500		
			Stage	Ratio	PGLH-42	PGLH-60	PGLH-90		PGLH-142T		1450 PGLH-220		
Name in al Outrout To	Т	N•m		15	19	/60T 53	/90T 145	290	520	950	2000		
Nominal Output To	orque I _{2N}	14 • 111		20	20	55	150	300	550	1000	2000		
				25	17	54	140	290	530	1050	2000		
				30	17	54	140	290	530	1050	2000		
				35	17	54	140	290	530	1050	2000		
				40	17	54	140	290	530	1050	2000		
			2	45	17	54	140	290	530	1050	2000		
				50 60	17 15	54 46	140 135	290 280	530 490	1050	2000		
				70	14	44	125	270	450	1000 960	1850 1750		
				80	12	41	110	240	390	900	1550		
				90	11	37	95	220	360	800	1500		
				100	11	37	95	220	360	800	1450		
5 C: T	-							of Nominal Ou					
Emergency Stop To	rque T _{2NOT}	N•m				(*Max. O	utput Torque	$T_{2B} = 60\% \text{ of } E$	Emergency Sto	p Torque)			
Nominal Input Sp	eed n _{in}	rpm	1,2	3-100	4000	4000	3000	3000	2500	2500	2000		
Max. Input Spee	d n _{1max}	rpm	1,2	3-100	8000	8000	6000	6000	5000	4000	3000		
			1	3-10	<u>≤</u> 4	<u>≤</u> 4	<u>≤</u> 4	<u>≦</u> 3	≦3	<u>≤</u> 3	≦3		
Micro Backlas	h P0	arcmin	2	12-100	_ ≦6	_ ≦6	_ ≦6	 ≦5	 ≦5	 ≦5	 ≦5		
						3-10							
Precision Backla	ecision Backlash P1 arcmin		1 2	12-100	≦6	≦ 6	≦ 6	<u>≤</u> 5	≦ 5	<u>≦</u> 5	<u>≤</u> 5		
					≦8	<u>≤</u> 8	≦8	<u>≤</u> 7	<u>≦</u> 7	<u>≤</u> 7	<u>≦</u> 7		
Standard Backlash P2		arcmin	1	3-10	≦8	≦8	≦8	<u>≦</u> 7	<u>≦</u> 7	≦7	≦7		
		N•m	2	12-100	≦10	≦10	≦10	<u>≦</u> 9	<u>≦</u> 9	<u>≦</u> 9	≦9		
Torsional Rigi	dity	/arcmin	1,2	3-100	2.5	6	12	23	50	145	200		
Max. Radial Loa	d F _{2rB} ¹	N	1,2	3-100	640	1260	2230	4300	7140	11050	28000		
Max. Axial Load		N	1,2	3-100	410	600	1500	3310	4670	6460	15000		
Operating Te	mp.	°C		3-100				-10°C ~ +9	0°C				
Service Life	e	hr		3-100			20,000 (10,0	00 Continu	ous Operatio	on)			
Efficiency		0/	1	3-10				≥97%					
Emercincy		%	2	12-100				≧94%					
\A/=:=.l.(1	3-10	0.6	1.3	3.5	7.8	16.1	27	55		
Weight		kg	2	12-100	0.9	2.0(1.6)	5.6(3.9)	9.5	19	34	68.5		
Mounting Pos	ition	_	1,2	3-100		(2.0)		ny Direction			- 50.5		
		dD A /1			58	60	63	65	67	68	72		
Noise Level		dBA/1m	1,2	3-100	58	00	63		6/	00	12		
Protection CI	ass		1,2	3-100				IP65					
Lubrication	n	-	1,2	3-100			Sv	nthetic Lub	ricant				
		l	<u>'</u>	I.	I	Inertia							
Stage	Dod	tio	1.00	+	PGLH-42	PGLH-60	PGLH-90	PGLH-115	PGLH-142	PGLH-180	PGLH-22		
Stage	Rat		uni	t									
<u> </u>	3				0.03	0.23	0.97	2.35	10.00	30.50	79.50		
	4				0.02	0.18	0.67	1.66	7.17	25.86	58.21		
1	5				0.02	0.17	0.65	1.50	6.52	23.63	54.36		
	6/7	7/8		2	0.02	0.14	0.60	1.45	6.17	22.92	54.12		
	9/:	10	Kg ·	cm [*]	0.02	0.14	0.58	1.41	6.10	22.73	53.98		
Stage	Rat		1			PGLH-60(T)	PGLH-90(T)			PGLH-180T	PGLH-220		
9 0	15/20		1		0.02	0.17(0.02)	0.65(0.17)	0.65	1.50	6.52	23.63		
2	30/35		-		0.02	0.17(0.02)	0.60(0.14)	0.60	1.45	6.17	22.92		
	30/3				0.02	0.14(0.02)	0.58(0.14)	0.58	1.45		22.73		
	5/50/60/70	/ON /ON /1 ON								6.10			

 ^{* 1.} Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.



^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio = 100 (2-stage). **The above figures/specifications are subject to change without prior notice.

PGR

PGR series right angle planetary gearhead overall designs are suitable for combination operation with servo motor in high-speed input and achieve maximum torque output. Right angular design drastically reduces installation space. Precision gear design and gear processing create a planetary gearhead with low backlash operation, low noise, high efficiency and long service life performances.



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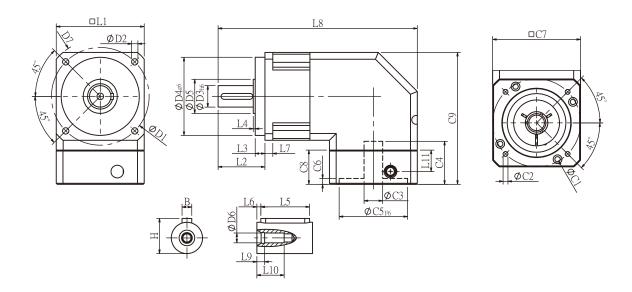
P

Frame Size (mm)	42, 60, 90, 115, 142
Ratio	3:1-100:1
Nominal Input Speed (rpm)	2,000 - 3,000
Max Input Speed (rpm)	4,000 - 6,000
Backlash (arc-min)	1 Stage : 4 - 12 2 Stages : 6 - 15
Noise Level (dBA / 1m)	65 - 75

Features

- ➤ 3 levels of backlash, 5 frame sizes from 42-142 mm.
- ▶ Premium and precision gear design, ratios from 3:1-100:1.
- ► One-piece planet carrier/output shaft, high rigidity and radial load capacity.
- ► Hardened and ground gearing, high wear resistance and impact toughness.
- ➤ One-piece ring gear/housing, high precision and torque output.
- ► Planets with full needle bearing support.
- ▶ IP65 enclosure and synthetic lubricant, maintenance-free service life.

PGR Single Stage Dimensions



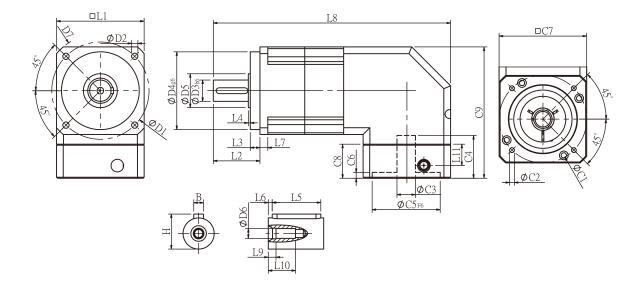
Specifications Unit:mm

Dimensions	PGR42	PGR60	PGR90	PGR115	PGR142
D1	50	70	100	130	165
D2	3.4	5.5	6.5	8.5	10.5
D3h6	13	16	22	32	40
D4g6	35	50	80	110	130
D5	15	25	35	45	50
D6	M4x0.7P	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P
D7	56	80	118	148	186
L1	42.6	60	90	115	142
L2	26	37	48	62	93
L3	5.5	7	10	8	8
L4	1.5	1.5	1.5	3	6
L5	15	25	32	40	60
L6	2	2	3	5	5
L7	4	6	8	12	18
L8	103.6	148.7	204	244.5	330
L9	4	4	4.5	6	6
L10	14	16.5	20.5	30	38
L11	13.5	21.5	22	32	44.7
C1 ²	46	70	90	115	145
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P
C3 ²	≦8/≦11	≦14/≦19	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 32	≦35
C4 ²	29	34	44	53	75
C5 ² _{F6}	30	50	70	95	110
C6 ²	6	5	5	6	9
C7 ²	42.6	60	90	115	140
C8 ²	25	33	35	48	65
C9 ²	70.8	107.8	135	174.5	207
В	5	5	6	10	12
Н	15	18	24.5	35	43

- \star C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.
- \star Specification subject to change without notice.



PGR Double Stage Dimensions-1



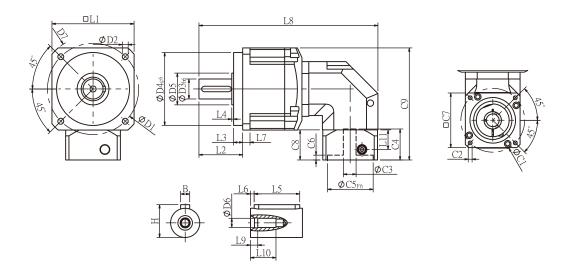
Specifications Unit:mm

Dimensions	PGR42	PGR60	PGR90	PGR115	PGR142
D1	50	70	100	130	165
D2	3.4	5.5	6.5	8.5	10.5
D3h6	13	16	22	32	40
D4g6	35	50	80	110	130
D5	15	25	35	45	50
D6	M4x0.7P	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P
D7	56	80	118	148	186
L1	42.6	60	90	115	142
L2	26	37	48	62	93
L3	5.5	7	10	8	8
L4	1.5	1.5	1.5	3	6
L5	15	25	32	40	60
L6	2	2	3	5	5
L7	4	6	8	12	18
L8	129.6	176.7	244	292.5	391
L9	4	4	4.5	6	6
L10	14	16.5	20.5	30	38
L11	13.5	21.5	22	32	44.7
C1 ²	46	70	90	115	145
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P
C3 ²	≦8/≦11	≦14/≦19	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 32	<u>≤</u> 35
C4 ²	29	34	44	53	75
C5 ² F6	30	50	70	95	110
C6 ²	6	5	5	6	9
C7 ²	42.6	60	90	115	140
C8 ²	25	33	35	48	65
C9 ²	70.8	107.8	135	174.5	207
В	5	5	6	10	12
Н	15	18	24.5	35	43

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

[★] Specification subject to change without notice.

PGR Double Stage Dimensions-2



Specifications

Unit:mm

Dimensions	PGR60T	PGR90T	PGR115T	PGR142T
D1	70	100	130	165
D2	5.5	6.5	8.5	10.5
D3h6	16	22	32	40
D4g6	50	80	110	130
D5	25	35	45	50
D6	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P
D7	80	118	148	186
L1	60	90	115	142
L2	37	48	62	93
L3	7	10	8	8
L4	1.5	1.5	3	6
L5	25	32	40	60
L6	2	3	5	5
L7	6	8	12	18
L8	145.1	196.2	269.4	343.5
L9	4	4.5	6	6
L10	16.5	20.2	30	38
L11	13.5	21.5	22	32
C1 ²	46	70	90	115
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P
C3 ²	≦8/≦11	≦14/≦19	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 32
C4 ²	29	34	44	53
C5 ² F6	30	50	70	95
C6 ²	6	5	5	6
C7 ²	42.6	60	90	115
C8 ²	25	33	35	48
C9 ²	79.5	122.8	147.5	188
В	5	6	10	12
Н	18	24.5	35	43

 $[\]star$ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]star$ Specification subject to change without notice.



PGR Specifications

Specifications		Stage	Ratio	PGR-42	PGR-60	PGR-90	PGR-115	PGR-142
			3	13.8	35.3	76.2	220	380
			4	11.9	35.9	74.6	249	450
			5	13.8	43.0	95.2	283	473
			6	12.5	39.4	90.9	220	420
		1	7	11.9	36.0	85.6	219	400
			8	10.9	32.4	85.0	216	363
			9	9.8	28.7	80.0	210	320
			10	13.8	43.0	95.2	260	473
		Stage	Ratio	PGR-42	PGR-60 /60T	PGR-90 /90T	PGR-115 /115T	PGR-142 /142T
	_		15	13.8	44.2	95.2	283	482
Nominal Output Torqu	ue T _{2N} N•r	n	20	11.9	35.9	74.6	249	490
			25	13.8	43.0	95.2	283	473
			30	13.8	43.0	95.2	283	473
			35	13.8	43.0	95.2	283	473
			40	13.8	43.0	95.2	283	473
		2	45	13.8	43.0	95.2	283	473
			50	13.8	43.0	95.2	283	473
			60	12.5	39.4	90.9	266	436
			70	11.9	36.0	85.6	219	400
			80	10.9	32.4	85.0	216	363
			90	9.8	28.7	80.0	210	320
			100	10.1	25.0	75.0	210	320
			100	10.1				320
Emergency Stop Torqu	ie T _{2NOT} N • m	1		(*Max. O	utput Torque T _{2B}	Nominal Outpu =60% of Emer	gency Stop Torq	ue)
Nominal Input Speed	d n _{in} rpm	1,2	3-100	3000	3000	3000	2500	2000
Max. Input Speed n	_{1max} rpm	1,2	3-100	6000	6000	6000	5000	4000
Micro Backlash P	0 arcm	in 1 2	3-10 12-100			-	≦4 ≦6	≦4 ≦6
Precision Backlash	D1	1	3-10	-	-	≦6	≦6	≦6
Precision backlash	arcm	in 2	12-100	_	-	≦9	≦8	≦8
Standard Backlash	D2	1	3-10	≦12	≦9	≦9	≦9	≦9
Standard backlasii	arcm	n 2	12-100	≦15	≦12	≦12	≦11	≦11
Torsional Rigidity	/ N • r		3-100	1.0	2.8	7.5	15.5	30
Max. Radial Load F	2rB N	1,2	3-100	350	960	1630	3380	6150
Max. Axial Load F ₂	taB ¹ N	1,2	3-100	320	900	1420	2930	5510
Operating Temp	. °C		3-100			-10°C~ +90°C		
Service Life	hr		3-100		20.000 (10	0,000 Continuo	us operation)	
Efficiency	%	1 2	3-10 12-100		20,000 (20	≥94% ≥90%	as operation,	
		1	3-10	1.0	2.5	6.5	13.2	24.6
Weight	kg	2	12-100	1.3	3.2/2.8	8.6/6.9	17.7/14.5	29.7/26.2
Mounting Positio	on l	1,2	3-100	1.5	5.2/2.0	Any direction	17.7/17.5	23.7/20.2
Noise Level ²			3-100	C F	67	70	70	75
	dBA/1			65	0/		70	/5
Protection Class -		1,2	3-100			IP65		
Lubrication - 1,		1,2	3-100	_	9	Synthetic Lubric	ant	
				Inertia (J1)				
Stage	Ratio	u	nit	PGR-42	PGR-60	PGR-90	PGR-115	PGR-142
	3/4/5/7/9			0.06	0.40	2.28	6.87	24.2
1	6/8/10		ļ	0.05	0.30	1.45	4.76	14.5
Stage	Ratio	Ka	cm ²	PGR-42	PGR-60(T)	PGR-90(T)	PGR-115(T)	PGR-142(T)
	15/20/25/35/	45	uii	0.06	0.40(0.08)	2.28(0.72)	6.87(3.02)	24.2(7.83)
2	others		ŀ	0.05	0.30(0.06)	1.45(0.38)	4.76(1.64)	14.5(5.00)
	001013			0.03	0.50(0.00)	1.73(0.30)	7.70(1.07)	17.5(3.00)

 $[\]ast$ 1. Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio = 100 (2-stage). XThe above figures/specifications are subject to change without prior notice.

PGRH

The PGRH Precision Series right-angle housing, square mounting flange, with caged precision class helical planetary gears, in sizes through 220 mm. High torque capacity, quiet operation and backlash as low as <2 arc-min. The square output flange makes it particularly easy to install and save spaces for a wide range of applications. PGRH series gearhead overall design suitable for combination operation with servo motor high-speed input and achieves maximum torque output. Precision gear design and gear processing create a planetary gearhead with low backlash operation, high efficiency, low noise and long service life performances.



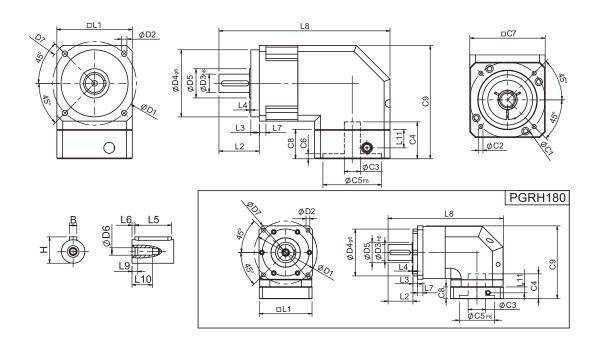
PAC

Frame Size (mm)	42, 60, 90, 115, 142, 180, 220
Ratio	3:1-200:1
Nominal Input Speed (rpm)	2,000 - 5,000
Max Input Speed (rpm)	4,000 - 10,000
Backlash (arc-min)	1 Stage : 2 - 7 2 Stages : 4 - 9
Noise Level (dBA / 1m)	62 - 74

Features

- ▶ 3 Levels of backlash, 7 frame sizes from 42-220 mm.
- ▶ Premium and precision gear design, ratios from 3:1-200:1.
- ► One-piece planet carrier/output shaft, high rigidity and radial load capacity.
- ► Hardened and ground gearing, high wear resistance and impact toughness.
- ➤ One-piece ring gear/housing, high precision and torque output.
- ▶ Planets with full needle bearing support.
- ▶ IP65 enclosure and synthetic lubricant, maintenance-free service life.

PGRH Single Stage Dimensions



Specifications Unit:mm

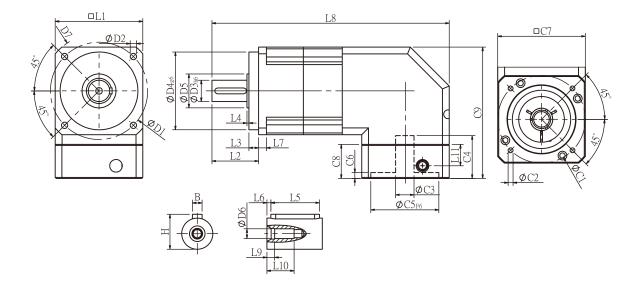
Dimensions	PGRH42	PGRH60	PGRH90	PGRH115	PGRH142	PGRH180	PGRH220
D1	50	70	100	130	165	215	250
D2	3.4	5.5	6.5	8.5	10.5	13	17
D3h6	13	16	22	32	40	55	75
D4g6	35	50	80	110	130	160	180
D5	15	25	35	45	50	70	114.4
D6	M4x0.7P	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	56	80	118	148	186	239	292
L1	42.6	60	90	115	142	182	220
L2	26	37	48	63	91.5	100.5	138
L3	5.5	7	10	10	10	16	30
L4	1	1.5	1.5	3.5	2.5	2.5	3
L5	15	25	32	40	60	70	90
L6	2	2	3	5	5	6	7
L7	4	6	8	11	16	18	20
L8	103.6	148.2	204	246.5	325	392.7	490.2
L9	4	4	4.5	6	6	8	15
L10	14	16.5	20.5	30	38	48	42
L11	13.5	21.5	22	32	44.7	20	60
C1 ²	46	70	90	115	145	200	215
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P	M12x1.75P
C3 ²	≦8/≦11	≦14/≦19	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 32	≦35	≦50	≦55
C4 ²	29	34	44	53	76.8	78.8	98.7
C5 ² _{F6}	30	50	70	95	110	114.3	180
C6 ²	6	5	5	6	9	6	6
C7 ²	42.6	60	90	115	140	182	220
C8 ²	25	33	35	48	65	40	85
C9 ²	70.8	107.8	135	174.5	207	248.5	287.5
В	5	5	6	10	12	16	20
Н	15	18	24.5	35	43	59	79.5

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]star$ Specification subject to change without notice.



PGRH Double Stage Dimensions-1



Specifications

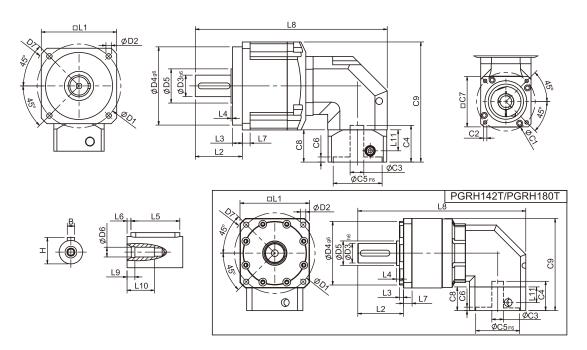
Unit:mm

Dimensions	PGRH42	PGRH60	PGRH90
DIMENSIONS D1	50	70	100
D2	3.4	5.5	6.5
D3h6	13	16	22
D4g6	35	50	80
D5	15	25	35
D6	M4x0.7P	M5x0.8P	M8x1.25P
D7	56	80	118
L1	42.6	60	90
L2	26	37	48
L3	5.5	7	10
L4	1	1.5	1.5
L5	15	25	32
L6	2	2	3
L7	4	6	8
L8	130.6	181.2	248
L9	4	4	4.5
L10	14	16.5	20.5
L11	13.5	21.5	22
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	≦8/≦11	≦14/≦19	≦19/≦24
C4 ²	29	34	44
C5 ² _{F6}	30	50	70
C6 ²	6	5	5
C7 ²	42.6	60	90
C8 ²	25	33	35
C9 ²	70.8	107.8	135
В	5	5	6
Н	15	18	24.5

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]star$ Specification subject to change without notice.

PGRH Double Stage Dimensions-2



Specifications Unit:mm

Dimensions	PGRH60T	PGRH90T	PGRH115T	PGRH142T	PGRH180T	PGRH220T
D1	70	100	130	165	215	250
D2	5.5	6.5	8.5	10.5	13	17
D3h6	16	22	32	40	55	75
D4g6	50	80	110	130	160	180
D5	25	35	45	50	70	114.4
D6	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	80	118	148	186	239	292
L1	60	90	115	142	182	220
L2	37	48	63	91.5	100.5	138
L3	7	10	10	10	16	30
L4	1.5	1.5	3.5	2.5	2.5	3
L5	25	32	40	60	70	90
L6	2	3	5	5	6	7
L7	6	8	11	16	18	20
L8	151.8	200.7	272.5	345.5	424.5	537.2
L9	4	4.5	6	6	8	15
L10	16.5	20.5	30	38	48	42
L11	13.5	21.5	22	32	44.7	44
C1 ²	46	70	90	115	145	200
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 ²	≦8/≦11	≦14/≦19	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 32	<u>≤</u> 35	≦50
C4 ²	29	34	45.2	53.5	76.8	78.8
C5 ² _{F6}	30	50	70	95	110	114.3
C6 ²	6	5	5	6	9	6
C72	42.6	60	90	115	140	180
C8 ²	25	33	35	48	65	65
C9 ²	79.5	122.8	147.5	188	207	267.5
В	5	6	10	12	16	20
Н	18	24.5	35	43	59	79.5

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]bigstar$ Specification subject to change without notice.



PGRH Specifications

Specification	ons	Stage	Ratio	PGRH-42	PGRH-60	PGRH-90	PGRH-115	PGRH-142	PGRH-180	PGRH-220
			3	10	40	95	200	380	750	950
			4	12	48	120	260	520	1000	1500
			5	15 18	60 55	150 150	325 310	600 560	1200 1100	2000 1900
		1	7	19	<u>55</u>	140	300	530	1100	1800
		1	8	17	45	120	260	480	1000	1600
			9	14	40	100	230	450	900	1500
			10	15	60	150	325	600	1200	2000
			14	14	50	140	300	530	1100	1800
			20	14	40	100	230	450	900	1500
		Stage	Ratio		PGRH-60(T)					
Nominal Output Torque	T _{2N} N•m		15	14	50	130	290	520	950	2000
			20	14	50	140	300	550	1000	2000
			25 30	15 19	60 55	150 150	325 310	600 600	1200	2000 1900
			35	19	55 50	140	300	550	1100 1100	1800
			40	17	45	120	260	500	1000	1600
			45	17	40	100	230	450	900	1500
		2	50	17	60	150	325	600	1200	2000
			60	20	55	150	310	600	1100	1900
			70	20	50	140	300	530	1100	1800
			80	20	45	120	260	480	1000	1600
			90	14	40	100	230	450	900	1500
			100	14	60	150	325	600	1200	2000
			120	17	55	150	310	560	1100	1900
			140	17	50	140	300	530	1100	1800
			160	14	45	120	260	480	1000	1600
			180	12	40	100	230	450	900	1500
			200	12	40	100	230	450	900	1500
Emergency Stop Torque	T_{2NOT} N·m				.) Max. Outp:(*	3.0 times of Nout Torque $T_{\scriptscriptstyle 2B}$	=60% of Eme	rgency Stop	Torque)	
Nominal Input Speed	n _{1N} rpm	1,2	3-200	5000	5000	4000	4000	3000	3000	2000
Max. Input Speed n _{1r}	_{max} rpm	1,2	3-200	10000	10000	8000	8000	6000	6000	4000
Micro Backlash P0	arcmin	1 2	3-20 15-200	-	-	≦ 3 ≦5	≦2 ≦4	≦2 ≤4	<u>≦</u> 2	≦2 ≦4
			3-20	≦ 5					<u>≦</u> 4	
Precision Backlash P	'1 arcmin	1 2	15-200	≦3 ≦7	≦ 5	≦ 5	≦4 ≦7	≦4 ≦7	<u>≤</u> 4	<u>≦</u> 4
			3-20	<u>≦</u> 7	<u>≤</u> 7	<u>≤</u> 7		<u> </u>	<u>≦</u> 7	<u>≦</u> 7
Standard Backlash P	² arcmin	1			≦ 7	≦ 7	<u>≤</u> 6	<u>≦</u> 6	<u>≦</u> 6	<u>≦</u> 6
	N.	2	15-200	≦9	≦9	≦9	≦9	≦9	<u>≦</u> 9	≦9
Torsional Rigidity	N· m /arcmin	1,2	3-200	3	7	14	25	50	145	225
Max. Radial Load F _{2rl}		1,2	3-200	760	1570	3250	6620	9400	14500	33000
Max. Axial Load F _{2aB}	N N	1,2	3-200	410	750	1870	3310	4670	6460	18530
Operating Temp.	°C		3-200			-1	L0°C ~ +90°	C		
Service Life	hr		3-200			20,000 (10,0			n)	
Efficiency	%	1	3-200			20,000 (10,0	≥95%	оиз ореган	311)	
,	70	2	15-200				≥92%			
Weight	kg	1	3-20	1.0	2.6	6.8	13.5	25.1	42	75
110.9	9	2	15-200	1.4	3.3/2.9	8.9/7.2	14.8	26.7	46	88
Mounting Position	-	1,2	3-200				Any Directio	n		
Noise Level ²	dBA/1m			61	62				72	7/
		1,2	3-200	61	63	65	68	70	72	74
Protection Class	-	1,2	3-200				IP65			
Lubrication	-	1,2	3-200			Svn	thetic Lubric	ant		
		· ·		Inertia (J	1)	- 7				
Ctoro	Datia		:+			DCDLL 00	DCDU 115	DCDLL 1.40	DCDLL 100	DCDLL 220
Stage	Stage Ratio un			PGRH-42	PGRH-60	PGRH-90	PGRH-115	PGRH-142	PGRH-180	
l 1	3/4/5/7/9			0.06	0.40	2.28	6.87	24.2	69.8	138.2
	6/8/10/14/20		า	0.05	0.30	1.45	4.76	14.5	50.3	103.6
Stage	Ratio	Kg	cm [∠]	PGRH-42	PGRH-60(T)	PGRH-90(T)	PGRH-115T	PGRH-142T	PGRH-180T	PGRH-220T
1	5/20/25/35/45	1		0.06	0.40(0.08)	2.28(0.72)	3.02	7.83	27.7	80.3
2	others	1		0.05	0.40(0.08)	1.45(0.38)	1.64	5.00	15.9	55.3
	OUICIS			0.05	0.50(0.08)	1.45(0.58)	1.04	5.00	15.9	55.5

^{* 1.} Applied to the output shaft center at 100 rpm.

 $Products\ due\ to\ human\ error,\ natural\ disasters\ or\ other\ factors\ lead\ to\ poor\ or\ damaged,\ will\ not\ be\ covered\ under\ warranty.$



^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio = 100 (2-stage). **The above figures/specifications are subject to change without prior notice.



PGRHX

High Rigidity Gearboxes



Big Frame Size

Large machine center super rigidity gearboxes, frame size 300 mm and above.

Extra High Output Torque

One-piece caged planetary gears carriers, high output torque and high positioning accuracy.

High Loading Capacity & Reliability

High radial load, service-life lubricant, maintenance-free, no downtime.

Direct Mounting

Customized motor bracket for all servo motors and DC motors.

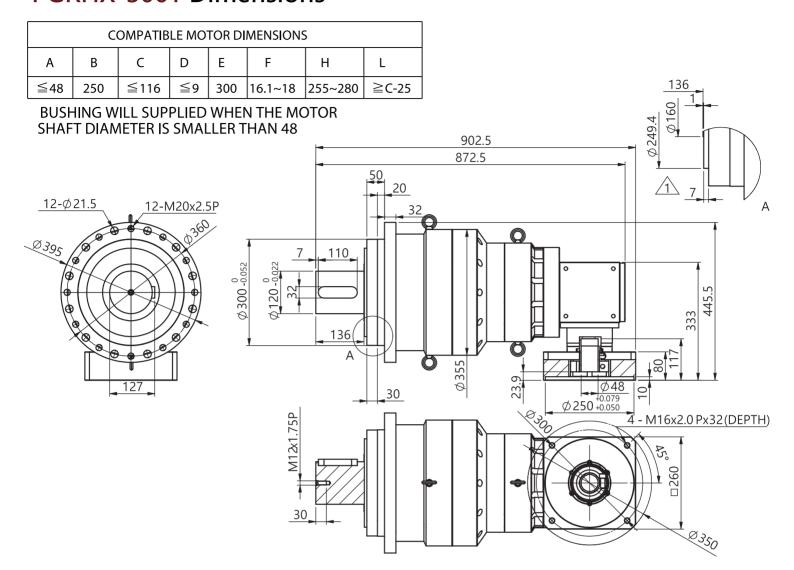
SESAME MOTOR CORP.

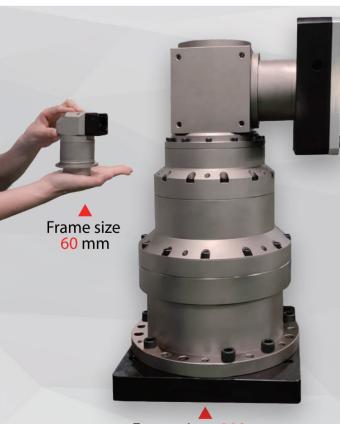
599, Sec1, Hemu Rd, Shengang, Taichung 42953, Taiwan TEL: +886-4-2561-0011 FAX: +886-4-2562-7766 info@sesamemotor.com.tw





PGRHX-300T Dimensions





Frame size >300 mm

SPECIFICATIONS

- P/N No.: PGRHX300T-100
- Nominal Output Torque: 11000 N·m
- Emergency Stop Torque: 3 time of Nominal Output Torque
- Max. Output Torque T2B = 60% of Emergency Stop Torque
- Nominal Input Speed: 2000 rpm
- Max. Input Speed: 3000 rpm
- Backlash: 3~7 arcmin
- Torsional Rigidity: 1800 N·m/arcmin
- Operating Temp.: -10°C~+90°C
- Service Life: 20000 hrs (Continuous Operation 10000 hrs)
- Efficiency: ≥88%
- Protection Class: IP 65 Max.



^{*} Specification subject to change without notice.

PGS

PGS in-line Planetary Gearheads are cost effective, compact and rigid gearboxes with standard backlash and maintenance-free operation in gantry robotics and packaging machineries. Series frame size 42 to 115 mm in square flange and round housing, ratios from 3:1 to 100:1. Low noise and low temperature rise, synthetic lubricant and high efficiency power transmission to provide solid performance. Compatible with servo motors, stepping motors and brushless DC motors.

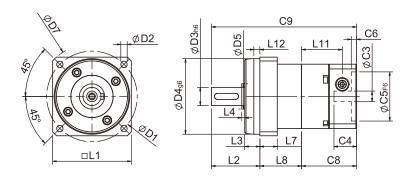


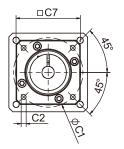
Frame Size (mm)	42, 60, 90, 115
Ratio	3:1 - 100:1
Nominal Input Speed (rpm)	2,500 - 4,000
Max Input Speed (rpm)	5,000 - 8,000
Backlash (arc-min)	1 stage: 6 - 9 2 stages: 8 - 12
Noise Level (dBA / 1m)	61 - 67

Features

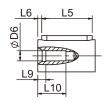
- ► In-line Configuration
- ➤ Output shaft, 12 mm through 32 mm diameter.
- ► Torque Capacity Range: 8 Nm through 260 Nm.
- ► Cantilevered Planet Carrier: with primary planet gear set.
- ► High performance, efficiencies and low acoustics.
- ▶ Wide Range of Ratios: 6 single stage ratios, 8 two stage ratios.
- ▶ Output Bearings deliver radial load capacity as high as 4600 N, and axial capacities up to 2950 N.
- ➤ Square Servo and Step Motor input: accommodates 40 mm through 100 mm, with optional sizes available.

PGS Single Stage Dimensions









Specifications

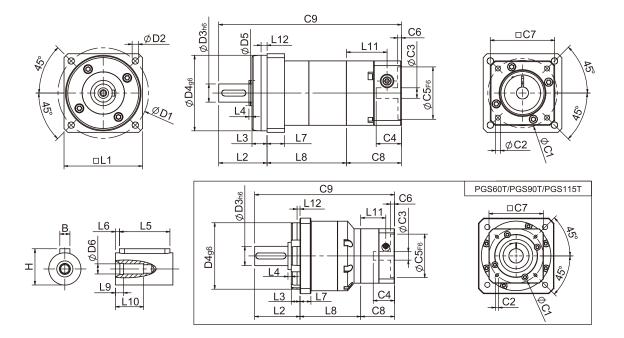
Unit:mm

Dimensions	PGS42	PGS60	PGS90	PGS115
DIMENSIONS D1	60	90	115	135
D2	M5x0.8P	M6x1.0P	M8x1.25P	M10x1.5P
D3h6	12	19	24	32
D4 ₉₆	50	70	90	110
D5	17	20	30	45
D6	M4x0.7P	M6x1.0P	M8x1.25P	M12x1.75P
D7	70	104	132	165
L1	52	78	98	125
L2	32	50	61	75
L3	10	17	18	14.5
L4	2	3	1.5	5.5
L5	16	25	32	40
L6	2	3	3	5
L7	11.5	15.4	18	18
L8	27.6	37.8	46.2	62.3
L9	4	4	4.5	6
L10	14	16.5	20.5	30
L11	26.9	34.3	41.55	51.5
L12	3	4	5	5
C1 ²	46	70	90	145
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P
C3 ²	≦8/≦11	<i>≦</i> 14/ <i>≦</i> 19	≦19/≦24/≦28	<u>≤</u> 24/ <u>≤</u> 32/ <u>≤</u> 38
C4 ²	26.5	33.5	41	51.5
C5 ² F6	30	50	70	110
C6 ²	4	4	6	6
C7 ²	42.6	60	90	130
C8 ²	36.4	44.8	55.8	68
C9 ²	96	132.6	163	205.3
В	4	6	8	10
Н	13.5	21.5	27	35

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]star$ Specification subject to change without notice.

PGS Double Stage Dimensions



Specifications Unit:mm

Dimensions	PGS42	PGS60	PGS60T	PGS90	PGS90T	PGS115T	
D1	60	90		13	115		
D2	M5x0.8P	M6x1.0P		M8x1.25P		M10x1.5P	
D3h6	12	1	.9	2	4	32	
D4 _{g6}	50	7	0	9	0	110	
D5	17	20		3	45		
D6	M4x0.7P	M6>	(1.0P	M8x2	M8x1.25P		
D7	70	10	04	13	32	165	
L1	52	7	'8	9	8	125	
L2	32	5	50	6	1	75	
L3	10	1	.7	1	8	14.5	
L4	2		3	1	.5	5.5	
L5	16	2	?5	32		40	
L6	2		3	3		5	
L7	11.5	1!	15.4		18		
L8	52.5	68.5	64.1	87.2	76.7	100.4	
L9	4	4		4	.5	6	
L10	14	16.5		20	20.5		
L11	51.8	34.3 26.9		41.55	34.3	41.55	
L12	3		4	Ţ	5	5	
C1 ²	46	70	46	90	70	90	
C2 ²	M4x0.7P	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P	M6x1.0P	
C3 ²	≦8/≦11	≦14/≦19	≦8/≦11	≦19/≦24/≦28	≦14/≦19	≦19/≦24/≦28	
C4 ²	26.5	33.5	26.5	41	33.5	41	
C5 ² F6	30	50	30	70	50	70	
C6 ²	4	4	4	6	4	6	
C7 ²	42.6	60	42.6	90	60	90	
C8 ²	36.4	44.8	36.4	55.8	44.8	55.8	
C9 ²	120.9	163.3	-	204	182.5	231.2	
В	4		6	3	10 35		
Н	13.5	2.	21.5		27		

 $[\]star$ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]star$ Specification subject to change without notice.

PGS Specifications

Nominal Cutput Torque Tay N-m N-m Stage Max. Input Speed ntm primal Input Speed ntm	Specifications		Stage	Ratio	PGS42	PGS60	PGS90	PGS115
Nominal Output Torque T _{NV}				3	9	28	85	210
Nominal Output Torque T _{are} N-m Table N-m Table				4	10	32	80	240
Nominal Output Torque T _{are} N-m Table N-m Table			1	5	11	35	95	260
Nominal Output Torque T _{2H}								
Nominal Output Torque T ₂₀₀ Nominal Output Torque T ₂₀₀								
Nominal Output Torque T _{2N} N-m N-m N-m N-m N-m N-m N-m N-								
Nominal Output Torque Table Name								
Part		_	Stage	Ratio	PGS42			PGS115T
Part	Nominal Output Torqu	e I _{2N} N•m		15	11		90	230
2				20	10	32	80	240
Part				25	11	35	95	260
Max. Input Speed n _{trax} Property Pro				35	11	35	95	260
Figure Figure			2	45	11	35	95	260
Figure Figure				49	10	28	85	260
Ba1 8 23 75 210 2								
Emergency Stop Torque T _{JNOT}								
Nominal Input Speed n _{1N}								
Nominal Input Speed n				100				190
Max. Input Speed n Inmax rpm 1,2 3-100 8000 6000 6000 5000 Standard Backlash P2 arcmin 1/2 3-100 ≤9 ≤8 ≤7 ≤6 ≤8 57 ≤6 ≤8 57 ≤6 ≤8 57 ≤6 ≤8 57 ≤6 ≤8 57 ≤6 ≤8 57 ≤6 ≤8 57 ≤6 ≤8 57 ≤6 ≤8 57 ≤6 ≤8 57 ≤6 ≤8 57 ≤6 ≤8 57 ≤6 ≤8 57 ≤6 ≤8 57 ≤6 ≤8 57 ≤6 ≤8 57 ≤6 ≤8 57 ≤6 ≤8 57 ≤8 ≤8 57 ≤6 ≤8 57 ≤8 ≤8 57 ≤6 <600	Emergency Stop Torque	T _{2NOT} N∙m		(*N	3.0 t ax. Output Tord	gimes of Nominal C que T_{2B} = 60% of En	nergency Stop To	orque)
Standard Backlash P2 arcmin 1 3-10 ≤9 ≤12 ≤10 ≤9 ≤8 ≤7 ≤6 ≤8 Torsional Rigidity N·m / Arcmin 1,2 3-100 1.5 4.0 8.5 17 Max. Radial Load F_{2n}^{-1} N 1,2 3-100 1120 1720 2800 4600 Max. Axial Load F_{2n}^{-1} N 1,2 3-100 520 830 1730 2950 Operating Temp. °C 1,2 3-100 520 830 1730 2950 Service Life hr 1,2 3-100 20,000 (10,000 Continuous Operation) 1 Efficiency % 1 3-10 295% 295% Weight kg 1 3-10 295% 3.4 7.8 Mounting Position - 1,2 3-100 61 63 66 67 Protection Class - 1,2 3-100 61 63 66 67 Protection Class - 1,2 3-100 Synthetic Lub	Nominal Input Speed	n _{1N} rpm	1,2	3-100	4000	4000	3000	2500
Standard Backlash P2 arcmin 2 15-100 s12 s10 s9 s8	Max. Input Speed n ₁	_{max} rpm	1,2	3-100	8000	6000	6000	5000
Torsional Rigidity	Ctondond Doddonb F	arcmin	1	3-10	<u>≤</u> 9	≦8	<u>≤</u> 7	<u>≤</u> 6
Max. Radial Load F _{2x8} ¹ N	Standard Backlash F	arcillin	2	15-100	≦12	≦10	≦ 9	≦ 8
Max. Axial Load F_{2a8}^{-1} N 1,2 3-100 520 830 1730 2950 Operating Temp. °C 1,2 3-100 20,000 (10,000 Continuous Operation) Service Life hr 1,2 3-100 20,000 (10,000 Continuous Operation) Efficiency % 1 3-10 ≥ 95% Weight kg 1 3-10 0.6 1.5 3.4 7.8 Weight kg 1 3-10 0.6 1.5 3.4 7.8 Mounting Position - 1,2 3-100 Any Direction Noise Level ² dBA/1m 1,2 3-100 61 63 66 67 Protection Class - 1,2 3-100 Synthetic Lubricant Inertia (J1) Stage Ratio unit PGS42(φ8) PGS60(φ14) PGS90(φ19) PGS115(φ24) A 0.03 0.21 0.60 1.65 0.03 0.21 0.60 1.65	Torsional Rigidity		1,2	3-100	1.5	4.0	8.5 17	
Operating Temp. °C 1,2 3-100 3-10°C ~ +90°C	Max. Radial Load F ₂₁	_B ¹ N	1,2	3-100	1120 1720 2800 460		4600	
Service Life hr 1,2 3-100 20,000 (10,000 Continuous Operation) Efficiency % 1 3-10 15-100 ≥ 95% ≥ 90% Weight kg 1 3-10 0.6 1.5 3.4 5.1/4.0 7.8 5.1/4.0 Mounting Position - 1,2 3-100 Any Direction Noise Level ² dBA/1m 1,2 3-100 61 63 66 67 Protection Class - 1,2 3-100 Synthetic Lubricant Lubrication - 1,2 3-100 Synthetic Lubricant Inertia (J1) Stage Ratio unit PGS42(ф8) PGS60(ф14) PGS90(ф19) PGS115(ф24) 4 0.03 0.21 0.61 1.71 5 9/10 0.03 0.21 0.60 1.63 Stage Ratio kg•cm² PGS42(ф8) PGS60(ф14)/PGS90(ф19)/PGS90(ф19)/PGS90(ф19)/PGS907(ф14) PGS90(ф19)/PGS907(ф14) PGS90(ф19)/PGS907(ф14) PGS90(ф19)/PGS907(ф14) PGS90(ф19)/PGS907(ф14) PGS90(ф	Max. Axial Load F _{2at}	N N	1,2	3-100	520	830	1730	2950
Efficiency % 1 / 2 / 15-100 $\frac{2}{90\%}$ Weight kg 1 / 2 / 15-100 0.6 / 0.9 / 2.0/1.8 1.5 / 3.4 / 7.8 / 5.1/4.0 7.8 / 9.5 Mounting Position - 1,2 / 3-100 Any Direction Noise Level 2 / 0dBA/1m 1,2 / 3-100 61 / 63 / 66 / 67 Protection Class - 1,2 / 3-100 Synthetic Lubricant Lubrication - 1,2 / 3-100 Synthetic Lubricant Inertia (J1) Stage Ratio unit PGS42(ф8) PGS60(ф14) PGS90(ф19) PGS115(ф24) 1 5 0.04 0.23 0.77 2.30 0.03 0.21 0.67 1.92 0.03 0.21 0.67 1.92 0.03 0.21 0.60 1.65 0.03 0.21 0.60 1.65 0.03 0.21 0.60 1.65 0.03 0.21 0.60 1.63 0.03 0.21 (0.03) 0.61 (0.21) PGS907(φ19)	Operating Temp.	°C	1,2	3-100	-10°C ~ +90°C			
Weight Mag	Service Life	hr	1,2	3-100		20,000 (10,000 Co	ntinuous Operati	ion)
Weight kg 1 / 2 / 2 / 15-100 15-100 / 15-100 0.6 / 1.5 / 1.5 / 3.4 / 7.8 / 3.4 / 7.8 / 5.1/4.0 Mounting Position - 1,2 / 3-100 Any Direction Noise Level ² dBA/1m / 1,2 / 3-100 61 / 63 / 66 / 67 Protection Class - 1,2 / 3-100 TP65 Lubrication - 1,2 / 3-100 Synthetic Lubricant Inertia (J1) Stage Ratio unit PGS42(ф8) PGS60(ф14) PGS90(ф19) PGS115(ф24) 1 5 0.04 0.23 0.77 2.30 0.03 0.21 0.67 1.92 0.03 0.21 0.60 1.65 0.03 0.21 0.60 1.65 0.03 0.21 0.60 1.65 0.03 0.21 (0.03) 0.61 (0.21) 0.61 2 35/49 0.03 0.21 (0.03) 0.61 (0.21) 0.60	Efficiency	0/	1	3-10		≥ 9	95%	
Weight kg 2 15-100 0.9 2.0/1.8 5.1/4.0 9.5 Mounting Position - 1,2 3-100 Any Direction Noise Level ² dBA/1m 1,2 3-100 61 63 66 67 Protection Class - 1,2 3-100 Synthetic Lubricant Lubrication - 1,2 3-100 Synthetic Lubricant Inertia (J1) Stage Ratio unit PGS42(ф8) PGS60(ф14) PGS90(ф19) PGS115(ф24) 1 5 0.04 0.23 0.77 2.30 0.03 0.21 0.67 1.92 0.03 0.21 0.61 1.71 0.03 0.21 0.60 1.63 Stage Ratio kg •cm² PGS42(ф8) PGS60(ф14)/PGS90(ф19)/PGS90(ф19)/PGS90(ф19)/PGS90(ф19)/PGS90(ф19)/PGS90(ф14) PGS115T(ф19) 2 35/49 0.03 0.21 (0.03) 0.21 (0.03) 0.60 (0.21) 0.60 </td <td>Linciency</td> <td>/0</td> <td>2</td> <td>15-100</td> <td></td> <td>≧ 9</td> <td>90%</td> <td></td>	Linciency	/0	2	15-100		≧ 9	90%	
Noise Level ² dBA/1m 1,2 3-100 61 63 66 67 Protection Class - 1,2 3-100 IP65 Lubrication - 1,2 3-100 Synthetic Lubricant Inertia (J1) Stage Ratio unit PGS42(φ8) PGS60(φ14) PGS90(φ19) PGS115(φ24) 1 3 0.04 0.23 0.77 2.30 0.03 0.21 0.67 1.92 0.03 0.21 0.60 1.65 9/10 0.03 0.21 0.60 1.63 Stage Ratio kg • cm² PGS42(φ8) PGS60(φ14)/PGS60T(φ8) PGS90(φ19)/PGS90T(φ14) PGS115T(φ19) 2 35/49 0.03 0.21 (0.03) 0.61 (0.21) 0.61	Weight	kg	1 2					
Noise Level ² dBA/1m 1,2 3-100 61 63 66 67 Protection Class - 1,2 3-100 IP65 Lubrication - 1,2 3-100 Synthetic Lubricant Inertia (J1) Stage Ratio unit PGS42(φ8) PGS60(φ14) PGS90(φ19) PGS115(φ24) 1 3 0.04 0.23 0.77 2.30 0.03 0.21 0.67 1.92 0.03 0.21 0.60 1.65 9/10 0.03 0.21 0.60 1.63 Stage Ratio kg • cm² PGS42(φ8) PGS60(φ14)/PGS60T(φ8) PGS90(φ19)/PGS90T(φ14) PGS115T(φ19) 2 35/49 0.03 0.21 (0.03) 0.61 (0.21) 0.61	Mounting Position	-	1.2	3-100		Any D	irection	
Protection Class - 1,2 3-100 IP65 Lubrication - 1,2 3-100 Synthetic Lubricant Inertia (J1) Stage Ratio unit PGS42(φ8) PGS60(φ14) PGS90(φ19) PGS115(φ24) 3 0.04 0.23 0.77 2.30 4 0.03 0.21 0.67 1.92 0.03 0.21 0.61 1.71 7 0.03 0.21 0.60 1.65 9/10 0.03 0.21 0.60 1.63 Stage Ratio kg •cm² PGS42(φ8) PGS60(φ14)/PGS60T(φ8) PGS90(φ19)/PGS90T(φ14) PGS115T(φ19) 0.03 0.21 (0.03) 0.61 (0.21) 0.61<				+	61			67
Lubrication - 1,2 3-100 Synthetic Lubricant Inertia (J1) Stage Ratio unit PGS42(φ8) PGS60(φ14) PGS90(φ19) PGS115(φ24) 3 0.04 0.23 0.77 2.30 4 0.03 0.21 0.67 1.92 0.03 0.21 0.61 1.71 7 0.03 0.21 0.60 1.65 9/10 0.03 0.21 0.60 1.63 Stage Ratio kg•cm² PGS42(φ8) PGS60(φ14)/PGS60T(φ8) PGS90(φ19)/PGS90T(φ14) PGS115T(φ19) 2 35/49 0.03 0.21 (0.03) 0.61 (0.21) 0.61					01			07
Inertia (J1) Stage Ratio unit PGS42(φ8) PGS60(φ14) PGS90(φ19) PGS115(φ24) 3 0.04 0.23 0.77 2.30 4 0.03 0.21 0.67 1.92 0.03 0.21 0.61 1.71 7 0.03 0.21 0.60 1.65 9/10 0.03 0.21 0.60 1.63 Stage Ratio kg•cm² PGS42(φ8) PGS60(φ14)/PGS60T(φ14)/PGS90T(φ14) PGS90T(φ14)/PGS90T(φ14) PGS115T(φ19) 2 35/49 0.03 0.21 (0.03) 0.61 (0.21) 0.61								
Stage Ratio unit PGS42(φ8) PGS60(φ14) PGS90(φ19) PGS115(φ24) 3 0.04 0.23 0.77 2.30 4 0.03 0.21 0.67 1.92 0.03 0.21 0.61 1.71 7 0.03 0.21 0.60 1.65 9/10 0.03 0.21 0.60 1.63 Stage Ratio kg•cm² PGS42(φ8) PGS60(φ14)/PGS60T(φ8) PGS90(φ19)/PGS90T(φ14) PGS115T(φ19) 2 35/49 0.03 0.21 (0.03) 0.61 (0.21) 0.61	Lubrication		1,2		(12)	Syntneti	c Lubricant	
3					. ,			
1	Stage			unit			· · · · · ·	
1 5								
7 9/10 Stage Ratio Ratio kg•cm² PGS42(φ8) PGS60(φ14)/ PGS90(φ19)/ PGS90T(φ14) PGS90T(φ14) 15/20/25 0.03 0.21 0.60 1.63 PGS90T(φ14) PGS90T(φ14) PGS90T(φ14) PGS90T(φ14) 0.03 0.21 (0.03) 0.61 (0.21) 0.61 0.03 0.21 (0.03) 0.60 (0.21) 0.60								
9/10 Stage Ratio kg•cm² PGS42(φ8) PGS60(φ14)/ PGS90(φ19)/ PGS90T(φ14) 15/20/25 2 35/49 Ratio 0.03 0.21 0.60 1.63 PGS42(φ8) PGS60T(φ8) PGS90T(φ14) PGS115T(φ19) 0.03 0.21 (0.03) 0.61 (0.21) 0.61 0.03 0.21 (0.03) 0.60 (0.21) 0.60	1							
Stage Ratio kg•cm² PGS42(ф8) PGS60(ф14)/PGS60T(ф8) PGS90(ф19)/PGS90T(ф19) PGS115T(ф19) 15/20/25 0.03 0.21 (0.03) 0.61 (0.21) 0.61 2 35/49 0.03 0.21 (0.03) 0.60 (0.21) 0.60								
15/20/25 0.03 0.21 (0.03) 0.61 (0.21) 0.61 2 35/49 0.03 0.21 (0.03) 0.60 (0.21) 0.60	Stage			kg•cm²		PGS60(φ14)/	PGS90(φ19)/	
2 35/49 0.03 0.21 (0.03) 0.60 (0.21) 0.60		15/20/25			0.03	,,,,		0.61
	2							
	_		0					

^{* 1.} Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.



^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio =

^{**}The above figures/specifications are subject to change without prior notice.

PGSH

PGSH in-line planetary gearheads provide integration between superior operating performance and cost effectiveness. One-piece planet carrier/output shaft and newly designed gear profile benefit higher output torque, precision, loading capacity and lower noise level. High quality gears and components are utilized to create compact and rigid unit with low backlash and maintenance-free operation. 2 levels of precision are available with max frame size 142 mm. Adapters for all servo motors.

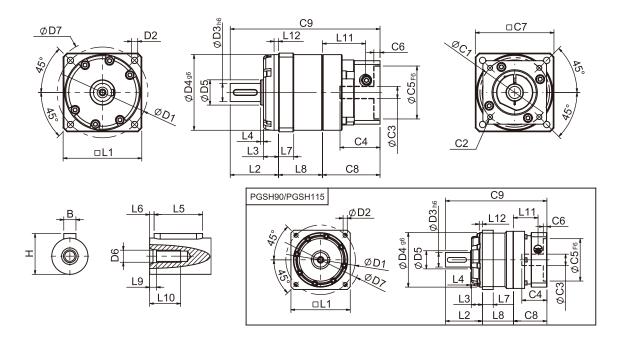


Frame Size (mm)	42, 60, 90, 115, 142
Ratio	3:1-100:1
Nominal Input Speed (rpm)	2,500 - 4,000
Max Input Speed (rpm)	5,000 - 8,000
Backlash (arc-min)	1 Stage : 5 - 8 2 Stages : 7 - 10
Noise Level (dBA / 1m)	58 - 67

Features

- ▶ One-piece planet carrier/output shaft, high torsional rigidity and loading capacity.
- ➤ One-piece compact ring gear design, high precision and output torque.
- ► Alloy steel precision gears, low backlash, low noise, high wear resistance.
- ► Lubricated for life and IP65 sealing, maintenance free.
- ► Adapters for all servo motors.

PGSH Single Stage Dimensions



Specifications

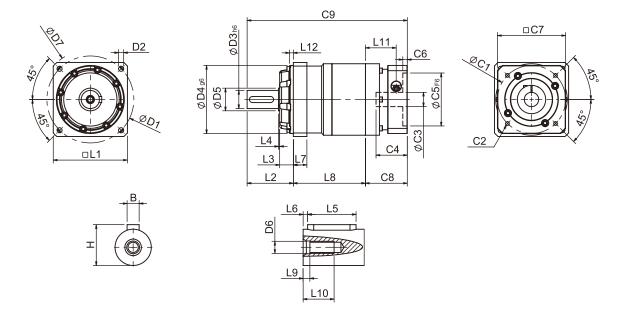
	I			I
Dimensions	PGSH42	PGSH60	PGSH90	PGSH115
D1	60	90	115	135
D2	M5x0.8P	M6x1.0P	M8x1.25P	M10x1.5P
D3h6	12	19	24	32
D4 ₉₆	50	70	90	110
D5	16.7	20	30	45
D6	M4x0.7P	M6x1.0P	M8x1.25P	M12x1.75P
D7	70	104	132	164
L1	52	78	98	120
L2	32	50	61	75
L3	10	17	18	14.5
L4	2	3	1.5	5.5
L5	16	25	32	40
L6	2	3	3	5
L7	10	12	18	18.5
L8	29	37.8	51.4	63.8
L9	4	4	4.5	6
L10	12	16.5	20.5	30
L11	28.5	35.5	40.7	53.8
L12	3	4	5	5
C1 ²	46	70	90	115
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P
C3 ²	≦8/≦11	<u>≤</u> 14/ <u>≤</u> 19	<i>≦</i> 19/ <i>≦</i> 24	<u>≤</u> 24/ <u>≤</u> 32/ <u>≤</u> 38
C4 ²	26.5	37.6	41.4	51.3
C5 ² F6	30	50	70	95
C6 ²	4.1	4.5	6	6
C7 ²	42	60	90	115
C8 ²	38.1	46.5	55.4	70
C9 ²	99.1	134.3	167.8	208.8
В	4	6	8	10
Н	13.5	21.5	27	35

 $[\]star$ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]bigstar$ Specification subject to change without notice.



PGSH Double Stage Dimensions-1



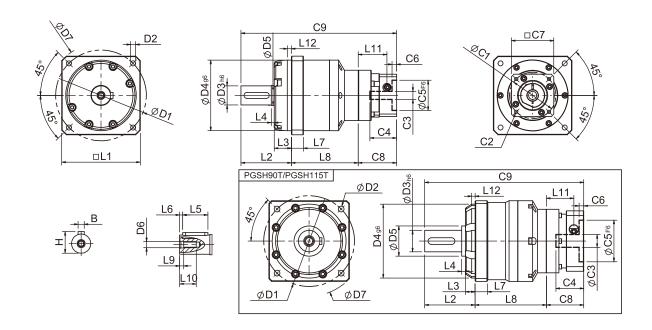
Specifications

Dimensions	PGSH42	PGSH60	PGSH90
D1	60	90	115
D2	M5x0.8P	M6x1.0P	M8x1.25P
D3h6	12	19	24
D4 _{g6}	50	70	90
D5	16.7	20	30
D6	M4x0.7P	M6x1.0P	M8x1.25P
D7	70	104	132
L1	52	78	98
L2	32	50	61
L3	10	17	18
L4	2	3	1.5
L5	16	25	32
L6	2	3	3
L7	10	12	18
L8	56	70.8	95.4
L9	4	4	4.5
L10	12	16.5	20.5
L11	28.5	35.5	40.7
L12	3	4	5
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	≦8/≦11	≦14/≦19	<i>≦</i> 19/ <i>≦</i> 24
C4 ²	26.5	37.6	41.4
C5 ² F6	30	50	70
C6 ²	4.1	4.5	6
C7 ²	42	60	90
C8 ²	38.1	46.5	55.4
C9 ²	126.1	167.3	211.8
В	4	6	8
Н	13.5	21.5	27

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]star$ Specification subject to change without notice.

PGSH Double Stage Dimensions-2



Specifications

Dimensions	PGSH60T	PGSH90T	PGSH115T
D1	90	115	135
D2	M6x1.0P	M8x1.25P	M10x1.5P
D3h6	19	24	32
D4 _{g6}	70	90	110
D5	20	30	45
D6	M6x1.0P	M8x1.25P	M12x1.75P
D7	104	132	164
L1	78	98	120
L2	50	61	75
L3	17	18	14.5
L4	3	1.5	5.5
L5	25	32	40
L6	3	3	5
L7	12	18	18.6
L8	66.3	83.9	106.5
L9	4	4.5	6
L10	16.5	20.5	30
L11	28.5	35.5	40.7
L12	4	5	5
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	≦8/≦11	≦14/≦19	≦19/≦24
C4 ²	26.5	37.6	41.4
C5 ² _{F6}	30	50	70
C6 ²	4.1	4.5	6
C7 ²	42	60	90
C8 ²	38.1	46.5	55.4
C9 ²	154.4	191.4	236.7
В	6	8	10
Н	21.5	27	35

- ★ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.
- ★ Specification subject to change without notice.



PGSH Specifications

	Specificat	tions	Stag	e Ratio	PGSH-42A	PGSH-42	PGSH-60	PGSH-90	PGSH-115	PGSH-142
				3	8	15	53	145	290	520
				4	10	17	55	150	300	550
				5	10	16	54	140	290	600
				6	10	15	46	135	280	560
			1	7						
					10	14	44	125	270	530
				8	9	12	41	110	240	480
				9	9	11	37	95	220	430
				10	9	11	37	95	220	430
			Stag	e Ratio	PGSH-42A	PGSH-42	PGSH-60 / PGSH-60T	PGSH-90 / PGSH-90T	PGSH-115T	PGSH-142T
				15	8	15	53	145	290	520
	Nominal Output Torque	T _{2N} N·m		20	10	17	55	150	300	550
	Trommar Output Torque	7 1210		25	10	16	54	140	290	600
				30	10	16	54	140	290	600
				35						
					10	16	54	140	290	600
				40	10	16	54	140	290	600
			2	45	10	16	54	140	290	600
				50	10	16	54	140	290	600
				60	10	15	46	135	280	560
				70	10	14	44	125	270	530
				80	9	12	41	110	240	480
				90	9	11	37	95	220	430
				100	9	11	37	95	220	430
				100	9				220	430
	Emergency Stop Torque	T _{2NOT} N·m			(3.0 times of Nominal Output Torque) (* Max. Output Torque T_{2B} = 60% of Emergency Stop Torque)					
	Nominal Input Speed	In _{IN} rpm	1,2	3-100	4000	4000	4000	3000	3000	2500
	Max. Input Speed n	_{Lmax} rpm	1,2	3-100	8000	8000	8000	6000	6000	5000
			1	3-10	≦6	<u>≤</u> 6	<u>≤</u> 6	<u>≤</u> 6	<u>≤</u> 5	≦5
	Precision Backlash F	P1 arcmin	2	12-100	≦8	≦8	≦8	≦8	≦7	≦7
			1		≦8	≦8	≦8	≦8	<u>-</u> ≦7	<u> </u>
	Standard Backlash F	P2 arcmin							= ′	
			2	12-100	≦10	≦10	≦10	≦10	≦9	≦9
	Torsional Rigidity	N · m /arcmin	1,2	3-100	2.5	2.5	6	12	23	50
	Max. Radial Load F ₂	_{rB} ¹ N	1,2	3-100	1120	1120	1720	2800	4600	8300
	Max. Axial Load F _{2al}		1,2	3-100	520	520	830	1730	2950	4670
	Operating Temp.	°€		3-100			-10°C∼			
	Service Life	hr		3-100		20,0	00 (10,000 C	ontinuous c	peration)	
			1	3-10				97%	· · · ·	
	Efficiency	%	2	_				94%		
	Weight	le a	1	3-10	0.6	0.6	1.3	3.5	7.8	16.1
	vveignt	kg	2	12-100	0.9	0.9	2.0/1.6	5.6/3.9	9.5	19
	Mounting Position	1 -	1,2					rection		
			_		F0	F0			CF	C7
	Noise Level ²	dBA/1m	_		58	58	60	63	65	67
	Protection Class	-	1,2	3-100			IP	65		
	Lubrication	-	1,2	3-100			Syntheti	c Lubricant		
					Inertia	(J1)	,			
	Stage	Ratio		unit	PGSH-42A	PGSH-42	PGSH-60	PGSH-90	PGSH-115	PGSH-142
	J	3			0.03	0.03	0.23	0.97	2.35	10.00
		4			0.02	0.02	0.18	0.67	1.66	7.17
	1	5			0.02	0.02	0.17	0.65	1.50	6.52
		6/7/8			0.02	0.02	0.14	0.60	1.45	6.17
		9/10		$Kg \cdot cm^2$	0.02	0.02	0.14	0.58	1.41	6.10
	Ctoro			kg cili-						
	Stage	Ratio			PGSH-42A	PGSH-42		PGSH-90(T)		PGSH-142T
		.5/20/25			0.02	0.02	0.17(0.02)	0.65(0.17)	0.65	1.50
2 30/35/40		0/35//0			0.02	0.02	0.14(0.02)	0.60(0.14)	0.60	1 // 5

^{* 1.} Applied to the output shaft center at 100 rpm.

30/35/40

45/50/60/70/80/90/100

2

0.02

0.02

0.14(0.02) 0.60(0.14)

0.14(0.02) 0.58(0.14)

0.02

0.02

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

1.45

0.60

0.58

^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio =

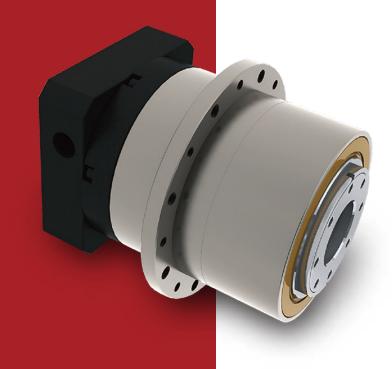
^{*}The above figures/specifications are subject to change without prior notice.

PGV

AGV & AMR Gearboxes

The function of automated guided vehicles (AGVs) or autonomous mobile robots (AMRs) is to transport material and operate continuously. The specific structure and mechanical requirements are extremely high due to their work loading and long term operation. SESAME planetary gearbox PGV series provide the most suitable solution for the drive module of AGV and AMR.

Compact design and reliable performance in precision, high loading capacity and efficiency benefit AGVs and AMRs to move smoothly while carrying the maximum weight. Quality power transmission components and service-life lubricant further reduce downtime and production costs as well.

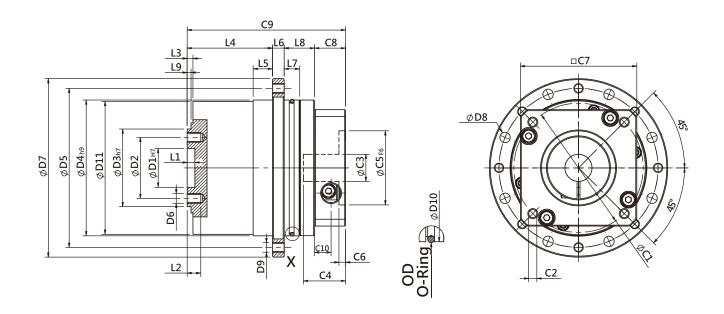


Frame Size(mm)	60, 90, 115
Ratio	3:1-100:1
Nominal Input Speed (rpm)	3,500 - 4,500
Max Input Speed (rpm)	6,500 - 7,500
Backlash (arc-min)	1 Stage: 7 - 9 2 Stages: 9 - 12
Noise Level (dBA / 1m)	58 - 63

Features

- ▶ Designed for AGVs and AMRs driving units.
- ▶ Direct mounting of motor and wheel to save installation space.
- ► Low backlash, low noise, high efficiency.
- ► One-piece planet carrier/output shaft, high rigidity and radial load capacity.
- ➤ One-piece ring gear/housing, high precision and torque output.
- ► IP65 enclosure and synthetic lubricant, maintenance-free service life.
- ► Customized bracket for all servo motors and DC motors.

PGV Single Stage Dimensions



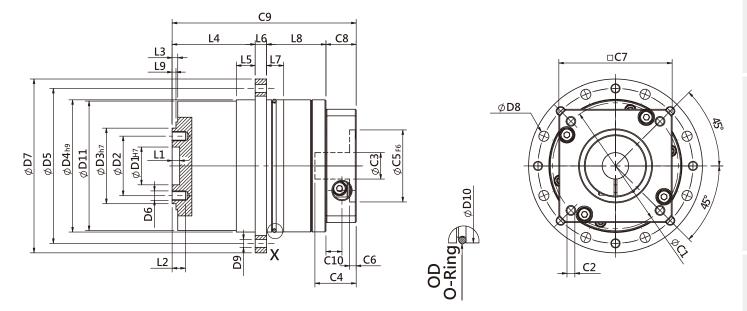
Specifications

Dimensions	PGV60	PGV90	PGV115
D1 _{H7}	20	31.5	40
D2	31.5	50	63
D3h7	40	63	80
D4h7	70	94	120
D5	82	108	142
D6	M5x0.8P	M6x1.0P	M6x1.0P
D7	92	120	158
D8	5.4	6.6	9
D9	M5x0.8P	M6x1.0P	M8x1.25P
D10	70	95	120
D11	69.9	93.9	119.9
L1	4	6	6.5
L2	7	10	12
L3	3	6	6.5
L4	44	59.5	80
L5	10	15	21
L6	6	8	10
L7	8	-	-
L8	15.7	22.9	18
L9	2	5	5.5
C1 ²	66.67	90	115
C2 ²	M5x0.8P	M6x1.0P	M8x1.25P
C3 ²	≦11/≦14/≦19	<i>≦</i> 14/ <i>≦</i> 19/ <i>≦</i> 24	<i>≦</i> 19/ <i>≦</i> 24/ <i>≦</i> 38
C4 ²	21.8	41.3	42.9
C5 ² _{F6}	38.15	70	95
C6 ²	3.5	6	6
C72	60	90	115
C8 ²	16	26	30
C9 ²	81.7	116.4	138
C10 ²	8.5	11.3	13.8
OD	66x2	-	-

 [★] C1~C10 are motor specific dimensions(metric std shown), Size may vary according to motor flange.
 ★ Specification subject to change without notice.



PGV Double Stage Dimensions



Specifications

Dimensions	PGV60	PGV90	PGV115
D1 _{H7}	20	31.5	40
D2	31.5	50	63
D3h7	40	63	80
D4h7	70	94	120
D5	82	108	142
D6	M5x0.8P	M6x1.0P	M6x1.0P
D7	92	120	158
D8	5.4	6.6	9
D9	M5x0.8P	M6x1.0P	M8x1.25P
D10	70	95	120
D11	69.9	93.9	119.9
L1	4	6	6.5
L2	7	10	12
L3	3	6	6.5
L4	44	59.5	80
L5	10	15	21
L6	6	8	10
L7	9	7.7	10
L8	31.4	42.7	45.8
L9	2	5	5.5
C1 ²	66.67	90	115
C2 ²	M5x0.8P	M6x1.0P	M8x1.25P
C3 ²	≦11/≦14/≦19	≦14/≦19/≦24	<i>≦</i> 19/ <i>≦</i> 24/ <i>≦</i> 38
C4 ²	21.8	41.3	42.9
C5 ² _{F6}	38.15	70	95
C6 ²	3.5	6	6
C7 ²	60	90	115
C8 ²	16	26	30
C9 ²	97.4	136.2	165.8
C10 ²	8.5	11.3	13.8
OD	66x2	86x3	110x3

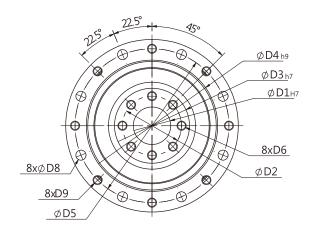
 [★] C1~C10 are motor specific dimensions(metric std shown),
 Size may vary according to the motor flange.
 ★ Specification subject to change without notice.

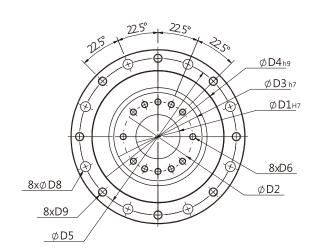


PGV Flange Dimensions

PGV60 PGV90

PGV125





Specifications

Dimensions	PGV60	PGV90	PGV115
D1 _{H7}	20	31.5	40
D2	31.5	50	63
D3h7	40	63	80
D4h9	70	94	120
D5	82	108	142
D6	M5x0.8P	M6x1.0P	M6x1.0P
D8	5.4	6.6	9
D9	M5x0.8P	M6x1.0P	M8x1.25P

[★] Specification subject to change without notice.

PGV Specifications

Sp	ecifications		Stage	Ratio	PGV	-60	PGV	/-90	PGV-	115
				3	4:	1	11	LO	25	0
				4	44	4	12	20	27	
			1	5	4:		12		28	
			1	7	38		10		26	
				8	3!		9		24	
				10	32		8		21	
			Stage	Ratio	PGV		PGV		PGV-	
				9	4:	1	11	LO	25	0
				12	44	4	12	20	27	
Namain al Out	and Tanana T	N · m		15	4!	5	12	20	28	0
Nominal Out	put Torque T _{2N}	' ' '''		16	44	4	12	20	27	0
				20	44	4	12		27	
				25	4!		12		28	
			2	30	4:		11		28	
				35	4:		12		28	
				40	44		12		27	
				50	4!		12		28	
				64	3!		9		24	
				70	38		10		26	
				100	32		8		21	
				100						U
Emergency St	op Torque T_{2NOT}	N·m (2.5 times of Nominal Output Torque) (Max. Output Torque T _{2B} = 60% of Emergency Stop Torque)								
Starting Torque			1	3-10	0.1			.3	0.5	
Starting	y rorque	N·m	2	9-100	0.0		0.25		0.	
Nominal Inp	out Speed n _{1N}	N	1,2	3-100				000	3500	
Max. Input	Speed n _{1max}	N	1,2	3-100	7500		7000		650	00
			1	3-10	≦!	9	<u> </u>	8	≦.	7
Standard E	Backlash P2	arcmin	2	9-100	<u> </u>			10		
Torsiona	al Rigidity	N · m /arcmin	1,2	3-100	8	}	22		5!	5
Max. Radia	al Load F _{2rB} ¹	N	1,2	3-100	330	00	5300		710	00
Max. Axia	l Load F _{2aB} ¹	N	1,2	3-100	31.	20	5000		700	00
Max. Bending	Moment M _{2KB} ¹	N · m	1,2	3-100	11	.0	220		35	0
Operati	ng Temp.	°C	1,2	3-100			-20°C ~ +90°C			
	ce Life	hr	1,2	3-100	3	30,000 (10),000 Cont		peration)	
			1	3-10		. , , - ,		97%		
Ettic	iency	%	2	9-100	≥ 94%					
14/0	eight		1	3-10	1.	8		.3	8.	6
vve	ignt	kg	2	9-100	2.			.3	10	
Mountin	g Position	-	1,2	3-100			Any Di			
	Level ²	dBA/1m	1,2	3-100	5	8		50	63	3
	ion Class	-	1,2	3-100		-	IP			
	cation	-	1,2	3-100			Synthetic			
Edon	cation		1,2	3 100	Inertia (J.		Зупинсис	Labricant		
					PG\		DC	/-90	DCV	-115
Stage	Rati	0		unit	(ψ19)	(ψ14)(ψ11)	ΡG\ (ψ24)(ψ19)	/-90 (ψ14)	(ψ24)	-115 (ψ19)
	3				0.46	0.23	0.77	0.33	2.2	1.87
1	4				0.42	0.21	0.67	0.23	1.51	1.18
-	5~8,	10		_	0.42	0.21	0.61	0.21	1.26	0.93
Chr				$Kg \cdot cm^2$		/-60		/-90		-115
Stage	Rati			-	(ψ19)		(ψ24)(ψ19)	(ψ14)	(ψ24)	(ψ19)
2	9,12,	15			0.46	0.23	0.77	0.33	2.2	1.87
2 Other Ratio		atios			0.42	0.21	0.67	0.23	1.51	1.18

^{* 1.} Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.



^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio = 100 (2-stage).

^{**}The above figures/specifications are subject to change without prior notice.

PGW

Sesame Motor PGW in-line planetary gearheads are designed to bolt-on linear actuator drive systems to shorten powertrain length. Dynamic balanced collar clamping mechanism to actuator and motor shaft ensuring interfaces concentrically and zero slip power transmission at high speed. High quality gears and components are utilized to create compact and rigid unit with low backlash and maintenance-free operation.

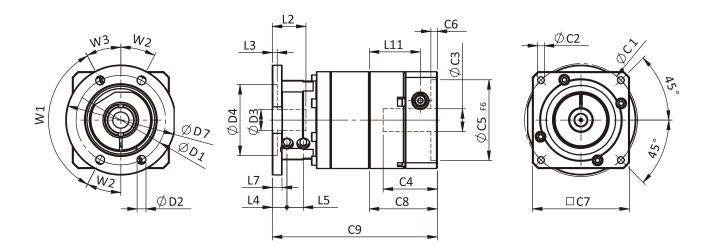


Frame Size (mm)	60, 90, 115
Ratio	3:1-1000:1
Nominal Input Speed (rpm)	2,500 - 4,000
Max Input Speed (rpm)	5,000 - 6,000
Backlash (arc-min)	1 Stage: 6 - 8 2 Stages: 8 - 10 3 Stages: 12
Noise Level (dBA / 1m)	63 - 67

Features

- ► In-line planetary gearhead with zero slip clamping mechanism.
- ► Hollow output shaft and flange are ready to mount to belt or ball screw modules.
- ► One-piece planet carrier/output shaft.
- ► Alloy steel precision gears.
- ► Ratios up to 1000:1.
- ► Lubricated for life and IP65 sealing.
- ► Low noise, low vibration, maintenance-free under normal operating conditions.

PGW Single Stage Dimensions



Specifications

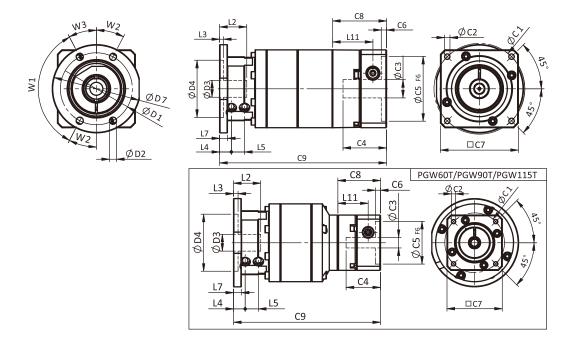
Dimensions	PGW60	PGW90	PGW115
D1	55.5	73	105
D2	5.5	5.5	6.6
D3	16	20	30
D4	44	60	80
D7	70	84	118
L2	31	31	37
L3	3.5	3.5	3.5
L4	9	10.2	12.5
L5	10.2	10.9	13
L7	6	6	10
L11	31.6	37.3	51.8
W1	125° 90°		90°
W2	27.5°	22.5°	22.5°
W3	27.5°	67.5°	67.5°
C1 ²	70	90	145
C2 ²	M5x0.8P	M6x1.0P	M8x1.25P
C3 ²	<u>≤</u> 14/ <u>≤</u> 19	<u>≤</u> 19/ <u>≤</u> 24/ <u>≤</u> 28	<u>≤</u> 24/ <u>≤</u> 32/ <u>≤</u> 38
C4 ²	33.5	41	51.5
C5 ² _{F6}	50	70	110
C6 ²	4	6	6
C72	60	90	130
C8 ²	42.1	51.5	68
C9 ²	102.2	126.5	172

[★] Specification subject to change without notice.



[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

PGW Double Stage Dimensions



Specifications

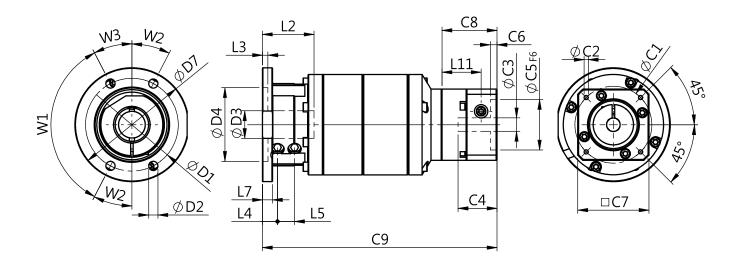
Dimensions	PGW60	PGW60T	PGW90	PGW90T	PGW115T
D1	55	5.5	73	3	105
D2	5.	5	5.	5	6.6
D3	1	6	20)	30
D4	4	4	60)	80
D7	7	0	84	1	118
L2	3	1	31	1	37
L3	3.	5	3.	5	3.5
L4	g)	10	.2	12.5
L5	10	1.2	10.9		13
L7	6	5	6		10
L11	31	23.4	37.3	31	37.3
W1	12	5°	90°		90°
W2	27	.5°	22.5°		22.5°
W3	27	.5°	67.	67.5°	
C1 ²	70	46	90	70	90
C2 ²	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P	M6x1.0P
C3 ²	≦14/≦19	≦8/≦11	≦19/≦24/≦28	<i>≦</i> 14/ <i>≦</i> 19	≦19/≦24/≦28
C4 ²	33.5	26.5	41	33.5	41
C5 ² F6	50	30	70	50	70
C6 ²	4	4	6	4	6
C7 ²	60	42.6	90	60	90
C8 ²	41.5	32.9	51.5	41.5	51.5
C9 ²	128.6	113.3	160.3	145.8	193.6



 $[\]star$ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

[★] Specification subject to change without notice.

PGW Triple Stage Dimensions



Specifications

Dimensions	PGW60T	PGW90T	PGW115T
D1	55.5	73	105
D2	5.5	5.5	6.6
D3	16	20	30
D4	44	60	80
D7	68	84	118
L2	31	31	37
L3	3.5	3.5	3.5
L4	9	10.2	12.5
L5	10.2	10.9	13
L7	6	6	10
L11	23.4	31	37.3
W1	125°	90°	90°
W2	27.5°	22.5°	22.5°
W3	27.5°	67.5°	67.5°
C1 ²	46	70	75
C2 ²	M3x0.5P	M5x0.8P	M5x0.8P
C3 ²	≦8/≦11	≦14/≦19	<i>≦</i> 19/ <i>≦</i> 24/ <i>≦</i> 28
C4 ²	26.5	33.5	41
C5 ² _{F6}	30	50	60
C6 ²	4	4	6
C72	42.6	60	90
C8 ²	32.9	41.5	51.5
C9 ²	140.3	179.6	227.4

[★] Specification subject to change without notice.



[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

PGW Specifications

Spec	cifications		Stage	Ratio	PGW60	PGW90	PGW115		
<u> </u>				3	28	85	200		
				4	32	80	215		
			-1	5	35	95	215		
			1						
				7	28	85	200		
				9	23	75	195		
				10	21	65	180		
			Stage	Ratio	PGW60/PGW60T	PGW90/PGW90T	PGW115T		
				15	35/24	95/68	168		
				20	35/31	95/95	215		
				25	35/30	95/95	215		
				35	35/28	95/95	215		
			2	45	35/27	95/92	215		
		l	2						
Nominal Out	put Torque T _{2N}	N•m		50	35/27	95/82	205		
				70	28/28	85/85	200		
				90	23/23	75/75	195		
				100	21/21	65/65	180		
			Stage	Ratio	PGW60T	PGW90T	PGW115T		
				125	35	95	215		
				175	35	95	215		
				225	35	95	215		
				245	35	95	215		
			2	315	35	95	215		
			3						
				405	35	95	215		
				567	28	85	200		
				729	23	75	195		
				1000	21	65	180		
Emergency Sto	op Torque T _{2NOT}	N•m		(*N		ninal Output Torque) 0% of Emergency Stop To	oraue)		
Nominal Inc	out Speed n _{1N}		1,2,3	3-1000	4000	3000	2500		
Nominarin	out speed n _{iN}	rpm	1,2,3	3-1000	4000	3000	2500		
Max. Input	Speed n _{1max}	rpm	1,2,3	3-1000	6000	6000	5000		
			1	3-10	≤ 8	≤ 7	<u>≦</u> 6		
Standard F	Backlash P2	arcmin	2	15-100	<u></u> ≦10	<u></u> ≦9	<u>-</u> ≦8		
			3	125~1000	<u></u> <u>≤</u> 12	≤12	≤12		
Operation	ng Tamp	°C	1,2,3	1231000	<u> </u>	-10°C ~ +90°C			
	ng Temp.			3-1000	20.000		vation)		
Servi	ce Life	hr	1,2,3		20,00	0 (10,000 Continuous oper			
		_,	1	3-10		≥ 95%			
Effic	iency	%	2	15-100		≥ 90%			
			3	125~1000		≥ 85%			
			1	3-10	1.2	2.9	6.4		
We	ight	kg	2	15-100	1.6/1.4	4.3/3.2	8.0		
			3	125~1000	1.8	4.6	9.4		
Mountin	g Position	- 1	1,2,3	3-1000		Any Direction			
	Level 2	dBA/1m	1,2,3	3-1000	63	66	67		
	ion Class		1,2,3	3-1000	-	IP65			
	cation	-	1,2,3	3-1000		Synthetic Lubricant			
Edbii			-,-,-		Inertia (J1)	Symmetic Editional Conference			
Stage	Ratio)		unit	PGW60(\phi14)	PGW90(φ19)	PGW115(φ24)		
Juge	3			WIIIC .	0.23	0.77	2.30		
1	4			ŀ	0.21	0.67	1.92		
-		<u> </u>		ŀ	0.21	0.61	1.71		
5~10		J		-		PGW90(\$19)/			
Stage	Ratio)		kg•cm²	PGW60(φ14)/ PGW60T(φ8)		PGW115T(φ19)		
9-					\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	PGW90T(ф14)			
2	15				0.23/(0.04)	0.77/(0.23)	0.77		
	Other Ra			ļ	0.21/(0.03)	0.61/(0.21)	0.61		
Stage	Ratio			ļ.	PGW60T(φ8)	PGW90T(φ14)	PGW115T(φ19)		
3	All Ratios		1		0.03	0.21	0.61		

^{* 1.} Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.



^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio =

^{**}The above figures/specifications are subject to change without prior notice.



PGWR Planetary Gearboxes



Single Stage

Double Stage

Double Stage -2

Features

- Right angle configuration
- Torque Capacity Range: 8 Nm through 215 Nm
- Caged Planet Carrier: with standard planet gear set
- High performance, efficiencies and low acoustics
- Wide Range of Ratios: 11 single stage, 16 two-stage ratios
- Input adapter for all servo and stepper motors

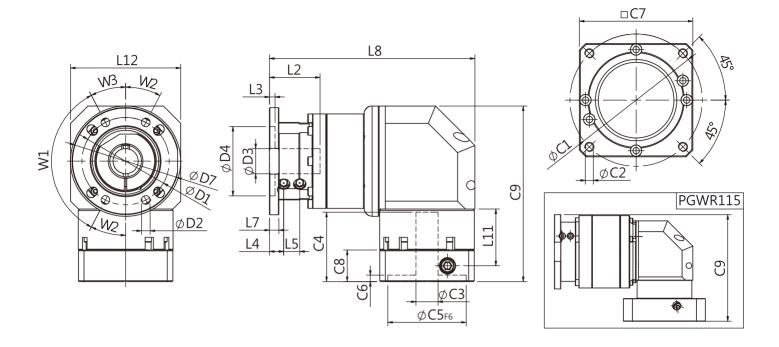
SESAME MOTOR CORP.

599, Sec1, Hemu Rd, Shengang, Taichung 42953, Taiwan TEL: +886-4-2561-0011 FAX: +886-4-2562-7766 info@sesamemotor.com.tw





PGWR Single Stage Dimensions



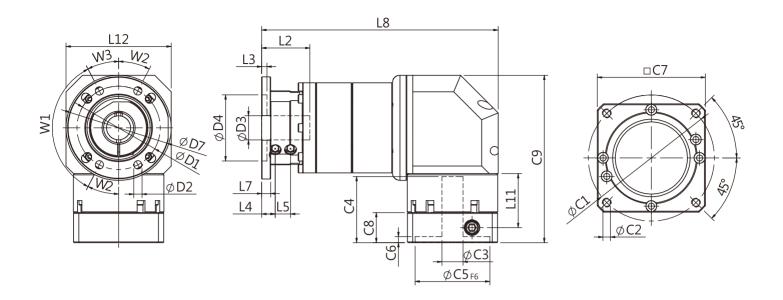
Specifications Unit: mm

Dimensions	PGWR50	PGWR60	PGWR90	PGWR115
D1	-	55.5	73	105
D2	-	5.5	5.5	6.6
D3	-	16	20	30
D4	-	44	60	80
D7	-	70	84	118
L2	-	31.1	35	40.5
L3	-	3.5	3.5	3.5
L4	-	9	10.2	12.5
L5	-	10.2	10.9	13
L7	-	6	6	10
L8	-	130.4	182	219.6
L11	-	36	40.7	40.7
L12	-	70	98	98
W1	-	125°	90°	90°
W2	-	27.5°	22.5°	22.5°
W3	-	27.5°	67.5°	67.5°
C1 ²	-	70	90	145
C2 ²	-	M5x0.8P	M6x1.0P	M8x1.25P
C3 ²	-	<u>≤</u> 14/ <u>≤</u> 19	<i>≦</i> 19/ <i>≦</i> 24	<u>≤</u> 24
C4 ²	-	44	57	62
C5 ² _{F6}	-	50	70	110
C6 ²	-	4	6	9
C7 ²	-	60	90	130
C8 ²	-	20	26	36
C9 ²	-	111.4	149.2	169.2



 ^{2.} C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.
 ★ Specification subject to change without notice.

PGWR Double Stage Dimensions



Specifications Unit: mm

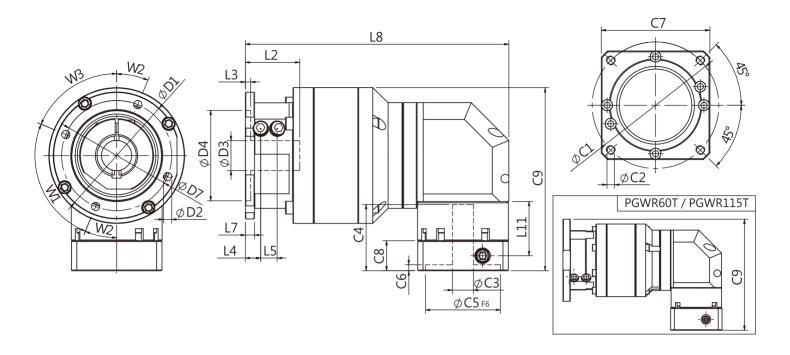
Dimensions	PGWR50	PGWR60	PGWR90
D1	-	55.5	73
D2	-	5.5	5.5
D3	-	16	20
D4	-	44	60
D7	-	70	84
L2	-	31.1	35
L3	-	3.5	3.5
L4	-	9	10.2
L5	-	10.2	10.9
L7	-	6	6
L8	-	157.4	215.8
L11	-	36	40.7
L12	-	70	98
W1	-	125°	90°
W2	-	27.5°	22.5°
W3	-	27.5°	67.5°
C1 ²	-	70	90
C2 ²	-	M5x0.8P	M6x1.0P
C3 ²	-	<i>≦</i> 14/ <i>≦</i> 19	<u>≤</u> 19/ <u>≤</u> 24
C4 ²	-	44	57
C5 ² _{F6}	-	50	70
C6 ²	-	4	6
C7 ²	-	60	90
C8 ²	-	20	26
C9 ²	-	111.4	149.2



^{2.} C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

[★] Specification subject to change without notice.

PGWR Double Stage Dimensions-2



Specifications Unit: mm

Dimensions	PGWR60T	PGWR90T	PGWR115T
D1	55.5	73	105
D2	5.5	5.5	6.6
D3	16	20	30
D4	44	60	80
D7	70	84	118
L2	31.1	35	40.5
L3	3.5	3.5	3.5
L4	9	10.2	12.5
L5	10.2	10.9	13
L7	6	6	10
L8	131.4	174.6	249.1
L11	26.5	36	40.7
W1	125°	90°	90°
W2	27.5°	22.5°	22.5°
W3	27.5°	67.5°	67.5°
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	<u>≤</u> 8/ <u>≤</u> 11	<u>≤</u> 14/ <u>≤</u> 19	≦19/≦24
C4 ²	33	44	57
C5 ² _{F6}	30	50	70
C6 ²	4	4	6
C7 ²	42.6	60	90
C8 ²	18.5	20	26
C9 ²	92	121.4	159.2



^{2.} C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

* Specification subject to change without notice.

PGWR Specifications Table



Specifications		Stage	Ratio	PGWR-50	PGWR-60	PGWR-90	PGWR-115
			3	16	28	85	135
			4	18	32	80	180
			5	17	35	95	215
			7	14	28	85	200
			8	18	32	80	195
		1	9	16	25	75	195
		_	10	17	35	95	210
			12	18	32	80	-
			14	14	28	85	200
			15	17	35	95	105
			16	- 11	23	75	195
		Stage	20 Ratio	11 PGWR-50	PGWR-60/ PGWR-60T	PGWR-90/ PGWR-90T	PGWR-115T
Nominal Output Torque T _{2N}	N•m		20	20	35/31	95 / 95	215
Troninal Output Forque 12N	'\'''		25	17	35/31	95 / 95	215
			30	19	35/30	95 / 95	215
			35	17	35 / 28	95 / 95	215
			40	20	35/31	95 / 95	215
			50	17	35/30	95 / 95	215
			60	17	35 / 30	95 / 95	215
		2	70	17	35 / 28	95 / 95	215
			80	17	35 / 27	95 / 92	215
			100	17	35 / 27	95 / 82	205
			120	17	35 / 27	95 / 92	215
			140	14	-	-	_
			160	-	23 / 23	75 / 75	195
			200	11	21 / 21	65 / 65	180
			243	-	23 / 23	75 / 75	195
			300	11	21 / 21	65 / 65	180
Max. Output Torque T2B	N∙m			60% o	f Emergency Stop T		
Emergency Stop Torque T _{2NOT}	N•m			2.5 Time:	s of Nominal Outpu	t Torque	
Nominal Input Speed n _{1N}	rpm	1,2	3-300	5000	4000	3000	2500
Max. Input Speed n _{1max}	rpm	1,2	3-300	8500	7000	6000	5000
Standard Backlash P2	arcmin	1	3-20	≦ 15	≤ 15	≦ 13	≦ 11
Standard Backlash F2	arcmin	2	20-300	<u>≤</u> 17	<u>≤</u> 17	<u>≤</u> 15	<u>≤</u> 13
Operating Temp.	°C	1,2	3-300			- +90°C	
Service Life	hr	1,2	3-300		20,000 (10,000 Con	tinuous Operation)
	%	1	3-20		≥ 9	5%	
Efficiency	/0	2	20-300		≥ 9	0%	
Weight	kg	1	3-10	1.2	2.5	6.2	12.3
		2	12-100	1.5	3.0/2.8	8.2/6.6	13.9
Mounting Position	_	1,2	3-300			rection	
Noise Level ¹	dBA/1m	1,2	3-300	63	68	70	73
Protection Class	-	1,2	3-300		IP	65	
Lubrication	-	1,2	3-300		Synthetic	Lubricant	

Inertia(J1)

Stage	Ratio	unit	PGWR-50(Ø8)	PGWR-60(Ø14)	PGWR-90(Ø19)	PGWR-115(Ø24)
1	3,4,5,7		0.07	0.4	2.0	2.7
ı ı	Other ratios		0.05	0.3	1.5	2.2
Stage	Ratio	Kg∙ cm²	PGWR-50(Ø8)	PGWR-60(Ø14)/ -60T(Ø8)	PGWR-90(Ø19)/ -90T(Ø14)	PGWR-115T (Ø19)
2	20,25,35		0.07	0.4 / 0.07	2.0 / 0.4	2.0
2	Other ratios		0.05	0.3 / 0.05	1.5 /0.3	1.5

^{1.} Applied to the output shaft center 100 rpm.
2. Measured at 3000 rpm with no load. These values are measured by gearbox with ratio = 100 (2-stage) at nominal input speed or 3000 rpm (if nominal input speed is higher than 3000 rpm) with no load.

X The above figures/specifications are subject to change without prior notice.

PHF

PHF rotary flange planetary gearheads conform to ISO 9409-1 robotic flange standards, provide wide range of performance levels to satisfy industry motion control application requirements. Taper roller bearings with bending moment load capacity up to 6080 N, and axial load capacities up to 21850 N.



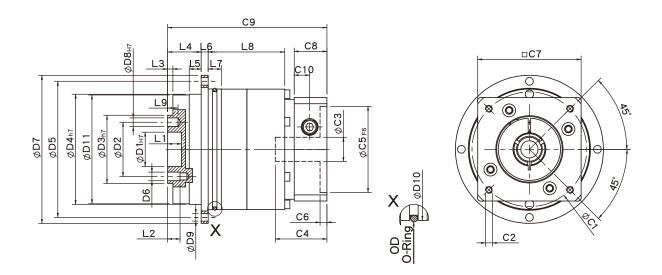


Frame Size (mm)	42, 60, 90, 115, 142, 200, 255
Ratio	3:1 - 100 : 1
Nominal Input Speed (rpm)	2,000 - 5,000
Max Input Speed (rpm)	4,000 - 10,000
Backlash (arc-min)	1 Stage : 1 - 6 2 Stages : 3 - 8
Noise Level (dBA / 1m)	56 - 70

Features

- ▶ 7 Frame sizes available, 42~255 mm, in-line or right angle configuration.
- ► Backlash as low as 1 arc-minute, ultimate performance.
- ► One-piece planet carrier/output shaft, large torsional rigidity.
- ► Tapered roller bearings, high moment and radial load capacity.
- ► Hardened and ground gearing, high wear resistance and impact toughness.
- ➤ One-piece ring gear/housing, high precision and torque output.
- ► Planets with full needle bearing support.
- ► ISO 9409-1 robotic flange mounting dimensions.
- ▶ IP65 enclosure and synthetic lubricant, maintenance-free service life.
- ► Adapters for all servo motors.

PHF Single Stage Dimensions



Specifications Unit:mm

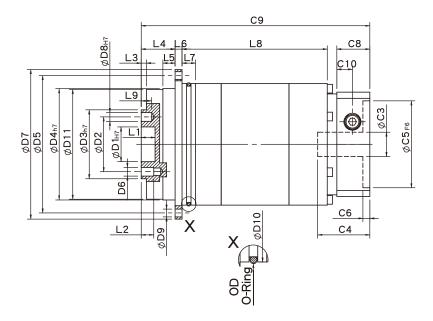
Dimensions	PHF42	PHF60	PHF90	PHF115	PHF142	PHF200	PHF255
D1 _{H7}	12	20	31.5	40	50	80	100
D2	20	31.5	50	63	80	125	140
D3h7	28	40	63	80	100	160	180
D4h7	47	64	90	110	140	200	255
D5	67	79	109	135	168	233	280
D6	M3x0.5P	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P	M10x1.5P	M16x2.0P
D7	72	86	118	145	179	247	300
D8 _{H7}	3	5	6	6	8	10	12
D9	3.4	4.5	5.5	5.5	6.6	9	13.5
D10	60	70	95	120	152	212	255
D11	46.2	63.2	89.2	109.2	139.2	199.2	254.2
L1	4	8	12	12	12	12	20
L2	6	7.2	12	13.5	16	22.5	30.5
L3	3	3	6	6	6	8	12
L4	19.5	19.5	30	29	38	50	66
L5	7	7	10	10	14.6	15	20
L6	4	4	7	8	10	12	18
L7	5	7.7	8	10	12	17	39.5
L8	25	37.5	36.5	54.5	65	92	118
L9	4	6	7	7	7	10	10
C1 ²	46	70	90	115	145	200	235
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P	M12x1.75P
C3 ²	≦8/≦11	<u>≤</u> 14/ <u>≤</u> 19	≦19/≦24	<i>≦</i> 24/ <i>≦</i> 32/ <i>≦</i> 38	<u>≤</u> 35/ <u>≤</u> 38	<u>≤</u> 50	<u>≤</u> 55
C4 ²	28.1	36.5	41.2	51.1	69.7	81	112
C5 ² F6	30	50	70	95	110	114.3	200
C6 ²	4	4	6.7	6	8.5	6	6
C7 ²	42	60	90	115	140	182	220
C8 ²	16.5	19	25.5	30	38	40	50
C9 ²	74.8	92.5	107	131.5	171.5	215	271
C10 ²	7.4	9	11.3	13.9	17.8	21	21
OD	56x2	66x2	90x3	110x3	145x3	200x5	238x5

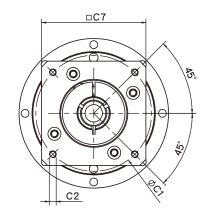
 $[\]star$ C1~C10 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

[★] Specification subject to change without notice.



PHF Double Stage Dimensions-1





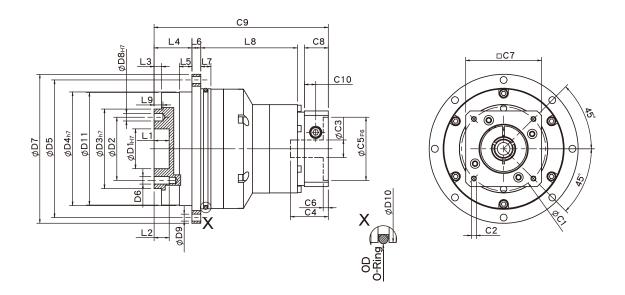
Specifications

Dimensions	PHF42	PHF60	PHF90
D1 _{H7}	12	20	31.5
D2	20	31.5	50
D3h7	28	40	63
D4h7	47	64	90
D5	67	79	109
D6	M3x0.5P	M5x0.8P	M6x1.0P
D7	72	86	118
D8 _{H7}	3	5	6
D9	3.4	4.5	5.5
D10	60	70	95
D11	46.2	63.2	89.2
L1	4	8	12
L2	6	7.2	12
L3	3	3	6
L4	19.5	19.5	30
L5	7	7	10
L6	4	4	7
L7	5	7.7	8
L8	54.5	72.5	81.5
L9	4	6	7
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	≦8/≦11	<u>≤</u> 14/ <u>≤</u> 19	≦19/≦24
C4 ²	28.1	36.4	41.2
C5 ² _{F6}	30	50	70
C6 ²	4	4	6.7
C7 ²	42	60	90
C8 ²	16.5	19	25.5
C9 ²	102.5	127.5	151.5
C10 ²	7.4	9	11.3
OD	56x2	66x2	90x3
00	JUXZ	UUXZ	3072

[★] C1~C10 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]star$ Specification subject to change without notice.

PHF Double Stage Dimensions-2



Specifications Unit:mm

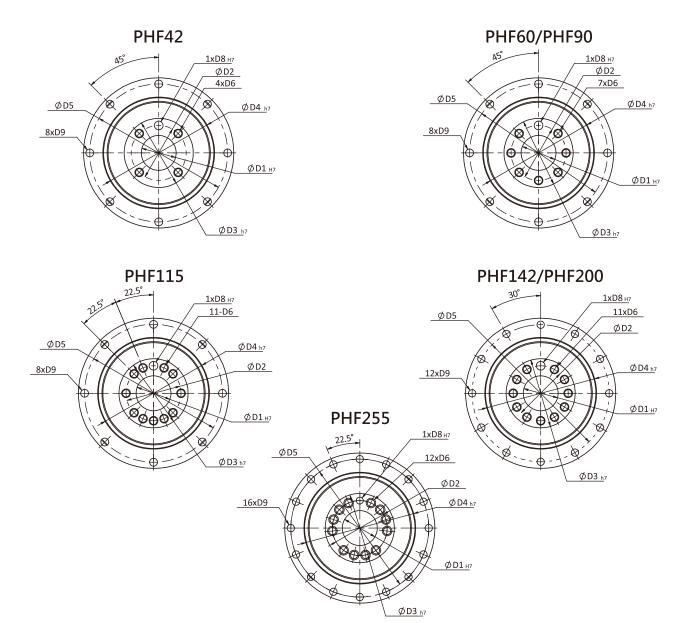
Dimensions	PHF60T	PHF90T	PHF115T	PHF142T	PHF200T	PHF255T
D1 _{H7}	20	31.5	40	50	80	100
D2	31.5	50	63	80	125	140
D3h7	40	63	80	100	160	180
D4h7	64	90	110	140	200	255
D5	79	109	135	168	233	280
D6	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P	M10x1.5P	M16x2.0P
D7	86	118	145	179	247	300
D8 _{H7}	5	6	6	8	10	12
D9	4.5	5.5	5.5	6.6	9	13.5
D10	70	95	120	152	212	255
D11	63.2	89.2	109.2	139.2	199.2	254.2
L1	8	12	12	12	12	20
L2	7.2	12	13.5	16	22.5	30.5
L3	3	6	6	6	8	12
L4	19.5	30	29	38	50	66
L5	7	10	10	14.6	15	20
L6	4	7	8	10	12	18
L7	7.7	8	10	12	17	39.5
L8	65.2	69.5	93.5	110	161.7	192
L9	6	7	7	7	10	10
C1 ²	46	70	90	115	145	200
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 ²	≦8/≦11	≦14/≦19	≦19/≦24	≦24/≦32/≦38	≦35/≦38	≦50
C4 ²	28.1	36.5	41.2	51.1	69.7	81
C5 ² _{F6}	30	50	70	95	110	114.3
C6 ²	4	4	6.7	6	8.5	6
C72	42	60	90	115	140	180
C8 ²	16.5	19	25.5	30	38	40
C9 ²	113.2	138	163.1	198	281	335
C10 ²	7.4	9	11.3	13.9	17.8	21
OD	66x2	90x3	110x3	145x3	200x5	238x5

 $[\]star$ C1~C10 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]bigstar$ Specification subject to change without notice.



PHF Flange Dimensions



Specifications	Unit:mm

Dimensions	PHF42	PHF60	PHF90	PHF115	PHF142	PHF200	PHF255
D1 _{H7}	12	20	31.5	40	50	80	100
D2	20	31.5	50	63	80	125	140
D3h7	28	40	63	80	100	160	180
D4 _{h7}	47	64	90	110	140	200	255
D5	67	79	109	135	168	233	280
D6	M3x0.5P	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P	M10x1.5P	M16x2.0P
D8 _{H7}	3	5	6	6	8	10	12
D9	3.4	4.5	5.5	5.5	6.6	9	13.5

 $[\]star$ Specification subject to change without notice.

PHF Specifications

Specific	ations		Stage	Ratio	PHF42	PHF60	PHF90	PHF115	PHF142	PHF200	PHF255
				3	-	40	105	180	340	580	1100
				4	16	43	110	240	500	1100	1700
			1	5	17	50	130	290	600	1200	2000
				7	14	44	125	270	530	1100	1750
				10	11	37	95	220	430	900	1450
			Stage	Ratio	PHF42	PHF60(T)	PHF90(T)	PHF115T	PHF142T	PHF200T	PHF255T
	_			15	-	40	105	180	600	1200	2000
Nominal Output Tord	que I _{2N}	N•m		20	16	43	110	240	600	1200	2000
				25	17	50	130	290	600	1200	2000
			30	17	50	130	290	600	1200	2000	
			2	35	17	50	130	290	600	1200	2000
				40	17	50	130	290	600	1200	2000
				50	17	50	130	290	600	1200	2000
				70	14	44	125	270	530	1100	1750
				100	11	37	95	220	430	900	1450
Emergency Stop Torq	ue T _{2NOT}	N•m			((3.0 Max. Outpu'	0 times of No t Torque T _{2B} =	minal Outpu 60% of Eme	t Torque) rgency Stop	Torque)	
Nominal Input Spee	ed n _{in}	rpm	1,2	3-100	5000	5000	4000	4000	3000	3000	2000
Max. Input Speed	n _{1max}	rpm	1,2	3-100	10000	10000	8000	8000	6000	5000	4000
Micro Backlash I	Micro Backlash PO		1	3-10	≦ 2	≦2	≦ 2	≤ 1	≦1	≤ 1	≦1
TVIICIO BUCKIUSTI	WHEIO BUCKIUSH I O		2	12-100	<u>≤</u> 4	<u>≤</u> 4	<u>≤</u> 4	<u>≦</u> 3	<u>≦</u> 3	<u>≦</u> 3	≦3
Precision Backlash	Precision Backlash P1 arcmin		1 2	3-10 12-100	≦ 4 ≦ 6	≦ 4 ≦ 6	≤ 4 ≤ 6	≦3 ≦5	≦ 3 ≦ 5	≦3 ≦5	≦ 3 ≦ 5
Standard Backlash	Standard Backlash P2 arcmir		1 2	3-10 12-100	≦ 6 ≦ 8	≦ 6 ≦ 8	≦ 6 ≦ 8	≦ 5 ≦ 7	≦ 5 ≦ 7	≦ 5 ≤ 7	≦ 5 ≦ 7
Torsional Rigidi	ty	N•m /arcmin	1,2	3-100	6	12	30	80	150	450	1000
Max. Bending Mome	nt M _{2kB} ¹	N•m	1,2	3-100	43	125	288	503	1470	2950	6080
Max. Axial Load F		N	1,2	3-100	1015	1340	2868	3890	9850	12560	21850
Operating Tem	р.	°C		3-100	-10°C ~ +90°C						
Service Life		hr		3-100			30,000 (15,00		ıs Operation)		
Efficiency		%	1 2	3-10 12-100				≧ 97% ≥ 94%			
Weight		kg	1	3-10	0.7	1.5	3.5	6.2	13.6	32.1	63.3
		9	2	12-100	1.1	2.3 (1.8)	6.0 (4.1)	8.1	17.9	38.6	79.5
Mounting Position	on	-	1,2	3-100				Any Direction			
Noise Level 2		dBA/1m	1,2	3-100	56	58	60	63	65	67	70
Protection Clas	S	-	1,2	3-100				IP65			
Lubrication		-	1,2	3-100			Syr	thetic Lubric	ant		
						a (J1)					
Stage	R	atio	ur	nit	PHF42	PHF60	PHF90	PHF115	PHF142	PHF200	PHF255
		3			-	0.19	0.72	2.35	9.05	29.80	72.50
		4			0.02	0.18	0.67	1.66	7.17	25.86	58.21
1		7			0.02	0.17 0.14	0.65 0.60	1.50 1.45	6.52 6.17	23.63 22.92	54.36 54.12
-		10	kg•	cm ²	0.02	0.14	0.58	1.41	6.10	22.73	53.98
Stage		atio			PHF42	PHF60(T)	PHF90(T)	PHF115T	PHF142T	PHF200T	PHF255T
		5/20			0.02	0.17 (0.02)	0.65 (0.17)	0.65	2.35	9.05	29.8
2	25/30	0/35/40			0.02	0.14 (0.02)	0.60 (0.14)	0.60	1.45	6.17	22.92
	50/7	70/100			0.02	0.14 (0.02)	0.58 (0.14)	0.58	1.41	6.10	22.73

^{* 1.} Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.



 $[\]star$ 2. Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio =

^{*}The above figures/specifications are subject to change without prior notice.

PHFR

The PHFR Precision Round mounting flange, caged precision class helical planetary speed reducer in a right-angle housing through sizes 255. ISO-9409 flange output, high torque capacity, quiet operation with backlash as low as <2 arc-min. This gearbox provide a wide range of performance levels to high positioning accuracy and motion control applications, particularly when high precision and high torsional rigidity are required. Taper roller bearings with bending moment load capacity up to 6500 N.m, and axial load capacity up to 21850 N. The PHFR is specially well suited to work with pinion and rack for linear operation. Commonly adapted in metal cutting machines, wood processing equipment, machine centers and highly dynamic motion control systems. In-line configuration (PHF series) is also available with max. Frame size 255 mm.

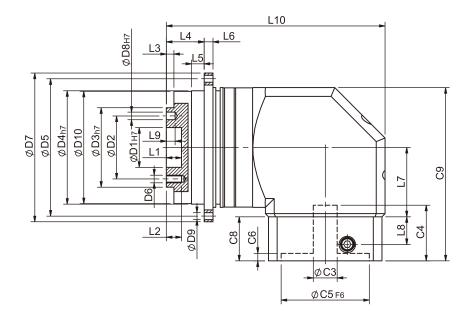


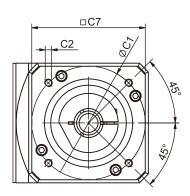
Frame Size (mm)	42, 60, 90, 115, 142, 200, 255
Ratio	3:1-200:1
Nominal Input Speed (rpm)	2,000 - 5,000
Max Input Speed (rpm)	4,000 - 10,000
Backlash (arc-min)	1 Stage : 2 - 7 2 Stages : 4 - 9
Noise Level (dBA / 1m)	62 - 74

Features

- ► ISO 9409 Flange Output.
- ▶ 3 levels of backlash, 7 frame sizes from 42-255 mm.
- ▶ Premium and precision gear design, ratios from 3-200:1.
- ➤ One-piece planet carrier/output shaft, high rigidity and radial load capacity.
- ► Hardened and ground gearing, high wear resistance and impact toughness.
- ➤ One-piece ring gear/housing, high precision and torque output.
- ▶ Planets with full needle bearing support.
- ▶ IP65 enclosure and synthetic lubricant, maintenance-free service life.

PHFR Single Stage Dimensions





Specifications Unit:mm

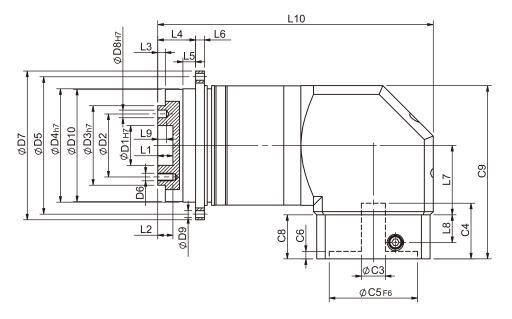
Dimensions	PHFR42	PHFR60	PHFR90	PHFR115	PHFR142	PHFR200	PHFR255
D1 _{H7}	12	20	31.5	40	50	80	100
D2	20	31.5	50	63	80	125	140
D3h7	28	40	63	80	100	160	180
D4h7	47	64	90	110	140	200	255
D5	67	79	109	135	168	233	280
D6	M3x0.5P	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P	M10x1.5P	M16x2.0P
D7	72	86	118	145	179	247	300
D8 _{H7}	3	5	6	6	8	10	12
D9	3.4	4.5	5.5	5.5	6.6	9	13.5
D10	46.2	63.2	89.2	109.2	139.2	199.2	254.2
L1	4	8	12	12	12	16	20
L2	6	7.2	12	13.5	16	22.5	30.5
L3	3	3	6	6	6	8	12
L4	19.5	19.5	30	29	38	50	66
L5	7	7	10	10	14.6	15	20
L6	4	4	7	8	10	12	18
L7	32.2	44.8	55	69	71	92.5	92.5
L8	13.5	21.5	22	32	44.7	44	60
L9	4	6	7	7	7	10	10
L10	92.2	128.3	173.6	204.2	250.7	330.7	392.2
C1 ²	46	70	90	90	145	200	215
C2 ²	M4x0.7P	M5x08P	M6x1.0P	M6x1.0P	M8x1.25P	M12x1.75P	M12x1.75P
C3 ²	≦8/≦11	≦14/≦19	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 32	≦35	≦50	≦55
C4 ²	29	34	44	53.5	76.8	78.8	98.7
C5 ² _{F6}	30	50	70	70	110	114.3	180
C6 ²	6	5	5	5.5	9	6	6
C7 ²	42.6	60	90	115	140	180	220
C8 ²	25	33	35	48	65	65	85
C9 ²	78.5	112.8	137.5	176.5	225.5	246.5	266.5

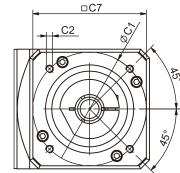
 $[\]star$ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]bigstar$ Specification subject to change without notice.



PHFR Double Stage Dimensions-1





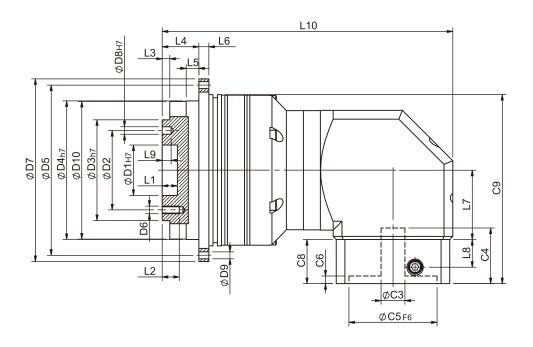
Specifications

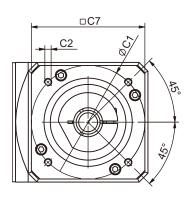
D:	DUED 42	DUEDCO	DUEDOO
Dimensions	PHFR42	PHFR60	PHFR90
D1 _{H7}	12	20	31.5
D2	20	31.5	50
D3h7	28	40	63
D4h7	47	64	90
D5	67	79	109
D6	M3x0.5P	M5x0.8P	M6x1.0P
D7	72	86	118
D8H7	3	5	6
D9	3.4	4.5	5.5
D10	46.2	63.2	89.2
L1	4	8	12
L2	6	7.2	12
L3	3	3	6
L4	19.5	19.5	30
L5	7	7	10
L6	4	4	7
L7	32.2	44.8	55
L8	13.5	21.5	22
L9	4	6	7
L10	119.9	163.3	218.6
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x08P	M6x1.0P
C3 ²	≦8	<u>≤</u> 14	≦19/≦24
C4 ²	29	34	44
C5 ² F6	30	50	70
C6 ²	6	5	5
C72	42.6	60	90
C8 ²	25	33	35
C9 ²	78.5	112.8	137.5

 $[\]star$ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]bigstar$ Specification subject to change without notice.

PHFR Double Stage Dimensions-2





Specifications Unit:mm

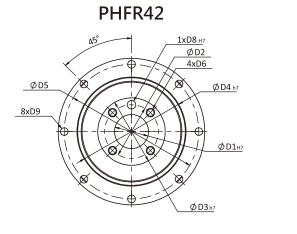
Dimensions	PHFR60T	PHFR90T	PHFR115T	PHFR142T	PHFR200T	PHFR255T
D1 _{H7}	20	31.5	40	50	80	100
D2	31.5	50	63	80	125	140
D3h7	40	63	80	100	160	180
D4h7	64	90	110	140	200	255
D5	79	109	135	168	233	280
D6	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P	M10x1.5P	M16x2.0P
D7	86	118	145	179	247	300
D8 _{H7}	5	6	6	8	10	12
D9	4.5	5.5	5.5	6.6	9	13.5
D10	63.2	89.2	109.2	139.2	199.2	254.2
L1	8	12	12	12	16	20
L2	7.2	12	13.5	16	22.5	30.5
L3	3	6	6	6	8	12
L4	19.5	30	29	38	50	66
L5	7	10	10	14.6	15	20
L6	4	7	8	10	12	18
L7	32.2	44.8	55	69	71	92.5
L8	13.5	21.5	22	32	44.7	44
L9	6	7	7	7	10	10
L10	130.6	173.8	230.6	270.7	361.4	439.2
C1 ²	46	70	90	90	145	200
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P	M12x1.75P
C3 ²	≦8/≦11	≦14/≦19	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 32	<u>≤</u> 35	<u>≤</u> 50
C4 ²	29	34	44	53.5	76.8	78.8
C5 ² F6	30	50	70	70	110	114.3
C6 ²	6	5	5	5.5	9	6
C7 ²	42.6	60	90	115	140	92.5
C8 ²	25	33	35	48	65	65
C9 ²	84.4	125.3	150	176.5	259.5	284

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

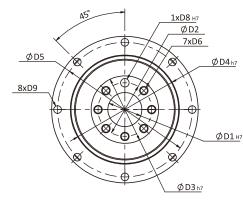
 $[\]star$ Specification subject to change without notice.



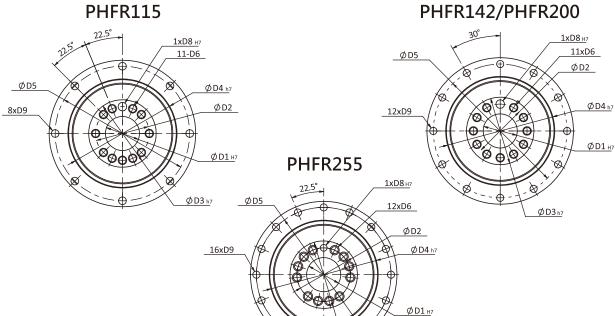
PHFR Flange Dimensions



PHFR60/PHFR90



PHFR115



Specifications Unit:mm

Ø D3 h7

Dimensions	PHFR42	PHFR60	PHFR90	PHFR115	PHFR142	PHFR200	PHFR255
D1 _{H7}	12	20	31.5	40	50	80	100
D2	20	31.5	50	63	80	125	140
D3h7	28	40	63	80	100	160	180
D4 _{h7}	47	64	90	110	140	200	255
D5	67	79	109	135	168	233	280
D6	M3x0.5P	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P	M10x1.5P	M16x2.0P
D8 _{H7}	3	5	6	6	8	10	12
D9	3.4	4.5	5.5	5.5	6.6	9	13.5

 $[\]star$ Specification subject to change without notice.

PHFR Specifications

Specifica	tions		Stage	Ratio	PHFR42	PHFR60	PHFR90	PHFR115	PHFR142	PHFR200	PHFR255
				3	-	40	105	180	340	580	950
				4	16	43	110	240	500	1100	1500
				5	17	50	130	290	600	1200	1800
			1	7	14	44	125	270	530	1100	1750
				10	17	50	130	260	540	900	1500
				14	14	44	125	270	530	1100	1750
				20	11	37	95	220	430	900	1450
			Stage	Ratio	PHFR42	PHFR60(T)	PHFR90(T)	PHFR115T	PHFR142T	PHFR200T	PHFR255T
				15	-	40	105	180	600	1200	2000
Nominal Output Torqu	ue T _{2N}	N∙m		20	16	43	110	240	600	1200	2000
				25	17	50	130	290	600	1200	2000
				30	17	40	105	180	600	1200	2000
				35	17	50	130	290	600	1200	2000
			2	40	16	43	110	240	600	1200	2000
			_	50	17	50	130	290	600	1200	2000
				70	14	44	125	270	530	1100	1750
				100	11	37	95	220	430	900	1450
				140	14	44	125	270	530	1100	1750
				200	11	37	95	220	430	900	1450
							times of Nom				
Emergency Stop Torque	e T _{2NOT}	N•m			(*	Max. Output	Torque T _{2B} =6	0% of Emerg	ency Stop To	orque)	
Nominal Input Speed	d n _{in}	rpm	1,2	3-200	5000	5000	4000	4000	3000	3000	2000
Max. Input Speed n ₁	1max	rpm	1,2	3-200	10000	10000	8000	8000	6000	6000	4000
Micro Backlash P0	,	arcmin	1	3-20	-	-	≦3	≦ 2	≦2	≦2	≦ 2
IVIICIO Backiasti Po)	arcillili	2	15-200	-	-	≦ 5	<u>≤</u> 4	<u>≤</u> 4	<u>≤</u> 4	<u>≤</u> 4
Precision Backlash F	P1	arcmin	1	3-20	≦ 5	≦ 5	≦ 5	≤ 4	≤ 4	≤ 4	≤ 4
Trecision Backasin			2	15-200	<u>≤</u> 7	<u>≤</u> 7	<u>≤</u> 7	<u>≤</u> 7	<u>≤</u> 7	<u>≤</u> 7	<u>≤</u> 7
Standard Backlash I	P2	arcmin	1 2	3-20 15-200	≦7 ≦9	≦7 ≦9	≦ 7 ≦ 9	≦ 6 ≦ 9	≦ 6 ≦ 9	≦ 6 ≦ 9	≦ 6 ≦ 9
Torsional Rigidity	1	N•m /arcmin	1,2	3-200	6	12	30	80	150	450	1000
Max. Bending Moment	t M _{2kB} ¹	N∙m	1,2	3-200	43	125	288	503	1470	2950	6500
Max. Axial Load F _{2a}	1 aB	N	1,2	3-200	1015	1340	2868	3890	9850	12560	21850
Operating Temp.		°C		3-200			-	10°C ~ +90°C			
Service Life		hr		3-200			20,000 (10,00	0 Continuou:	s Operation)		
Efficiency		%	1 2	3-20 15-200				≧ 95% ≥ 92%			
Weight		بميا	1	3-20	1.1	2.3	6.6	13.5	25.1	50	85
vveignt		kg	2	15-200	1.6	3.2/2.2	8.6/5.3	14.8	26.7	55	88
Mounting Position	n	-	1,2	3-200				Any Direction			
Noise Level 2		dBA/1m	1,2	3-200	62	64	66	68	70	72	74
Protection Class -		-	1,2	3-200				IP65			
Lubrication -		1,2	3-200			Svn	thetic Lubrica	ant			
					Ine	rtia (J1)	,				
Stage	ge Ratio unit			PHFR42	PHFR60	PHFR90	PHFR115	PHFR142	PHFR200	PHFR255	
9		5/7/9	- 41		0.06	0.40	2.28	6.87	24.2	69.8	138.2
1		14/20			0.05	0.30	1.45	4.76	14.5	50.3	103.6
Stage		atio	kg•	cm²	PHFR42	PHFR60(T)	PHFR90(T)	PHFR115T	PHFR142T	PHFR200T	PHFR255T
<u> </u>)/25/35			0.06	0.40 (0.08)	2.28 (0.72)	3.02	7.83	27.7	80.3
2		hers			0.05	0.30 (0.06)	1.45 (0.38)	1.64	5.00	15.9	55.3

^{* 1.} Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.



^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio = 100 (2-stage). **The above figures/specifications are subject to change without prior notice.

PHL

PHL premium high precision gearboxes are square mounting flange, caged premium class helical planetary gears in an in-line housing through sizes 90. High torque capacity, quiet operation with backlash as low as <1 arc-min. The PHL high-precision planetary gearbox series have excellent product characteristics such as high efficiency, precision, reliability and long service life, and is most suitable for high-performance applications of precise positioning and high dynamic motion control, such as printing machinery, automation, robotics, etc.

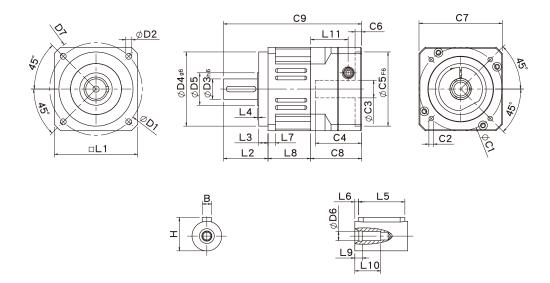


Frame Size (mm)	42, 60, 90
Ratio	3:1-100:1
Nominal Input Speed (rpm)	4000 - 5000
Max Input Speed (rpm)	8000 - 10000
Backlash (arc-min)	1 Stage : 1 - 5 2 Stages : 3 - 7
Noise Level (dBA / 1m)	56 - 60

Features

- ► Backlash as low as 1 arc-min, ultimate performance.
- ► One-piece planet carrier/output shaft, high rigidity and radial load capacity.
- ► Hardened and ground gearing, high wear resistance and impact toughness.
- ➤ One-piece ring gear/housing, high precision and torque output.
- ▶ Planets with full needle bearing support.
- ▶ IP65 enclosure and synthetic lubricant, maintenance-free service life.

PHL Single Stage Dimensions



Specifications

Unit:mm

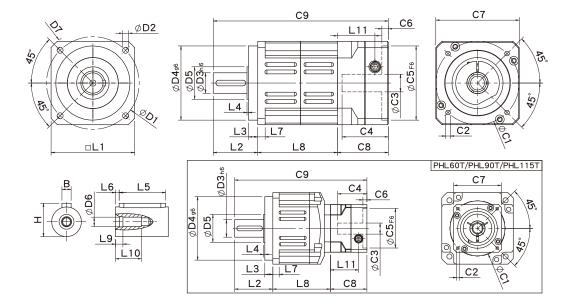
Dimensions	PHL42	PHL60	PHL90
D1	50	70	100
D2	3.4	5.5	6.5
D3h6	13	16	22
D4 ₉₆	35	50	80
D5	15	25	35
D6	M4x0.7P	M5x0.8P	M8x1.25P
D7	56	80	118
L1	42.6	60	90
L2	26	37	48
L3	5.5	7	10
L4	1	1.5	1.5
L5	15	25	32
L6	2	2	3
L7	4	6	8
L8	28.3	37	46
L9	4	4	4.5
L10	14	16.5	20.5
L11	29	35.5	40.5
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	≦8/≦11	<u>≤</u> 14	<u>≤</u> 19/ <u>≤</u> 24
C4 ²	27	37	47
C5 ² F6	30	50	70
C6 ²	4	4	6
C7 ²	42.6	60	90
C8 ²	38.5	46	55
C9 ²	92.8	120	149
В	5	5	6
Н	15	18	24.5

 $[\]bigstar$ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]bigstar$ Specification subject to change without notice.



PHL Double Stage Dimensions



Specifications Unit:mm

Dimensions	PHL42	PHL60	PHL60T	PHL90	PHL90T
D1	50		0	10	00
D2	3.4	5	.5	6.5	
D3h6	13	1	.6	2	2
D4 _{g6}	35	5	0	8	0
D5	15	2	!5	3	5
D6	M4x0.7P	M5>	0.8P	M8x2	L.25P
D7	56	8	30	13	L8
L1	42.6	6	0	9	0
L2	26	_	57	4	8
L3	5.5		7	1	0
L4	1.5	1	.5	1	.5
L5	15	2	!5	32	
L6	2		2	3	
L7	4		6	3	3
L8	55.3	70	65.5	86	78.5
L9	4		4	4.5	
L10	14	16	5.5	20.5	
L11	29	35.5	29	40.5	35.5
C1 ²	46	70	46	90	70
C2 ²	M4x0.7P	M5x0.8P	M5x0.8P	M6x1.0P	M5x0.8P
C3 ²	≦8/≦11	≦14	≦8/≦11	≦19/≦24	<u>≦</u> 14
C4 ²	27	37	27	47	37
C5 ² F6	30	50	30	70	50
C6 ²	4	4	4	6	4
C72	42.6	60	42.6	90	60
C8 ²	38.5	46	38.5	55	46
C9 ²	119.8	153	141	189	172.5
В	5		5	(5
Н	15	1	.8	24	ł.5

 $[\]star$ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

[★] Specification subject to change without notice.

PHL Specifications

Specifications		Stage	Ratio	PHL42	PHL60	PHL90
			3	19	53	145
			4	20	55	150
			5 6	17 15	54 46	140 135
		1	7	14	44	125
			8	12	41	110
			9	11	37	95.0
			10	11	37	95.0
Nominal Output Torque	e T _{2N} N•m	Stage	Ratio	PHL42	PHL60(T)	PHL90(T)
			15	19	53	145
			20 25	20	55 54	150 140
			30	17	54 	140
			35	17	54	140
		2	40	17	54	140
			45	17	54	140
			50	17	54	140
			60	15	46	135
			70	14	44	125
			80 90	12	41 37	110 95.0
			100	11	37	95.0
			100		ominal Output Torqu	
Emergency Stop Torque	T _{2NOT} N•m		(*1	Max. Output Torque T _{2B}	=60% of Emergency	Stop Torque)
Nominal Input Speed	n _{in} rpm	1,2	3-100	5000	5000	4000
Max. Input Speed n _{in}	nax rpm	1,2	3-100	10000	10000	8000
		1	3-10	≦1	<u>≤</u> 1	<u>≦</u> 1
Micro Backlash P0	arcmin	2	15-100	_ ≤3	_ ≦3	_ ≦3
		1	3-10	≤ 3	<u>≦</u> 3	≦3
Precision Backlash P	1 arcmin	2	15-100	≦ 5	_ ≦ 5	_ ≦ 5
Charada ad Da alda ala D	2	1	3-10	<u>≤</u> 5	<u>≦</u> 5	<u>≤</u> 5
Standard Backlash P.	2 arcmin	2	15-100	<u>≤</u> 7	<u>≤</u> 7	≦ 7
Torsional Rigidity	N•m /arcmin	1,2	3-100	2.5	6	12
Max. Radial Load F _{2rB}	1 N	1,2	3-100	760	1570	2780
Max. Axial Load F _{2aB}	¹ N	1,2	3-100	410	750	1870
Operating Temp.	°C		3-100		-10°C ~ +90°C	
Service Life	hr		3-100	20.000 (1	.0,000 Continuous Op	peration)
		1	3-10	25,550 (3	≥ 97%	,
Efficiency	%	2	15-100		≥ 97 % ≥ 94%	
\A/-:l-+		1	3-10	0.6	1.3	3.5
Weight	kg	2	15-100	0.9	2.0/1.6	5.6/3.9
Mounting Position	-	1,2	3-100		Any Direction	,
Noise Level ²	dBA/1m	1,2	3-100	56	58	60
Protection Class				30		
	-	1,2	3-100		IP65	
Lubrication	-	1,2	3-100		Synthetic Lubricant	
			In	ertia (J1)		
Stage	Ratio		unit	PHL42	PHL60	PHL90
	3			0.03	0.23	0.97
	4			0.02	0.18	0.67
1	5			0.02	0.17	0.65
	6/7/8			0.02	0.14	0.60
	9/10		kg •cm²	0.02	0.14	0.58
Stage	Ratio		J	PHL42	PHL60(T)	PHL90(T)
0.090	15/20/25			0.02	0.17 (0.02)	0.65 (0.17)
2	30/35/40			0.02	0.17 (0.02)	0.60 (0.14)
-	45/50/60/70/80/90/	100		0.02	0.14 (0.02)	0.58 (0.14)
	13, 30, 00, 10,00, 30,	100		0.02	0.14 (0.02)	0.36 (0.14)

 $[\]star$ 1. Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.



^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio = 100 (2-stage).

^{*}The above figures/specifications are subject to change without prior notice.

PNS

The PNS Primary Series round mounting flange, caged standard class planetary gears in an in-line housing through sizes 160. High torque capacity, quiet operation with backlash levels as low as <5 arc-min. Maximum ratio 1000:1. Right angle model (PNSR) is available with frame size up to 120 mm.

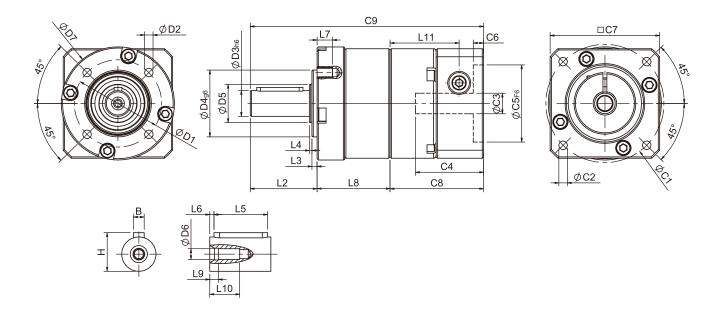


Frame Size (mm)	40, 60, 80, 120, 160
Ratio	3:1 - 1000:1
Nominal Input Speed (rpm)	2,500 - 4,000
Max Input Speed (rpm)	4,000 - 6,000
Backlash (arc-min)	1 Stage: 5 - 9 2 Stages: 7 - 12 3 Stages: 10 - 15
Noise Level (dBA / 1m)	60 - 68

Features

- ► In-line Configuration.
- ▶ Output shaft, 10 mm through 40 mm diameter.
- ► Torque Capacity Range: 8 Nm through 490 Nm.
- ► Caged Planet Carrier: with standard planet gear set.
- ► High performance, efficiencies and low acoustics.
- ▶ Wide Range of Ratios: 6 single stage ratios, 10 two-stage ratios and up to 9 three-stage ratios.
- ▶ Output Bearings deliver radial load capacity as high as 6720 N, and axial capacities up to 4200 N.
- ➤ Square Servo and Step Motor input: accommodates 40 mm through 140 mm, with optional sizes available.

PNS Single Stage Dimensions



Specifications Unit:mm

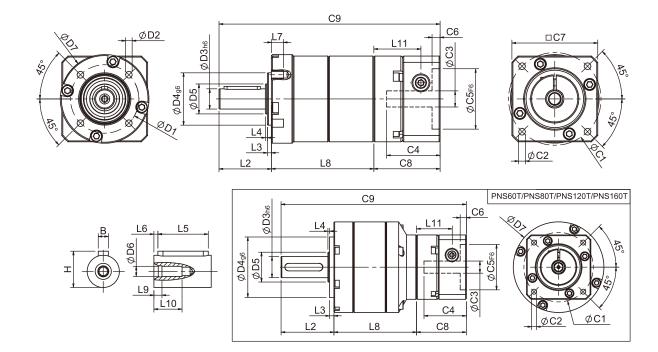
Dimensions	PNS40	PNS60	PNS80	PNS120	PNS160
D1	34	52	70	100	145
D2	M4x0.7P	M5x0.8P	M6x1.0P	M10x1.5P	M12x1.75P
D3h6	10	14	20	25	40
D4 ₉₆	26	40	60	80	130
D5	15	20	35	40	50
D6	M3x0.5P	M5x0.8P	M6x1.0P	M10x1.5P	M16x2.0P
D7	44	60	90	116	160
L2	26	35	40	55	87
L3	2	3	3	4	5
L4	1	1	1	1	2
L5	18	25	28	40	65
L6	2.5	2.5	4	5	8
L7	6	8	10	15	20
L8	28.4	34.4	42.2	68.8	81
L9	3	4	4.5	6	6
L10	9	16.5	16.5	26	38
L11	26.9	31.6	37.3	51.8	63
C1 ²	46	70	90	145	130
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P
C3 ²	≦8/≦11	<i>≦</i> 14/ <i>≦</i> 19	<u>≤</u> 19/ <u>≤</u> 24/ <u>≤</u> 28	<u>≤</u> 24/ <u>≤</u> 32/ <u>≤</u> 38	<i>≦</i> 35/ <i>≦</i> 38
C4 ²	26.5	33.5	41	51.5	66.5
C5 ² F6	30	50	70	110	110
C6 ²	4	4	6	6	5.5
C7 ²	42.6	60	90	130	140
C8 ²	36.4	42.1	51.5	68	80
C9 ²	90.8	111.5	133.7	191.8	248
В	3	5	6	8	12
Н	11.2	16	22.5	28	43

 $[\]star$ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]star$ Specification subject to change without notice.



PNS Double Stage Dimensions



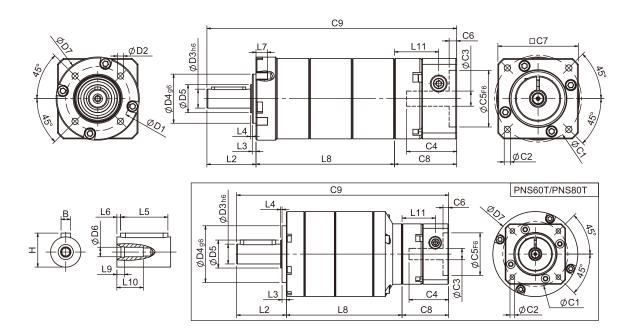
Specifications Unit:mm

Dimensions	PNS40	PNS60	PNS60T	PNS80	PNS80T	PNS120T	PNS160	PNS160T
D1	34	5	52	7	70		145	
D2	M4x0.7P	M5>	(0.8P	M6x	M6x1.0P		M12x1.75P	
D3h6	10	1	.4	2	0	25	4	0
D4 _{g6}	26	۷	10	6	0	80	1.	30
D5	15	2	20	3	5	40	5	0
D6	M3x0.5P	M5>	(0.8P	M6x	1.0P	M10x1.5P	M16	x2.0P
D7	44	6	50	9	0	116	1	50
L2	26	3	35	4	0	55	8	7
L3	2		3	3	3	4		5
L4	1		1	1	-	1		2
L5	18	2	25	2	8	40	65	
L6	2.5	2	5	4		5	8	
L7	6		8	10		15	20	
L8	50.85	61.4	54.7	76	71.5	106.9	142	129
L9	3		4	4.	5	6	(5
L10	9	16	6.5	16.5		26	3	8
L11	23.4	31	23.4	37.3	31	37.3	63	42
C1 ²	46	70	46	90	70	90	130	115
C2 ²	M4x0.7P	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P
C3 ²	≦8/≦11	≦14/≦19	≦8/≦11	<u>≤19/≤24/≤28</u>	≦14/≦19	<u>≤</u> 19/ <u>≤</u> 24/ <u>≤</u> 28	<u>≦</u> 35/ <u>≦</u> 38	<u>≤</u> 24/ <u>≤</u> 28
C4 ²	26.5	33.5	26.5	41	33.5	41	66.5	53.5
C5 ² F6	30	50	30	70	50	70	110	95
C6 ²	4	4	4	6	4	6	5.5	5.5
C7 ²	42.6	60	42.6	90	60	90	140	120
C8 ²	32.9	41.5	32.9	51.5	41.5	51.5	80	58
C9 ²	109.75	137.9	122.6	167.5	153	213.4	309	274
В	3		5	()	8	1	2
Н	11.2	1	.6	22	.5	28	4	.3

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

[★] Specification subject to change without notice.

PNS Triple Stage Dimensions-1



Specifications

Unit:mm

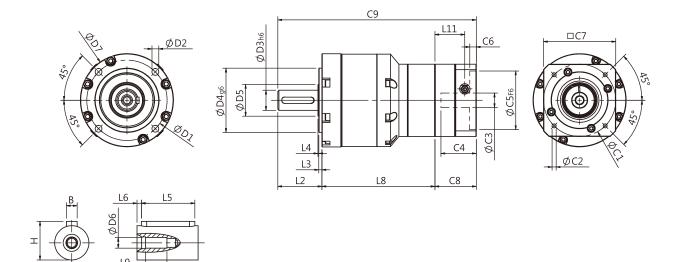
Dimensions	PNS40	PNS60T	PNS80T
D1	34	52	70
D2	M4x0.7P	M5x0.8P	M6x1.0P
D3h6	10	14	20
D4 _{g6}	26	40	60
D5	15	20	35
D6	M3x0.5P	M5x0.8P	M6x1.0P
D7	44	60	90
L2	26	35	40
L3	2	3	3
L4	1	1	1
L5	18	25	28
L6	2.5	2.5	4
L7	6	8	10
L8	73.3	81.7	105.3
L9	3	4	4.5
L10	9	16.5	16.5
L11	23.4	23.4	31
C1 ²	46	46	70
C2 ²	M4x0.7P	M4x0.7P	M5x0.8P
C3 ²	<u>≤</u> 8/ <u>≤</u> 11	≦8/≦11	<i>≦</i> 14/ <i>≦</i> 19
C4 ²	26.5	26.5	33.5
C5 ² F6	30	30	50
C6 ²	4	4	4
C7 ²	42.6	42.6	60
C8 ²	32.9	32.9	41.5
C9 ²	132.2	149.6	186.8
В	3	5	6
Н	11.2	16	22.5

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]star$ Specification subject to change without notice.



PNS Triple Stage Dimensions-2



Specifications

Unit:mm

Dimensions	PNS120T	PNS160T
D1	100	145
D2	M10x1.5P	M12x1.75P
D3h6	25	40
D4 ₉₆	80	130
D5	40	50
D6	M10x1.5P	M16x2.0P
D7	116	160
L2	55	87
L3	4	5
L4	1	2
L5	40	65
L6	5	8
L7	15	20
L8	140.7	177
L9	6	6
L10	26	38
L11	37.3	42
C1 ²	90	115
C2 ²	M6x1.0P	M8x1.25P
C3 ²	≦19/≦24/≦28	24/≦28
C4 ²	41	53.5
C5 ² F6	70	95
C6 ²	6	5.5
C72	90	120
C8 ²	51.5	58
C9 ²	247.2	322
В	8	12
Н	28	43

 $[\]bigstar \ \text{C1}{\sim}\text{C9} \ \text{are motor specific dimensions (metric std shown)}. \ \text{Size may vary according to motor flange}.$

 $[\]bigstar$ Specification subject to change without notice.

PNS Specifications

Spe	ecifications		Stage	Ratio	PNS40	PNS60	PNS-80	PNS-120	PNS-160	
-1		l		3	9		85	200	420	
				4	10	28 32	80	200	490	
				5	11	35	95	215	473	
			1	7	10	28	85	200	400	
				9	8	23	75	195	320	
				10	8	21	65	180	320	
			_			PNS60/	PNS80/		PNS160/	
			Stage	Ratio	PNS40	PNS60T	PNS80T	PNS-120T	PNS160T	
				15	11	35/24	95/68	168	420	
				20	11	35/31	95/95	215	490	
				25	11	35/30	95/95	215	473	
			_	35	11	35/28	95/95	215	473	
Nominal Out	put Torque T _{2N}	N•m	2	45	11	35/27	95/92	215	473	
				50	(Ratio 49) : 10	35/27	95/82	205	473	
				70	(Ratio 63) : 10	28/28	85/85	200	400	
				90	(Ratio 81) : 8	23/23	75/75	195	320	
				100	8	21/21	65/65	180	320	
			Stage	Ratio	PNS40	PNS60T	PNS80T	PNS120T	PNS160T	
				125	11	35	95	215	473	
				175	11	35	95	215	473	
				225	11	35	95	215	473	
				245	11	35	95	215	(Ratio 250): 473	
			3	315	11	35	95	215	(Ratio 350): 473	
				405	11	35	95	215	(Ratio 400): 473	
				567	10	28	85	200	(Ratio 500) : 473	
				729	8	23	75	195	(Ratio 700) : 400	
				1000	8	21	65	180	320	
				1000	(2.5	times of Nomi	nal Output Torc	1100	320	
Emergency St	op Torque T _{2NOT}	N•m		(*	(2.5 Max. Output To	rque $T_{2B} = 60\%$ c	of Emergency S	top Torque)		
Nominal Inp	out Speed n _{IN}	rpm	1,2,3	3-1000	4000	4000	3000	2500	2500	
Max. Input	t Speed n _{1max}	rpm	1,2,3	3-1000	6000	6000	6000	5000	4000	
		arcmin N•m	arcmin	1	3-10	<u>≦</u> 9	≦8	<u>≤</u> 7	<u>≤</u> 6	<u>≤</u> 5
Standard	Backlash P2			2	15-100	<u></u> ≦12	<u>≤</u> 10	 ≦9	≦8	<u>-</u> = 7
Staridara	Dacklasti i 2		3	125~1000	<u>===</u> <u>≦</u> 15	<u>≡</u> 12	= 5 ≤12	<u>=</u> 5 ≤12	<u>=</u> 10	
	al Rigidity	/arcmin	1,2,3	3-1000	1.2	3.5	8.5	17	30	
Max. Radi	al Load F _{2rB} ¹	N	1,2,3	3-1000	580	890	2050	4370	6720	
	al Load F _{2aB} ¹	N	1,2,3	3-1000	410	430	1100	2630	4200	
	ng Temp.	°C	1,2,3	3-1000			-10°C ~ +90°C			
Servi	ice Life	hr	1,2,3	3-1000		20,000 (10,0	000 Continuous	Operation)		
			1	3-10			≥ 95%			
Effic	ciency	%	2	15-100			≥ 90%			
			3	125~1000			≥ 85%			
		.	1	3-10	0.5	1.1	2.8	6.3	6.6	
We	eight	kg	2	15-100	0.7	1.5/1.3	4.2/3.1	7.9	20.7/11.2	
			3	125~1000	0.8	1.7	4.5	9.3	22.4	
Mountin	g Position		1,2,3	3-1000			Any Direction			
Noise	Level ²	dBA/1m	1,2,3	3-1000	60	63	66	67	68	
Protect	ion Class	-	1,2,3	3-1000			IP65			
Lubri	ication	-	1,2,3	3-1000		Sy	nthetic Lubrica	nt		
					Inertia (J1)					
Stage	Ratio)		unit	PNS40(φ8)	PNS60(φ14)	PNS80(φ19)	PNS120(φ24)	PNS160(φ35)	
	3				0.04	0.23	0.77	2.30	7.89	
1	4				0.03	0.21	0.67	1.92	5.83	
-	5~10)			0.03	0.21	0.61	1.71	5.38	
						PNS60(φ14)	PNS80(φ19)		PNS160(φ35)	
Stage	Ratio)		kg•cm²	PNS40(φ8)	PNS60T(φ8)	PNS80T(φ14)	PNS120T(φ19)	PNS160T(φ24)	
2	15				0.04	0.23/(0.04)	0.77/(0.23)	0.77	5.38/(1.61)	
2	Other R	atios			0.03	0.21/(0.03)	0.61/(0.21)	0.61	5.38/(1.61)	
Stage	Ratio				PNS40(φ8)	PNS60T(φ8)	PNS-80T(\phi14)	PNS120T(φ19)	PNS160T(φ24)	
3					0.03	0.03	0.21	0.61	1.61	
	All Ratios		00 410 100		0.05	0.03	0.21	1 0.01	1.01	

^{* 1.} Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.



^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio =

^{*}The above figures/specifications are subject to change without prior notice.



PNSQ Planetary Gearboxes



Single Stage



Double Stage



Triple Stage

Features

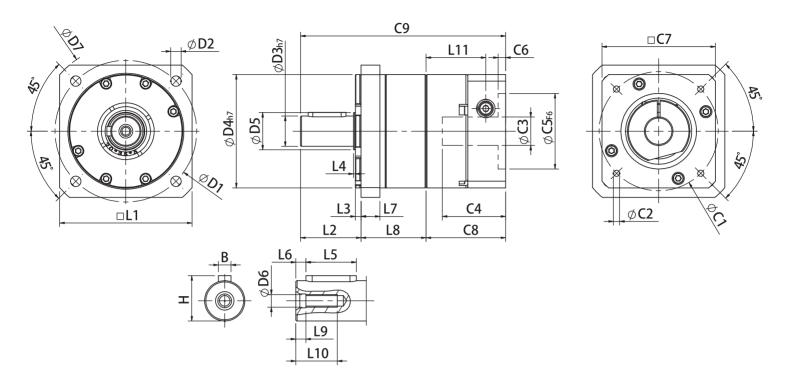
- In-line configuration with square type output flange
- Torque capacity range: 19.2 Nm through 215 Nm
- Wide range of ratios up to 1000:1
- Output bearings deliver radial load capacity from 890 N to 4370 N
- High efficiencies and low acoustics
- Service-life lubricant, maintenance free

SESAME MOTOR CORP.

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PNSQ Single Stage Dimensions



Specifications Unit: mm

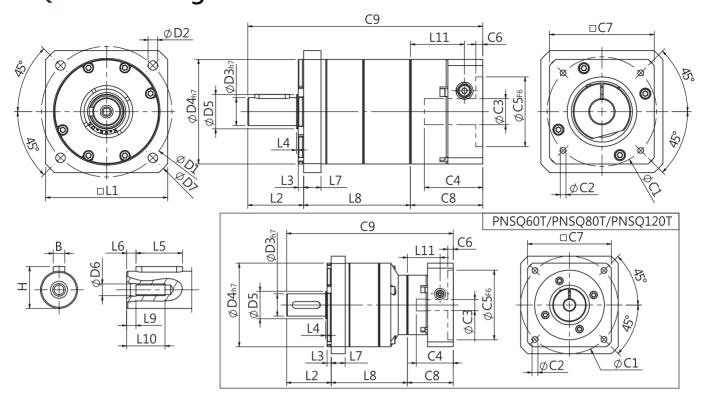
Dimensions	PNSQ60	PNSQ80	PNSQ120
DIIIICIISIONS	75	100	130
D2	5.5	6.5	9
D3 _{h7}	16	20	25
D4 _{h7}	60	80	110
D5	20	35	40
D6	M5x0.8P	M6x1.0P	M10x1.5P
D7	92	116	148
L1	70	90	115
L2	32	40	55
L3	3	3	4
L4	1	1	1
L5	20	28	40
L6	4	4	5
L7	10	10	20
L8	34.4	42.2	68.8
L9	4	4.5	6
L10	16.5	16.5	26
L11	31.6	37.3	51.8
C1 ²	70	90	145
C2 ²	M5x0.8P	M6x1.0P	M8x1.25P
C3 ²	≦14/≦19	<i>≦</i> 19/ <i>≦</i> 24/ <i>≦</i> 28	<u>≤</u> 24/ <u>≤</u> 32/ <u>≤</u> 38
C4 ²	33.5	41	51.5
C5 ² _{F6}	50	70	110
C6 ²	4	6	6
C7 ²	60	90	130
C8 ²	42.1	51.5	68
C9 ²	108.5	133.7	191.8
В	5	6	8
Н	18	22.5	28



 $[\]star$ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]star$ Specification subject to change without notice.

PNSQ Double Stage Dimensions



Specifications Unit: mm

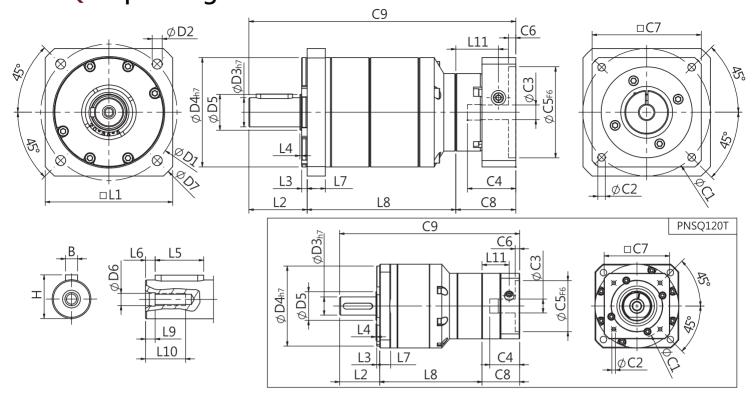
Dimensions	PNSQ60	PNSQ60T	PNSQ80	PNSQ80T	PNSQ120T
D1	7	5	10	100	
D2	5.	.5	6.	5	9
D3h7	1	6	2	0	25
D4 _{h7}	6	0	8	0	110
D5	2	0	3	5	40
D6	M5x	0.8P	M6x	1.0P	M10x1.5P
D7	9	2	11	L 6	148
L1	7	0	9	0	115
L2	3		4	0	55
L3	3	3	3	3	4
L4		L	1	L	1
L5	2	0	2	40	
L6	4	1	4		5
L7	1	0	10		20
L8	61.4	54.7	76	71.5	106.9
L9	4	1	4.5		6
L10	16	5.5	16.5		26
L11	31	23.4	37.3	31	37.3
C1 ²	70	46	90	70	90
C2 ²	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.80P	M6x1.0P
C3 ²	<i>≦</i> 14/ <i>≦</i> 19	≦8/≦11	<i>≦</i> 19/ <i>≦</i> 24/ <i>≦</i> 28	≦14/≦19	≦19/≦24/≦28
C4 ²	33.5	26.5	41	33.5	41
C5 ² _{F6}	50	30	70	50	70
C6 ²	4	4	6	4	6
C7 ²	60	42.6	90	60	90
C8 ²	41.5	32.9	51.5	41.5	51.5
C9 ²	134.9	119.6	167.5	153	213.4 8
В		5		6	
Н	1	8	22	2.5	28

 $[\]star$ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.



[★] Specification subject to change without notice.

PNSQ Triple Stage Dimensions



Specifications Unit: mm

Dimensions	PNSQ60T	PNSQ80T	PNSQ120T
D1	75	100	130
D2	5.5	6.5	9
D3h7	16	20	25
D4 _{h7}	60	80	110
D5	20	35	40
D6	M5x0.8P	M6x1.0P	M10x1.5P
D7	92	116	148
L1	70	90	115
L2	32	40	55
L3	3	3	4
L4	1	1	1
L5	20	28	40
L6	4	4	5
L7	10	10	20
L8	81.7	105.3	140.7
L9	4	4.5	6
L10	16.5	16.5	26
L11	23.4	31	37.3
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	≦8/≦11	<i>≦</i> 14/ <i>≦</i> 19	≦19/≦24/≦28
C4 ²	26.5	33.5	41
C5 ² _{F6}	30	50	70
C6 ²	4	4	6
C7 ²	42.6	60	90
C8 ²	32.9	41.5	51.5
C9 ²	146.6	186.8	247.2
В	5	6	8
Н	18	22.5	28



[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]star$ Specification subject to change without notice.

PNSQ Specifications Table



- Specifications		Stage	Ratio	PNSQ-60	PNSQ-80	PNSQ-120	
Specifications		Stage	3	28	85	200	
			4	32	80	215	
			5	35	95	215	
		1	7	28	85	200	
			8	24	78	197	
			9	23	75	195	
			10	23	65	180	
		Stage	Ratio	PNSQ-60 / PNSQ-60T	PNSQ-80 / PNSQ-80T	PNSQ-120T	
		Stage					
			12 15	32 / 19.2	80 / 54.4	134	
			16	35 / 24 32 / 25.2	95 / 68 80 / 80	168 215	
			20	35 / 31	95 / 95	215	
			25	35 / 30	95 / 95	215	
			32	32 / 22	80 / 76	205	
Nominal Output Torque T2N	N•m	2	35	35 / 28	95 / 95	215	
Trommar Garpar Forque FER	'` '''	_	40	35 / 27.5	95 / 95	215	
			50	35 / 27	95 / 85	205	
			64	24 / 24	78 / 78	197	
			70	28 / 28	85 / 85	200	
			80	24 / 24	78 / 78	197	
			100	21 / 21	65 / 65	180	
		Stage	Ratio	PNSQ-60T	PNSQ-80T	PNSQ-120T	
		Stage	120	35	95	168	
			125	35	95	215	
			160	35	95	215	
			200	35	95	215	
		3	256	32	80	205	
			320	32	80	205	
			512	24	78	197	
			1000	21	65	180	
Max. Output Torque T2B	N•m				gency Stop Torque		
Emergency Stop Torque T _{2NOT}	N•m			2.5 Times of No	minal Output Torque		
		1	3-10	0.11	0.36	0.75	
Starting Torque	N•m	2,3	12-1000	0.11	0.32	0.38	
Nominal Input Speed n _{1N}	rpm	1,2,3	3-1000	4000	3000	2500	
	<u> </u>						
Max. Input Speed n _{1max}	rpm	1,2,3	3-1000	6000	6000	5000	
Character d B. Ll. L. DO		1	3-10	≦8	≦7	≦6	
Standard Backlash P2	arcmin	2	12-100	≦10	<u>≦</u> 9	≦8	
	L	3	120-1000	<u>≤</u> 12	≦12	<u>≤</u> 12	
Torsional Rigidity	N•m /arcmin	1,2,3	3-1000	3.5	8.5	17	
Max. Radial Load F _{2rB} ¹	N	1,2,3	3-1000	890	2050	4370	
Max. Axial Load F _{2aB} ¹	N	1,2,3	3-1000	650	1400	2750	
Operating Temp.	°C	1,2,3	3-1000		-10°C ~ +90°C		
Service Life			3-1000	20,000	(10,000 Continuous Opera	ation)	
Service Life	hr	1,2,3		∠0,000		111011)	
Cfficiana.	0,	1	3-10		≥ 95% > 00%		
Efficiency	%	2	12-100		≥ 90%		
		3	120-1000	4.4	≥ 85%		
NA/ 2 1 -	,	1	3-10	1.1	2.8	6.3	
Weight	kg	2	12-100	1.5/1.3	4.2/3.1	7.9	
		3	120-1000	1.7	4.5	9.3	
Mounting Position		1,2,3	3-1000		Any Direction		
Noise Level ²	dBA/1m	1,2,3	3-1000	60	63	65	
Protection Class	_	1,2,3	3-1000		IP54 (Output Shaft IP65)		
Lubrication	-	1,2,3	3-1000	·			
	<u> </u>	_ · ·		- j			

Inertia(J1)

Stage	Ratio	unit	PNSQ-60(Ø14)	PNSQ-80(Ø19)	PNSQ-120(Ø24)
	3		0.23	0.77	2.30
1	4		0.21	0.67	1.92
	5~10		0.21	0.61	1.71
Stage	Ratio	Va. cm²	PNSQ-60(Ø14) / -60T(Ø8)	PNSQ-80(Ø19) / -80T(Ø14)	PNSQ-120T(Ø19)
2	15	Kg• cm²	0.23/0.04	0.77/0.23	0.77
2	Other ratios		0.21/0.03	0.61/0.21	0.61
Stage	Ratio		PNSQ-60T(Ø8)	PNSQ-80T(Ø14)	PNSQ-120T(Ø19)
3	All ratios		0.03	0.21	0.61

^{1.} Applied to the output shaft center 100 rpm.
2. Measured at 3000 rpm with no load. These values are measured by gearbox with ratio = 100 (2-stage) at nominal input speed or 3000 rpm (if nominal input speed is higher than 3000 rpm) with no load.

X The above figures/specifications are subject to change without prior notice.

PNSR

The PNSR Primary Series right angle round mounting flange, caged standard class planetary gears in a right angle housing through sizes 120. High torque capacity, quiet operation with backlash levels as low as <11 arc-min. Maximum ratio 300:1.



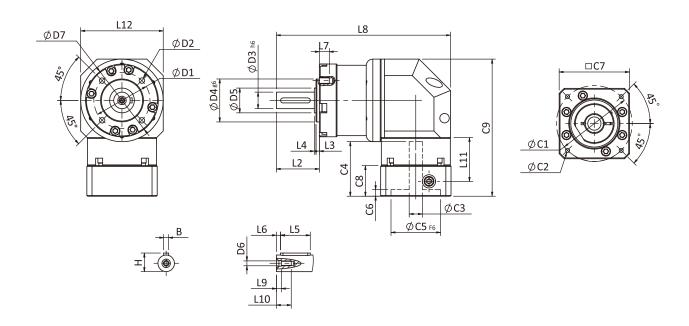
PGFR

Frame Size (mm)	40, 60, 80, 120
Ratio	3:1 - 1000:1
Nominal Input Speed (rpm)	2,500 - 4,500
Max Input Speed (rpm)	5,000 - 7,500
Backlash (arc-min)	1 Stage: 11 - 18 2 Stages: 13 - 20
Noise Level (dBA / 1m)	66 - 73

Features

- ► Right angle configuration.
- ► Torque Capacity Range: 8 Nm through 215 Nm.
- ► Caged Planet Carrier: with standard planet gear set.
- ► High performance, efficiencies and low acoustics.
- ▶ Wide Range of Ratios: 11 single stage ratios, 16 two-stage ratios.
- ► Input adapter for all servo and stepper motors.

PNSR Single Stage Dimensions



Specifications Unit:mm

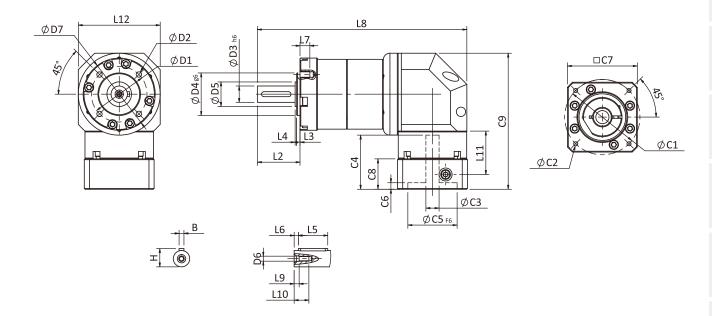
Dimensions	PNSR40	PNSR60	PNSR80	PNSR120
D1	34	52	70	-
D2	M4x0.7P	M5x0.8P	15x0.8P M6x1.0P	
D3h6	10	14	20	-
D4 ₉₆	26	40	60	-
D5	15	20	35	-
D6	M3x0.5P	M5x0.8P	M6x1.0P	-
D7	44	60	90	-
L2	26	35	40	-
L3	2	3	3	-
L4	1	1	1	-
L5	18	25	28	-
L6	2.5	2.5	4	-
L7	6	8	10	-
L8	105.4	139.7	189.2	-
L9	3	4	4.5	-
L10	9	16.5	16.5	-
L11	26.5	36	40.7	-
L12	50	70	98	-
C1 ²	46	70	90	_
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	_
C3 ²	≦8/≦11	≦14/≦19	<u>≤</u> 19/ <u>≤</u> 24	-
C4 ²	33	44	57	-
C5 ² F6	30	50	70	-
C6 ²	4	4	6	-
C7 ²	42.6	60	90	-
C8 ²	18.5	20	26	-
C9 ²	83	111.4	149.2	-
В	3	5	6	-
Н	11.2	16	22.5	-

 $^{^{\}star}2.\ C1{\sim}C9\ are\ motor\ specific\ dimensions\ (metric\ std\ shown).\ Sizes\ may\ vary\ according\ to\ the\ motor\ flange\ chosen.$



PUA

PNSR Double Stage Dimensions-1



Unit:mm Specifications

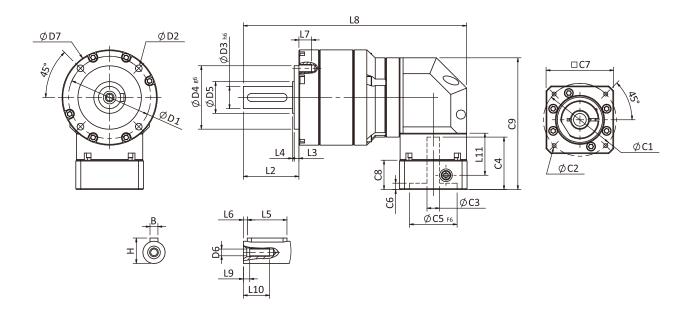
Dimensions	PNSR40	PNSR60	PNSR80	PNSR120
D1	34	52	70	-
D2	M4x0.7P	M5x0.8P M6x1.0P		-
D3h6	10	14	20	-
D4 ₉ 6	26	40	60	-
D5	15	20	35	-
D6	M3x0.5P	M5x0.8P	M6x1.0P	-
D71	44 (45)	60	90	-
L2	26	35	40	-
L3	2	3	3	-
L4	1	1	1	-
L5	18	25	28	-
L6	2.5	2.5	4	-
L7	6	8	10	-
L8	127.9	166.7	223	-
L9	3	4	4.5	-
L10	9	16.5	16.5	-
L11	26.5	36	40.7	-
L12	50	70	98	-
C1 ²	46	70	90	-
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	-
C3 ²	≦8/≦11	<u>≤</u> 14/ <u>≤</u> 19	≦19/≦24	-
C4 ²	33	44	57	-
C5 ² F6	30	50	70	-
C6 ²	4	4	6	-
C7 ²	42.6	60	90	-
C8 ²	18.5	20	26	-
C9 ²	83	111.4	149.2	-
В	3	5	6	-
Н	11.2	16	22.5	-

^{*1.} D7=45 when gear ratios are 100, 200, and 300.

^{*2.} C1~C9 are motor specific dimensions (metric std shown). Sizes may vary according to the motor flange chosen.

 $[\]star$ Specification subject to change without notice.

PNSR Double Stage Dimensions-2



Specifications

Unit:mm

Dimensions	PNSR60T	PNSR80T	PNSR120T
D1	52	70	100
D2	M5x0.8P	M6x1.0P	M10x1.5P
D3h6	14	20	25
D4 ₉₆	40	60	80
D5	20	35	40
D6	M5x0.8P	M6x1.0P	M10x1.5P
D7	60	90	116
L2	35	40	55
L3	3	3	4
L4	1	1	1
L5	25	28	40
L6	2.5	4	5
L7	8	10	15
L8	140.7	181.8	268.9
L9	4	4.5	6
L10	16.5	16.5	26
L11	26.5	36	40.7
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	≦8/≦11	≦14/≦19	≦19/≦24
C4 ²	33	44	57
C5 ² F6	30	50	70
C6 ²	4	4	6
C7 ²	42.6	60	90
C8 ²	18.5	20	26
C9 ²	88	121.4	157.7
В	5	6	8
Н	16	22.5	28

 $^{^{*}2.}$ C1~C9 are motor specific dimensions (metric std shown). Sizes may vary according to the motor flange chosen.

 $[\]star$ Specification subject to change without notice.



PNSR Specifications

	Specifications		Stage	Ratio	PNSR40	PNSR60	PNSR80	PNSR120	
				3	9	28	85	135	
					4	10	32	80	180
				5 7	11 10	35 28	95 85	215	
				8	10	32	80	195	
			1	9	9	25	75	195	
			_	10	11	35	95	210	
				12	10	32	80	-	
				14	10	28	85	200	
				15	11	35	95	-	
				16	8	23	75	195	
Nominal Out	put Torque T _{2N}	N∙m	Stage	Ratio	PNSR40	PNSR60/ PNSR60T	PNSR80/ PNSR80T	PNSR120T	
				20	11	35/31	95/95	215	
				25	11	35/30	95/95	215	
				30	11	35/30	95/95	215	
				35	11	35/28	95/95	215	
				40	11	35/31	95/95	215	
				50	11 11	35/30	95/95	215 215	
			2	60 70	11	35/30 35/28	95/95 95/95	215	
			۷	80	11	35/28	95/95	215	
				100	8	35/27	95/82	205	
				120	11	35/27	95/92	215	
				160	-	23/23	75/75	195	
				200	8	21/21	65/65	180	
				243	8	23/23	75/75	195	
				300	8	21/21	65/65	180	
Emergency St	op Torque T _{2NOT}	N∙m	(2.5 times of Nominal Output Torque) (*Max. Output Torque T ₂₈ =60% of Emergency Stop Torque)				e)		
Nominal Inp	out Speed n _{1N}	rpm	1,2	3-300	4500	4000	3000	2500	
Max. Input	: Speed n _{1max}	rpm	1,2	3-300	7500	7000	6000	5000	
Standard I	Backlash P2	arcmin	1	3-16	<u>≤</u> 18	<u>≤</u> 15	<u>≤</u> 13	≦ 11	
Staridard	Dackiasii P2	arciiiii	2	20-300	≦ 20	<u>≤</u> 17	<u>≤</u> 15	<u>≤</u> 13	
Torsiona	al Rigidity	N•m /arcmin	1,2	3-300	1.2	3.5	8.5	17	
Max. Radi	al Load F _{2rB} ¹	N	1,2	3-300	580	890	2050	4370	
	al Load F _{2aB} ¹	N	1,2	3-300	410	430	1100	2630	
Operati	ng Temp.	°C	1,2	3-300			- +90°C		
Servi	ice Life	hr	1,2	3-300		20,000(10,000 Con	tinuous Operation)	
FCC		0/	1	3-16		≥ 9	5%		
Effic	ciency	%	2	20-300		≥ 9	0%		
			1	3-16	1.0	2.4	6.1	12.2	
We	eight	kg	2	20-300	1.2	2.9/2.7	8.1/6.5	13.8	
Mountin	g Position	<u> </u>	1,2	3-300			rection	1 25.5	
	e Level 2	dR \ /1 m	1,2	3-300	66	68	70	73	
		dBA/1m			00	68 IP		/ 5	
	ion Class	-	1,2	3-300					
Lubri	ication	-	1,2	3-300		Synthetic	Lubricant		
					Inertia (J1)				
Stage	Ratio)		unit	PNSR40(φ8)	PNSR60(φ14)	PNSR80(φ19)	PNSR120(φ24)	
1	3, 4, 5,	. 7			0.07	0.40	2.00	2.7	
-	Other ra	itios			0.05	0.30	1.50	2.2	
Stage	Ratio			kg•cm²	PNSR40(φ8)	PNSR60(φ14)/ PNSR60T(φ8)	PNSR80(φ19)/ PNSR80T(φ14)	PNSR120T(φ19)	
	20, 25,	35			0.07	0.40/0.07	2.0/0.40	2.0	
2			—				· ·		
	Other ra	ILIOS			0.05	0.30/0.05	1.5/0.30	1.5	

^{* 1.} Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio =

^{*}The above figures/specifications are subject to change without prior notice.

PUA

The PUA series of output shaft in-line helical gearbox provide a wide range of performance levels to high positioning accuracy and motion control applications, particularly when high radial loading is required. Frame sizes 60-140 mm with the best level of backlash < 1 arc-min. Maximum radial load capacity up to 11380N (PUA-140), and axial load capacity up to 8830N. The PUA is specially well suited to work with pinion and rack for linear operation. Commonly adapted in metal cutting machines, wood processing equipment, machine centers and highly dynamic motion control systems. The reinforced model PUL series are available with extra high radial loading performance.



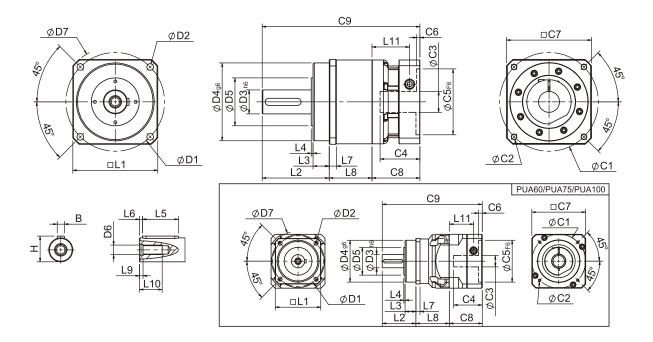
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Frame Size (mm)	60, 75, 100, 140
Ratio	3:1 - 100 : 1
Nominal Input Speed (rpm)	2,500 - 4,000
Max Input Speed (rpm)	4,500 - 6,000
Backlash (arc-min)	1 Stage : 1 - 6 2 Stages : 3 - 8
Noise Level (dBA / 1m)	58 - 65

Features

- ➤ 3 levels of backlash, 4 frame sizes from 60-140 mm.
- ▶ Premium and precision gear design, ratios from 3:1-100:1.
- ► One-piece planet carrier/output shaft, high rigidity and radial load capacity.
- ► Radial load capacity as high as 11380 N, and axial capacities up to 8830 N.
- ► Hardened and ground gearing, high wear resistance and impact toughness.
- ▶ One-piece ring gear/housing, high precision and torque output.
- ► Planets with full needle bearing support.
- ▶ IP65 enclosure and synthetic lubricant, maintenance-free service life.

PUA Single Stage Dimensions



Specifications

Unit:mm

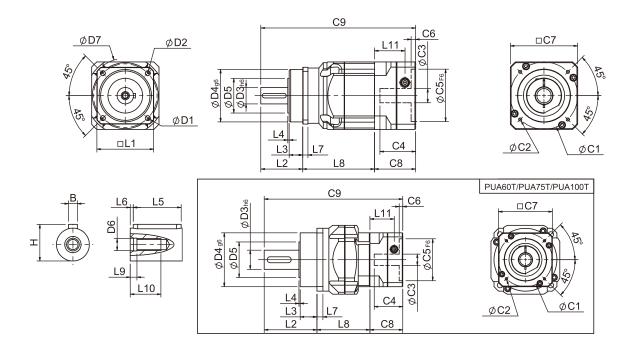
Dimensions	PUA60	PUA75	PUA100	PUA140
D1	68	85	120	165
D2	5.5	6.8	9	11
D3 _{h6}	16	22	32	40
D4 _{g6}	60	70	90	130
D5	34.4	46.4	59.6	79.2
D6	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P
D7	80	100	138	186
L1	62	76	105	142
L2	48.5	56	88	112
L3	18.5	18	28	27
L4	1.5	2	2	3
L5	25	32	40	60
L6	2	2	5	5
L7	6	7	10	12
L8	32.5	56	46	71.5
L9	4	4.5	6	6
L10	16.5	20.5	30	38
L11	35.5	40.5	41.8	62.8
C1 ²	70	90	115	165
C2 ²	M5x0.8P	M6x1P	M8x1.25P	M10x1.5P
C3 ²	<u>≤</u> 14/ <u>≤</u> 19	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 32/ <u>≤</u> 38	<u>≤</u> 35/ <u>≤</u> 38
C4 ²	37	47.8	51	66.5
C5 ² F6	50	70	95	130
C6 ²	4	6	6	5.5
C7 ²	60	90	115	140
C8 ²	46	55	58	80
C9 ²	127	167	192	263.5
В	5	6	10	12
Н	18	24.5	35	43

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

[★] Specification subject to change without notice.



PUA Double Stage Dimensions-1



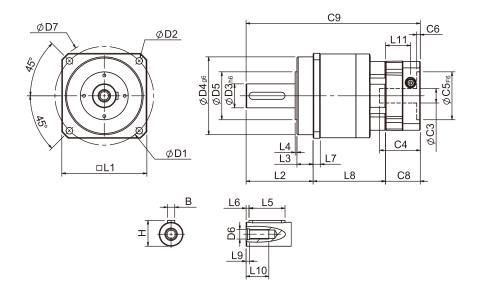
Specifications Unit:mm

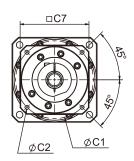
Dimensions	PUA60	PUA60T	PUA75	PUA75T	PUA100T	
D1	(58	3	120		
D2		5.5	6	9		
D3h6	:	16	2	22	32	
D4 ₉₆	(60	7	70	90	
D5	3.	4.4	46	5.4	59.6	
D6	M5x	0.8P	M8x1	25P	M12x1·75P	
D7		30	1	00	138	
L1	(52	7	76	105	
L2	4	8.5		56	88	
L3	1	8.5	1	L8	28	
L4	1	5		2	2	
L5		25	3	40		
L6		2		5		
L7		6	7		10	
L8	65.5	61	96	88.5	88.5	
L9		4	4	4.5		
L10	1	6.5	20.5		30	
L11	35.5	29	40.5	35.5	40.5	
C1 ²	70	46	90	70	90	
C2 ²	M5x0.8P	M4x0.7P	M6x1P	M5x0.8P	M6×1P	
C3 ²	≦14/≦19	≦8/≦14	≦19/≦24	<i>≦</i> 14/ <i>≦</i> 19	≦19/≦24	
C4 ²	37	27	47.8	37	47.8	
$C5^{2}$ F6	50	30	70	50	70	
C6 ²	4	4	6	4	6	
C7 ²	60	42.6	90	60	90	
C8 ²	46	38.5	55	46	55	
C9 ²	160	148	207	190.5	231.5	
В		5		6		
Н		18	24	35		

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]star$ Specification subject to change without notice.

PUA Double Stage Dimensions-2





Specifications

Unit:mm

Dimensions	PUA140T	-	-
D1	165	-	-
D2	11	-	-
D3h6	40	-	-
D4 _{g6}	130	-	-
D5	79.2	-	-
D6	M16x2.0P	-	-
D7	186	-	-
L1	142	-	-
L2	112	-	-
L3	27	-	-
L4	3	-	-
L5	60	-	-
L6	5	-	-
L7	12	-	-
L8	121	-	-
L9	6	-	-
L10	38	_	-
L11	41.8	-	-
C1 ²	130	-	-
C2 ²	M8x1.25P	-	-
C3 ²	<u>≤</u> 24/ <u>≤</u> 32/ <u>≤</u> 38	-	-
C4 ²	51	-	-
C5 ² _{F6}	110	-	-
C6 ²	6	-	-
C72	115	-	-
C8 ²	58	-	-
C9 ²	291	-	-
В	12	-	-
Н	43	-	-

- ★ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.
- \star Specification subject to change without notice.



PUA Specifications

1	40 00 00 60 30 80 30 30 -140T 20 00
1	00 00 60 30 80 30 30 -140T 20
1	00 60 30 80 30 30 -140T
1 6 46 135 280 5 7 44 125 270 5 8 41 110 240 4 9 37 95 220 4 10 37 95 220 4 10 37 95 220 4 Stage Ratio PUA-60/ PUA-75/ PUA-100T PUA- 15 53 145 180 5 20 55 150 240 6 25 54 140 290 66	60 30 80 30 30 -140T 20
Nominal Output Torque T _{2N}	30 80 30 30 - 140T 20
Nominal Output Torque T _{2N}	80 30 30 - 140T 20
9 37 95 220 4 10 37 95 220 4 10 37 95 220 4 Stage Ratio PUA-60/ PUA-75/ PUA-75T PUA-100T PUA-75T 15 53 145 180 5 20 55 150 240 6 25 54 140 290 6	30 30 - 140T 20
10 37 95 220 4	30 - 140T 20 00
Stage Ratio PUA-60/PUA-60T PUA-75/PUA-75T PUA-100T	- 140 T 20 00
Nominal Output Torque T _{2N} N+m	20
Nominal Output Torque T _{2N} N•m 15 53 145 180 5. 20 55 150 240 60 25 54 140 290 60	00
Nominal Output Torque T _{2N} N•m 20 55 150 240 60 25 54 140 290 60	00
25 54 140 290 6	
	vv
30 54 140 290 6	00
	00
40 54 140 290 6	00
2 45 54 140 290 6	00
50 54 140 290 6	00
60 46 135 280 5	60
70 44 125 270 5	30
	80
	30
	30
(3.0 times of Nominal Output Torque)	<u> </u>
Emergency Stop Torque T _{2NOT} N•m (*Max. Output Torque T ₂₈ =60% of Emergency Stop Torque)	
	00
Max. Input Speed n _{1max} rpm 1,2 3-100 6000 6000 5000 45	00
	1
Micro Backlash PU 2 $12-100$ ≤ 4 ≤ 4 ≤ 3 \leq	3
Precision Regulate P1 $\frac{1}{2}$ $\frac{3-10}{4}$ $\frac{4}{2}$	3
Precision Backlash P1 arcmin 2 $12-100$ ≤ 6 ≤ 6 ≤ 5 \leq	5
	5
Standard Backlash P2 $\begin{vmatrix} 1 & 3 & 10 & 10 & 10 & 10 & 10 & 10 & 1$	7
	0
	 380
219	30
2.00	
Operating Temp. °C 3-100 -10°C ~ +90°C	
Service Life hr 3-100 30,000 (15,000 Continuous Operation)	
Efficiency $\%$ $\frac{1}{3}$ $\frac{3-10}{12}$ $\frac{\geq 97\%}{2}$	
2 12-100	
	4.5
2 12-100 2.0/1./ 5.2/4.0 8.1 1	7.5
Mounting Position - 1,2 3-100 Any Direction	
	65
Protection Class - 1,2 3-100 IP65	
Lubrication - 1,2 3-100 Synthetic Lubricant	
Inertia (J1)	
	-140
	.00
0.20 0.07 2.00 7.	<u> 17</u>
	52
	17
9/10 0.14 0.58 1.41 6.	10
Stage Ratio PUA60(T) PUA75(T) PUA100T PUA	140T
	.35
	.45
	41
* 1. Applied to the output shaft center at 100 rpm.	

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio =

^{**}The above figures/specifications are subject to change without prior notice.

PUL

High Radial Load Planetary Gearboxes

The PUL series of output shaft inline helical gearbox provide a wide range of performance levels to high positioning accuracy and motion control applications, particularly when high radial loading is required. The performance of this precision planetary gearbox is reinforced based on the PUA series. The maximum radial force is increased by an average of 155%. Frame sizes 60-220 mm with the best level of backlash < 1 arcmin. Taper roller bearings with maximum radial load capacity up to 27800N (PUL-220), and axial load capacity up to 16200N. The PUL gearboxes are specially well suited to work with pinion and rack for linear operation. Commonly adapted in metal cutting machines, wood processing equipment, machine centers and highly dynamic motion control systems. Right angle configuration (PUR) is also available with max. frame size 220 mm.



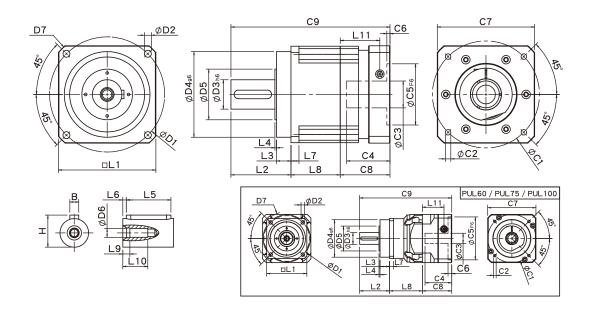
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Frame Size (mm)	60,75, 100, 140, 180, 220
Ratio	3:1 - 100 : 1
Nominal Input Speed (rpm)	2,000 - 5,000
Max Input Speed (rpm)	4,000 - 10,000
Backlash (arc-min)	1 Stage : 1 - 6 2 Stages : 3 - 8
Noise Level (dBA / 1m)	58 - 70

Features

- ➤ 3 levels of backlash, 6 frame sizes from 60-220 mm.
- ▶ Premium and precision gear design, ratios from 3-100:1.
- ➤ One-piece planet carrier/output shaft, high rigidity and radial load capacity.
- ► Taper Roller Bearings deliver radial load capacity as high as 27800 N, and axial capacities up to 16200 N.
- ► Hardened and ground gearing, high wear resistance and impact toughness.
- ➤ One-piece ring gear/housing, high precision and torque output.
- ► Planets with full needle bearing support.
- ▶ IP65 enclosure and synthetic lubricant, maintenance-free service life.

PUL Single Stage Dimensions



Specifications Unit:mm

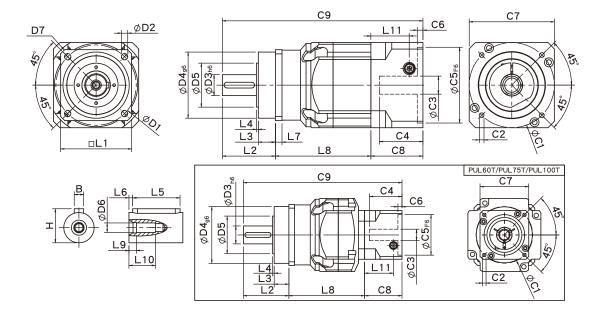
Dimensions	PUL60	PUL75	PUL100	PUL140	PUL180	PUL220
D1	68	85	120	165	215	250
D2	5.5	6.8	9	11	13	17
D3h6	16	22	32	40	55	75
D4 ₉ 6	60	70	90	130	160	180
D5	34.6	46.4	59.6	79.2	94.5	114.4
D6	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	80	100	138	186	239	292
L1	62	76	105	142	180	220
L2	48.5	56	88	112	112	138
L3	18.5	18	28	27	27	30
L4	1.5	2	2	3	3	3
L5	25	32	40	60	70	90
L6	2	2	5	5	6	7
L7	6	7	10	12	15	20
L8	44	61	46	64.5	92	111
L9	4	4.5	6	6	8	15
L10	16.5	20.5	30	38	48	42
L11	35.5	40.5	41.8	70	74	96
C1 ²	70	90	115	165	200	235
C2 ²	M5x0.8P	M6x1.0P	M8x1.25P	M10x1.5P	M12x1.75P	M12x1.75P
C3 ²	≦14/≦19	<i>≦</i> 19/ <i>≦</i> 24	<i>≦</i> 24/ <i>≦</i> 32/ <i>≦</i> 38	<u>≤</u> 35/ <u>≤</u> 38	<u>≤</u> 50	<u>≤</u> 55
C4 ²	37	47	51	66.7	81	112
C5 ² F6	50	70	95	130	114.3	200
C6 ²	4	6	6	5.5	6	6
C72	60	90	115	140	182	220
C8 ²	46	55	58	87.2	93	120
C9 ²	138.5	172	192	263.7	297	369
В	5	6	10	12	16	20
Н	18	24.5	35	43	59	79.5

 $[\]star$ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]bigstar$ Specification subject to change without notice.



PUL Double Stage Dimensions-1



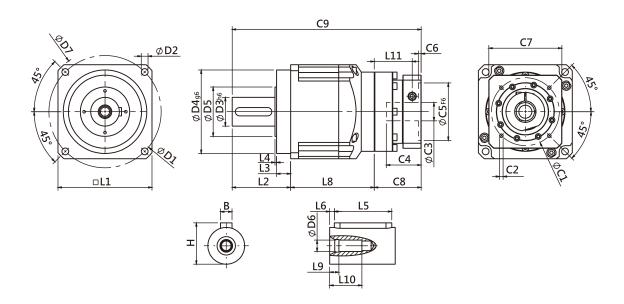
Specifications Unit:mm

Dimensions	PUL60/	PUL60T	PUL75/	PUL100T	
D1	6	8	8	120	
D2	5	.5	6.	9	
D3h6	1	6	2	32	
D4 _{g6}	6	0	7	90	
D5	34	ł.6	46	59.6	
D6	M5x	0.8P	M8x1	M12x1.75P	
D7	8		10		138
L1	6	2	7	6	105
L2	48	3.5	5	6	88
L3	18	3.5	1		28
L4	1	.5	2	2	2
L5		5	3	40	
L6		2	2	5	
L7	6		7	10	
L8	77 72.5		101	93.5	88.5
L9	4		4.5		6
L10	16.5		20.5		30
L11	35.5	29	40.5	35.5	40.5
C1 ²	70	46	90	70	90
C2 ²	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P	M6x1.0P
C3 ²	≦14/≦19	≦8/≦11	≦19/≦24	≦14/≦19	≦19/≦24
C4 ²	37	27	47	37	47
C5 ² F6	50	30	70	70 50	
C6 ²	4 4		6 4		6
C72	60	60 42.6		90 60	
C8 ²	46 38.5		55	55 46	
C9 ²	171.5 159.5		212 195.5		231.5
В	1	5	6	10	
Н	1	8	24	35	

 $[\]star$ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]star$ Specification subject to change without notice.

PUL Double Stage Dimensions-2



Specifications

Unit:mm

Dimensions	PUL140T	PUL180T	PUL220T
D1	165	215	250
D2	11	13	17
D3h6	40	55	75
D4 ₉₆	130	160	180
D5	79.2	94.5	114.4
D6	M16x2.0P	M20x2.5P	M20x2.5P
D7	186	239	292
L1	142	180	220
L2	112	112	138
L3	27	27	30
L4	3	3	3
L5	60	70	90
L6	5	6	7
L7	12	15	20
L8	120	160.2	202
L9	6	8	15
L10	38	48	42
L11	41.8	72.6	74
C1 ²	130	130	200
C2 ²	M8x1.25P	M8x1.25P	M12x1.75P
C3 ²	<u>≤</u> 24/ <u>≤</u> 32/ <u>≤</u> 38	<u>≤</u> 35/ <u>≤</u> 38	<u>≤</u> 50
C4 ²	51	66.7	81
C5 ² F6	110	110	114.3
C6 ²	6	5.5	6
C72	115	140	180
C8 ²	58	89.8	93
C9 ²	290	362	433
В	12	16	20
Н	43	59	79.5

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]bigstar$ Specification subject to change without notice.



PUL Specifications

Specifications		Stage	Ratio	PUL60	PUL75	PUL100	PUL140	PUL180	PUL220	
				3	53	145	180	340	580	1100
				4	55	150	240	500	1100	1700
				5	54	140	290	600	1200	2000
			1	6	46	135	280	560	1100	1850
				7	44	125	270	530	1100	1750
				8	41	110	240	480	1000	1550
				9	37	95	220	430	900	1500
				10	37	95	220	430	900	1450
			Stage	Ratio	PUL60(T)	PUL75(T)	PUL100T	PUL140T	PUL180T	PUL220T
				15	53	145	180	520	1200	2000
Nominal Output To	raue T	N∙m		20	55	150	240	600	1200	2000
	I 2N			25	54	140	290	600	1200	2000
				30	54	140	290	600	1200	2000
				35	54	140	290	600	1200	2000
				40	54	140	290	600	1200	2000
			2	45 50	54 54	140 140	290 290	600 600	1200 1200	2000
				60	46	135	280	560	1200	1850
				70	44	125	270	530	1100	1750
				80	41	110	240	480	1000	1550
				90	37	95	220	430	900	1500
				100	37	95	220	430	900	1450
Emargangy Stan Tar	aus T	NI				(3.0 times o	of Nominal Ou	tput Torque)		
Emergency Stop Tor	que i _{2NOT}	N•m			(*Max. C	Output Torque	$T_{2B} = 60\% \text{ of E}$	mergency Sto	p Torque)	
Nominal Input Spe	eed n _{1N}	rpm	1,2	3-100	5000	4000	4000	3000	3000	2000
Max. Input Speed		rpm	1,2	3-100	10000	8000	8000	6000	6000	4000
Wax. Input Speca II Imax		ТРІП				<u>≤</u> 2				
Micro Backlash	P0	arcmin	1	3-10	≦ 2 ≦ 4		≦1 ≦3	≦1 ≦3	≦1 ≦3	≦1 <2
			2	12-100		<u>≤</u> 4				≦3
Precision Backlas	sh P1	arcmin	1	3-10	≦ 4	≦ 4	≦3	≦3	≦3	≦3
Standard Backlash P2 arcmin			2	12-100	≦6	≦ 6	≦ 5	≦ 5	≦ 5	≦ 5
		arcmin	1 2	3-10 12-100	≦ 6 ≦ 8	≦ 6 ≦ 8	≦ 5 ≦ 7	≦ 5 ≦ 7	≦ 5 ≦ 7	≦ 5 ≦ 7
		1,2	3-100	7	14	25	50	150	220	
To ronal ringra		/arcmin			<u> </u>					
Max. Radial Load F _{2rB} ¹ N		1,2	3-100	4130	5220	10650	17600	22000	27800	
Max. Axial Load	F _{2aB} ¹	N	1,2	3-100	2500	3300	5700	11300	14000	16200
Operating Ten	np.	°C		3-100		-10°C ~ +90°C				
Service Life		hr		3-100		20.00			ration)	
Service Life		111				30,00	00 (15,000 Cor		au(UII)	
Efficiency		%	1 2	3-10 12-100				97% 94%		
			1	3-10	1.8	4.0	6.7		30 0	55
Weight		kg	2	12-100	2.4/2.0	4.0 5.7/4.5	8.2	15.1 17.5	30.8 37	68.5
Mounting Posit	tion		1,2	3-100	2.7/2.0	3.7/4.3		irection	31	00.5
		-ID A (7								70
Noise Level		dBA/1m	1,2	3-100	58	60	63	65	67	70
Protection Cla	iss	-	1,2	3-100			IF	P65		
Lubrication		-	1,2	3-100			Synthetic	Lubricant		
					Inertia (J1)					
Stage Ratio			ļ ir	it	, ,		DI II 100	DI II 140	PUL180	PUL220
1	K				PUL60	PUL75	PUL100	PUL140		
		3 4 5			0.23	0.97	2.35	10.00	30.50	79.50
					0.18	0.67	1.66	7.17	25.86	58.21
	_				0.17	0.65	1.50	6.52	23.63	54.36
		6/7/8		cm²	0.14	0.60	1.45	6.17	22.92	54.12
		9/10	Kg∙	LIII I	0.14	0.58	1.41	6.1	22.73	53.98
Stage		latio			PUL60(T)	PUL75(T)	PUL100T	PUL140T	PUL180T	PUL220T
		5/20			0.17 (0.02)	0.65 (0.17)	0.65	1.50	6.52	30.50
2	25/3	0/35/40			0.14 (0.02)	0.60 (0.14)	0.60	1.45	6.17	22.92
	45/50/60/	70/80/90/100			0.14 (0.02)	0.58 (0.14)	0.58	1.41	6.10	22.73
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1										

 $[\]ast$ 1. Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio =

^{**}The above figures/specifications are subject to change without prior notice.

PUR

High Radial Load Capacity Planetary Gearboxes

The PUR series of output shaft right angle helical gearbox provide a wide range of performance levels to high positioning accuracy and motion control applications, particularly when high precision and high torsional rigidity are required. Frame sizes 60-220 mm with the best level of backlash ≤ 2 arc-min. Taper roller bearings with maximum radial load capacity up to 27800 N, and axial load capacity up to 16200 N. The PUR is specially well suited to work with pinion and rack for linear operation. Commonly adapted in metal cutting machines, wood processing equipment, machine centers and highly dynamic motion control systems. In-line configuration (PUL series) is also available with max. Frame size 220 mm.

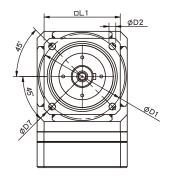


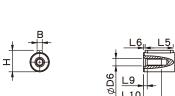
Frame Size (mm)	60, 75, 100, 140, 180, 220
Ratio	3:1 - 200 : 1
Nominal Input Speed (rpm)	2,000 - 5,000
Max Input Speed (rpm)	4,000 - 10,000
Backlash (arc-min)	1 Stage : 2 - 7 2 Stages : 4 - 9
Noise Level (dBA / 1m)	64 - 74

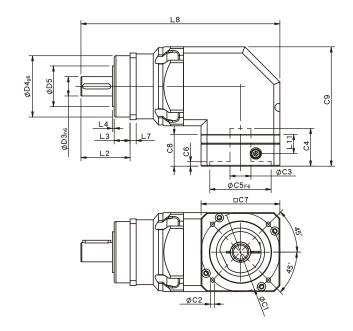
Features

- ➤ 3 Levels of backlash, 6 frame sizes from 60-220 mm.
- ▶ Premium and precision gear design, ratios from 3-200:1.
- ➤ One-piece planet carrier/output shaft, high rigidity and radial load capacity.
- ► Hardened and ground gearing, high wear resistance and impact toughness.
- ➤ One-piece ring gear/housing, high precision and torque output.
- ▶ Planets with full needle bearing support.
- ▶ IP65 enclosure and synthetic lubricant, maintenance-free service life.

PUR Single Stage Dimensions







Specifications Unit:mm

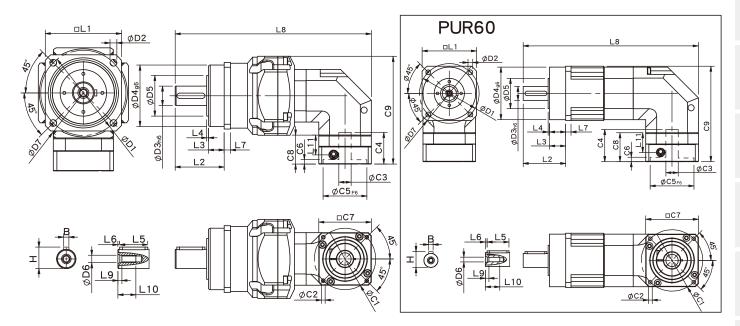
Dimensions	PUR60	PUR75	PUR100	PUR140	PUR180	PUR220
D1 _{H7}	68	85	120	165	215	250
D2	5.5	6.8	9	11	13	17
D3h6	16	22	32	40	55	75
D4 ₉₆	60	70	90	130	160	180
D5	34.4	46.4	59.6	79.2	94.5	114.4
D6	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	80	100	138	186	239	292
L1	62	76	105	142	180	220
L2	48.5	56	88	112	112	138
L3	18.5	18	28	27	27	30
L4	1.5	2	2	3	3	3
L5	25	32	40	60	70	90
L6	2	2	5	5	6	7
L7	6	7	10	12	15	20
L8	166.7	227	260.5	346.2	414.7	490.2
L9	4	4.5	6	6	8	15
L10	16.5	20.5	30	38	48	42
L11	22.5	21.5	31.8	44.7	44	60
C1 ²	70	90	115	145	200	215
C2 ²	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P	M12x1.75P
C3 ²	≦14/≦19	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 32	≦35	≦50	≦55
C4 ²	34	45	53.5	76.8	78.8	98.7
C5 ² F6	50	70	95	110	114.3	180
C6 ²	4	4	6	5.5	6	6
C7 ²	60	90	115	140	180	220
C8 ²	33	36	48	65	65	85
C9 ²	108.8	136	174.5	207	247.5	287.5
В	5	6	10	12	16	20
Н	18	24.5	35	43	59	79.5

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]bigstar$ Specification subject to change without notice.



PUR Double Stage Dimensions



Specifications Unit:mm

Dimensions	PUR60	PUR60T	PUR75T	PUR100T	PUR140T	PUR180T	PUR220T
D1	68	68	85	120	165	215	250
D2	5.5	5.5	6.8	9	11	13	17
D3h6	16	16	22	32	40	55	75
D4 ₉₆	60	60	70	90	130	160	180
D5	34.4	34.6	46.4	59.6	79.2	94.5	114.4
D6	M5x0.8P	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20X2.5P
D7	80	80	100	138	186	239	292
L1	62	62	76	105	142	180	220
L2	48.5	48.5	56	88	112	112	138
L3	18.5	18.5	18	28	27	27	30
L4	1.5	1.5	2	2	3	3	3
L5	25	25	32	40	60	70	90
L6	2	2	2	5	5	6	7
L7	6	6	7	10	12	15	20
L8	199.7	170.3	223.7	286.5	358.5	445.4	537.2
L9	4	4	4.5	6	6	8	15
L10	16.5	16.5	20.5	30	38	48	42
L11	22.5	15.5	22.5	21.5	31.8	44.7	44
C1 ²	70	46	70	90	115	145	200
C2 ²	M5x0.8P	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 ²	<u>≤</u> 14/ <u>≤</u> 19	≦8/≦11	≦14/≦19	≦19/≦24	<u>≤</u> 24/ <u>≤</u> 32	<u>≤</u> 35	<u>≤</u> 50
C4 ²	34	29	34	45	53.5	76.8	78.8
$C5^2$ F6	50	30	50	70	95	110	114.3
C6 ²	4	4	4	6	6	5.5	6
C7 ²	60	42.6	60	90	115	140	180
C8 ²	33	25	33	36	48	65	65
C9 ²	108.8	80.5	122.8	148.5	188	223.5	267.5
В	6	5	6	10	12	16	20
Н	18	18	24.5	35	43	59	79.5

 $[\]star$ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

 $[\]star$ Specification subject to change without notice.

PUR Specifications

Specifications		Stage	Ratio	PUR60	PUR75	PUR100	PUR140	PUR180	PUR220
			3	53	145	180	340	580	950
			4	55	150	240	500	1100	1500
			5	54	140	290	600	1200	1800
		1	7	46 44	135 125	280 270	500	1100 1100	1620 1750
		1	8	41	110	240	530 470	1000	1550
			9	37	95	220	430	900	1500
			10	50	130	260	540	900	1500
			14	44	125	270	530	1100	1750
			20	37	95	220	430	900	1450
		Stage	Ratio	PUR60(T)	PUR75T	PUR100T	PUR140T	PUR180T	PUR220T
			15	53	145	180	600	1200	2000
			20	55	150	240	600	1200	2000
Nominal Output Torque T _{2N}	N•m		25 30	54	140 145	290 180	600 600	1200 1200	2000 2000
			35	54	140	290	600	1200	2000
			40	55	150	240	600	1200	2000
			45	54	140	290	600	1200	2000
			50	54	140	290	600	1200	2000
		2	60	46	135	280	560	1100	1850
			70	44	125	270	530	1100	1750
			90	37	110 95	240 220	480 430	1000 900	1550 1500
			100	37	95 95	220	430	900	1450
			120	46	135	280	560	1100	1850
			140	44	125	270	530	1100	1750
			160	41	110	240	480	1000	1550
			180	37	95	220	430	900	1500
			200	37	95	220	430	900	1450
Emergency Stop Torque T _{2NOT}	N∙m			(*Ma	3.0 tim) ax. Output Tor	es of Nominal C que T ₂₈ =60% of	(Dutput Torque Emergency St	op Torque)	
Nominal Input Speed n _{1N}	rpm	1,2	3-200	5000	4000	4000	3000	3000	2000
Max. Input Speed n _{1max}	rpm	1,2	3-200	10000	8000	8000	6000	6000	4000
		1	3-20	-	≦ 3	≦2	≦ 2	≦ 2	≦2
Micro Backlash P0	arcmin	2	15-200	_	_ ≦ 5	_ ≦4	_ ≦4	_ ≦ 4	_ ≦ 4
		1	3-20	<u>≤</u> 5	<u>≤</u> 5	<u>≤</u> 4	<u>≤</u> 4	<u>≤</u> 4	<u>≤</u> 4
Precision Backlash P1	arcmin	2	15-200	_ ≤7	_ ≦7	_ ≦7	_ ≦7	_ ≦7	_ ≦7
		1	3-20	<u>≤</u> 7	<u> </u>	<u>≤</u> 6	<u>≤</u> 6	<u>≤</u> 6	<u>≤</u> 6
Standard Backlash P2	arcmin	2	15-200	≦9	<u>=</u> . ≦ 9	= 5 ≦ 9	= ° ≦ 9	= ° ≦ 9	= 5 ≦ 9
Torsional Rigidity	N•m /arcmin	1,2	3-200	7	14	25	50	150	220
Max. Radial Load F _{2rB} ¹	N	1,2	3-200	4130	5220	10650	17600	22000	27800
Max. Axial Load F _{2aB} 1	N	1,2	3-200	2500	3300	5700	11300	14000	16200
Operating Temp.	°C		3-200			-10℃	~ +90°C		
Service Life			_		20.	000 (15,000 Con		tion)	
Service Life	hr	1	3-200	-	30,0		'	шопу	
Efficiency	%	1 2	3-20 15-200			≧ 9 ≧ 9	5% 2%		
	1	1	3-20	3.1	5.5	12.5	25.5	46	75
Weight	kg	2	15-200	3.1 3.7(3.3)	5.5 4.9	12.5 13.6	25.5 27	46 50	75 88
Mounting Position	-	1,2	3-200	3.7 (3.3)	7.3		irection		
Noise Level ²	dBA/1m	1,2	3-200	64	66	68	70	72	74
		-	_	57					
Protection Class -		1,2	3-200				65		
Lubrication - 1,2		1,2	3-200	Ton a cost	in (I1)	Synthetic	Lubricant		
Stage D	atio	ur	nit .		ia (J1)	DI ID100	DI ID140	DI ID100	חבבתוות
3	latio	ur	IIL	PUR60	PUR75	PUR100	PUR140	PUR180	PUR220
	/5/7/9	-		0.40	2.28	6.87	24.2	69.8	138.2
	.0/14/20		2	0.30	1.45	4.76	14.5	50.3	103.6
L de ere	latio	∣ kg•	·cm²	PUR60(T)	PUR75T	PUR100T	PUR140T	PUR180T	PUR220T
3		1							
2 15/20/	/25/35/45 thers			0.40 (0.08) 0.30 (0.06)	0.72 0.38	3.02 1.64	7.83 5.00	27.7 15.9	80.3 55.3

^{* 1.} Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.



^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio =

XThe above figures/specifications are subject to change without prior notice.

SGC SGE

The stainless steel planetary gearboxes SGC series and SGE series are specially developed and constructed for use in food, pharmaceutical, chemical, biotechnology, aerospace, anti-magnetic applications and those environments require corrosion protection exist. They are precision in-line servo gearboxes with smooth appearance and permanent laser engraving label to provide outstanding corrosion resistance in wash-down environments. Customized requirements such as high level IP protection or surface treatment are available to apply high temperature and pressure wash-down or hygienic environments. Feel free to contact us for further information.

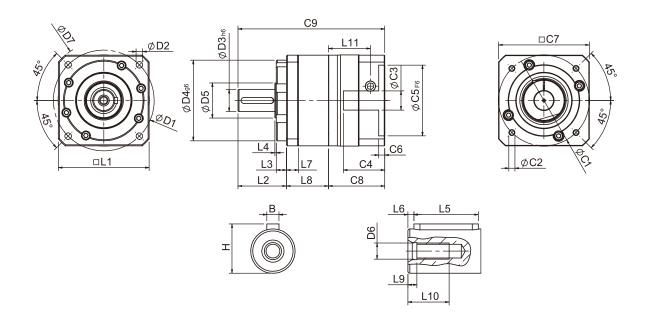


	SGC	SGE		
Frame Size (mm)	50, 70, 90, 120	42, 60, 90, 115		
Ratio	3:1-100:1			
Nominal Input Speed (rpm)	2,500 - 4,000			
Max Input Speed (rpm)	5,000 - 6,000			
Backlash (arc-min)	1 Stage: 6 - 9 2 Stages: 8 -12			
Noise Level (dBA / 1m)	61 - 67			

SGC/ SGE Features

- ➤ Corrosion resistance.
- ➤ One-piece constructed output shaft and gear carrier.
- ► Permanent laser engraving label.
- ► Lubricated for life.
- ► Customization available.
- ➤ Taiwan patent no. M524896.

SGE Single Stage Dimensions



Specifications Unit:mm

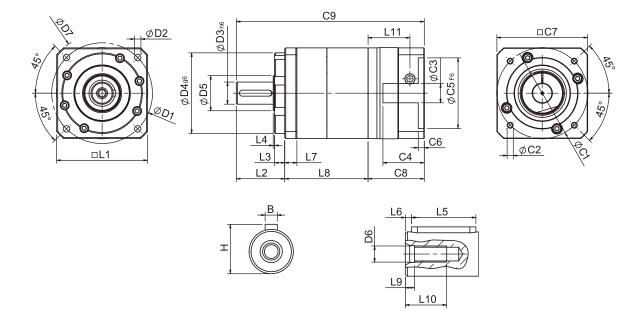
Dimensions	SGE-42	SGE-60	SGE-90
D1	-	70	100
D2	-	5.5	6.5
D3h6	-	16	22
D4g6	-	50	80
D5	-	20	35
D6	-	M5x0.8P	M8x1.25P
D7	-	80	118
L1	-	62.5	90
L2	-	37	48
L3	-	7	10
L4	-	1.5	1.5
L5	-	25	32
L6	-	2	3
L7	-	10	12.1
L8	-	36.3	41.8
L9	-	4	4.5
L10	-	16.5	20.5
L11	-	34.3	41.5
C1 ²	-	70	90
C2 ²	-	M5x0.8P	M6x1.0P
C3 ²	-	<i>≦</i> 14/ <i>≦</i> 19	<u>≤</u> 19/ <u>≤</u> 24/ <u>≤</u> 28
C4 ²	-	33.5	41
C5 ² _{F6}	-	50	70
C6 ²	-	4	6
C72	-	60	90
C8 ²	-	44.8	55.8
C9 ²	-	118.1	145.6
В	-	5	6
Н	-	18	24.5

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.

[★] Specification subject to change without notice.



SGE Double Stage Dimensions



Specifications

Unit:mm

Dimensions	SGE-42	SGE-60	SGE-90
Difficults D1	- 3GE-42	70	100
D2		5.5	6.5
	-		22
D3 h6	-	16	
D4 g6	-	50	80
D5	-	20	35
D6	-	M5x0.8P	M8x1.25P
D7	-	80	118
L1	-	62.5	90
L2	-	37	48
L3	-	7	10
L4	-	1.5	1.5
L5	-	25	32
L6	-	2	3
L7	-	10	12.1
L8	-	66.9	82.7
L9	-	4	4.5
L10	-	16.5	20.5
L11	-	34.3	41.5
C1 ²	-	70	90
C22	-	M5x0.8P	M6x1.0P
C3 ²	-	<u>≤</u> 14/ <u>≤</u> 19	≦19/≦24/≦28
C4 ²	-	33.5	41
C5 ² _{F6}	-	50	70
C6 ²	-	4	6
C72	-	60	90
C8 ²	-	44.8	55.8
C9 ²	-	148.7	186.5
В	-	5	6
Н	-	18	24.5
	I.	1	l

[★] C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.



[★] Specification subject to change without notice.

SGE Specifications

S	pecifications		Stage	Ratio	SGE-42	SGE-60	SGE-90	SGE-115
	peemeations		Juge	3	9	28	85	220
				4	10	32	80	240
				5	11	35	95	270
			1	7	10	28		220
				9	8	23	85	210
				_	8		75	
				10		21	65	190
			Stage	Ratio	SGE-42	SGE-60	SGE-90	SGE-115
Nominal Out	put Torque T _{2N}	N·m		15	11	34	90	250
				20	10	32	80	240
				25	11	35	95	270
			_	35	11	35	95	270
			2	45	11	35	95	270
				49	10	28	85	220
				63	10	28	85	220
				81	8	23	75	210
				100	8	21	65	190
Emergency St	op Torque T _{2NOT}	N·m		(*M	(3.0 t ii ax. Output Torg	mes of Nominal (Jue T _{2B} =60% of E	Output Torque) Emergency Stop	Torque)
Nominal Inp	out Speed n _{1N}	rpm	1,2	3-100	4000	4000	3000	2500
Max. Input	Speed n _{1max}	rpm	1,2	3-100	6000	6000	6000	5000
			1	3-10	<u>≤</u> 9	≤ 8	<u>≦</u> 7	<u>≦</u> 6
Standard E	Backlash P2	arcmin	2	15-100	<u>≡</u> 5 ≦12	<u>≡</u> 5 ≤10	<u>=</u> 7 ≦9	<u>=</u> 0 ≦8
		N·m						
	al Rigidity	/arcmin	1,2	3-100	1.5	4.0	8.5	17
Max. Radi	al Load F _{2rB} 1	N	1,2	3-100	760	1250	2030	4200
	I Load F _{2aB} ¹	N	1,2	3-100	410	700	1200	2600
	ng Temp.	°℃	1,2	3-100	-10°C ~ +90°C			
Servi	ce Life	hr	1,2	3-100	20,000 (10,000 Continuous operation)			ition)
Effic	iency	%	1	3-100	≧95%			
		,,,	2	15-100		≥90	0%	
We	eight	kg	1	3-10	0.9	1.9	4.8	11.5
		9	2	15-100	1.1	2.4	6.5	13.5
Mountin	g Position	-	1,2	3-100			rection	
Noise	Level ²	dBA/1m	1,2	3-100	61	63	66	67
Protect	ion Class	-	1,2	3-100			onal : IP67)	
Lubri	cation	-	1,2	3-100		Synthetic (Optional: Foo	Lubricant d Grade Grease)
					Inertia (J1)	, , , , , , , , , , , , , , , , , , , ,		,
Stage	Rat	io		unit	SGE-42(ψ8)	SGE-60(ψ14)	SGE-90(ψ19)	SGE-115(ψ24)
	3				0.04	0.23	0.77	2.30
	4				0.03	0.21	0.67	1.92
1	5				0.03	0.21	0.61	1.71
	7			2	0.03	0.21	0.60	1.65
9/10		0	K	g · cm²	0.03	0.21	0.60	1.63
Stage	Rat				SGE-42(ψ8)	SGE-60(ψ14)	SGE-90(ψ19)	SGE-115(ψ19)
	15/20				0.03	0.21	0.61	0.61
2	35/4				0.03	0.21	0.60	0.60
45/63/83		T\T00			0.03	0.21	0.60	0.60

^{* 1.} Applied to the output shaft center at 100 rpm.

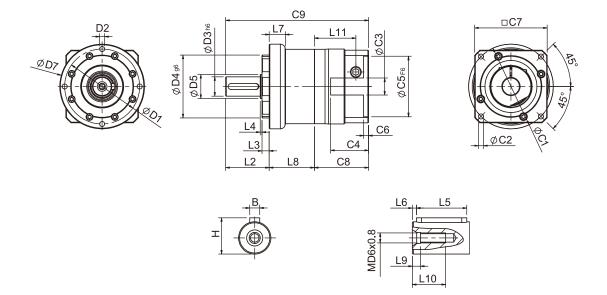
Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.



^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or

^{**}The above figures/specifications are subject to change without prior notice.

SGC Single Stage Dimensions



Specifications Unit:mm

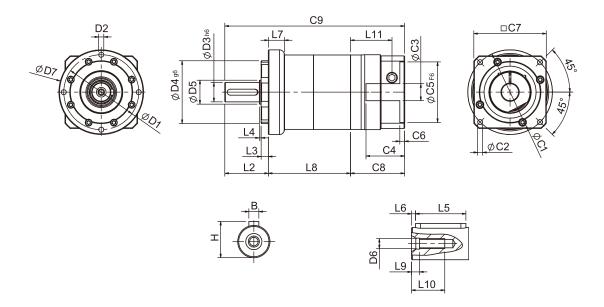
·		444	
Dimensions	SGC-50	SGC-70	SGC-90
D1	-	62	80
D2	-	M5x0.8P	M6x1.0P
D3h6	-	16	22
D4g6	-	52	68
D5	-	20	35
D6	-	M5x0.8P	M8x1.25P
D7	-	70	90
L2	-	36	46
L3	-	6	7
L4	-	1.5	2.5
L5	-	25	32
L6	-	2	3
L7	-	13.4	14.1
L8	-	37.3	43.8
L9	-	4	4.5
L10	-	16.5	20.5
L11	-	34.3	41.5
C1 ²	-	70	90
C2 ²	-	M5x0.8P	M6x1.0P
C3 ²	-	<u>≤</u> 14/ <u>≤</u> 19	≦19/≦24/≦28
C4 ²	-	33.5	41
C5 ² _{F6}	-	50	70
C6 ²	-	4	6
C7 ²	-	60	90
C8 ²	-	44.8	55.8
C9 ²	-	118.1	145.6
В	-	5	6
Н	-	18	24.5

 $[\]star$ C1~C9 are motor specific dimensions (metric std shown). Size may vary according to motor flange.



 $[\]bigstar$ Specification subject to change without notice.

SGC Double Stage Dimensions



Specifications Unit:mm

Dimensions	SGC-50	SGC-70	SGC-90
D1	-	62	80
D2	-	M5x0.8P	M6x1.0P
D3h6	-	16	22
D4g6	-	52	68
D5	-	20	35
D6	-	M5x0.8P	M8x1.25P
D7	-	70	90
L2	-	36	46
L3	-	6	7
L4	-	1.5	2.5
L5	-	25	32
L6	-	2	3
L7	-	13.4	14.1
L8	-	67.9	84.7
L9	-	4	4.5
L10	-	16.5	20.5
L11	-	34.3	41.5
C1 ²	-	70	90
C2 ²	-	M5x0.8P	M6x1.0P
C3 ²	-	<u>≤</u> 14/ <u>≤</u> 19	<i>≦</i> 19/ <i>≦</i> 24/ <i>≦</i> 28
C4 ²	-	33.5	41
C5 ² _{F6}	-	50	70
C6 ²	-	4	6
C7 ²	-	60	90
C8 ²	-	44.8	55.8
C9 ²	-	148.7	186.5
В	-	5	6
Н	-	18	24.5

 $[\]bigstar \ \text{C1}{\sim}\text{C9 are motor specific dimensions (metric std shown)}. \ \text{Size may vary according to motor flange}.$

 $[\]star$ Specification subject to change without notice.



SGC Specifications

	Specifications		Stage	Ratio	SGC-50	SGC-70	SGC-90	SGC-120
				3	9	28	85	220
				4	10	32	80	240
			1	5	11	35	95	270
			1	7	10	28	85	220
				9	8	23	75	210
				10	8	21	65	190
			Stage	Ratio	SGC-50	SGC-70	SGC-90	SGC-120
Nominal Out	tput Torque T _{2N}	N·m		15	11	34	90	250
				20	10	32	80	240
				25	11	35	95	270
				35	11	35	95	270
			2	45	11	35	95	270
				49	10	28	85	220
				63	10	28	85	220
				81	8	23	75	210
				100	8	21	65	190
Emergency St	op Torque T _{2NOT}	N·m		(*M	(3.0 t in ax. Output Torqı	nes of Nominal C ue T _{2B} =60% of E	Output Torque) mergency Stop	Torque)
Nominal Inp	out Speed n _{1N}	rpm	1,2	3-100	4000	4000	3000	2500
Max. Inpu	ut Speed n _{1max}	rpm	1,2	3-100	6000	6000	6000	5000
Ctandard	l Backlash P2	arcmin	1	3-10	<u>≤</u> 9	≦8	<u>≤</u> 7	<u>≦</u> 6
Standard	I Dackiasii PZ		2	15-100	≦12	<u>≦</u> 10	<u>≦</u> 9	≦8
Torsion	nal Rigidity	N·m /arcmin	1,2	3-100	1.5	4.0	8.5	17
Max. Rac	dial Load F _{2rB} ¹	N	1,2	3-100	760	1250	2030	4200
	ial Load F _{2aB} 1	N	1,2	3-100	410	700	1200	2600
·	ting Temp.	°℃	1,2	3-100	-10°C ~ +90°C			
Serv	vice Life	hr	1,2	3-100	20,000 (10,000 Continuous Operation)			
Effi	ciency	%	1	3-100	≥95%			
	ciericy	/0	2	15-100	≥90%			
W	eight	kg	1	3-10	0.9	1.9	4.8	11.5
		K9	2	15-100	1.1	2.4	6.5	13.5
Mounti	ing Position	-	1,2	3-100		Any Dii	ection	
Nois	e Level ²	dBA/1m	1,2	3-100	61	63	66	67
Protec	tion Class	-	1,2	3-100		IP65 (Option	onal : IP67)	
Lubr	rication	-	1,2	3-100		Synthetic (Optional: Foo	Lubricant d Grade Grease)
					Inertia (J1)			
Stage	Rat			unit	SGC-50(ψ8)	SGC-70(ψ14)	SGC-90(ψ19)	SGC-120(ψ24)
	3				0.04	0.23	0.77	2.30
	4				0.03	0.21	0.67	1.92
1	5		_		0.03	0.21	0.61	1.71
	7		┨	2	0.03 0.03	0.21 0.21	0.60 0.60	1.65 1.63
9/10		$ \mid$ \mid K	g · cm²					
Stage	Rat				SGC-50(ψ8)	SGC-70(ψ14)	SGC-90(ψ19)	SGC-120(ψ19)
2	15/20 35/4		_		0.03	0.21 0.21	0.61	0.61
	45/63/8				0.03	0.21	0.60	0.60 0.60
	1 -13/03/0	/			1 0.03	0.21	0.00	0.00

 $[\]star$ 1. Applied to the output shaft center at 100 rpm.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.



^{* 2.} Environment noise level 30 dB; distance 1m; measured under free loading with input speed 3000 rpm; ratio = 10 (1-stage) or ratio = 100 (2-stage).

XThe above figures/specifications are subject to change without prior notice.