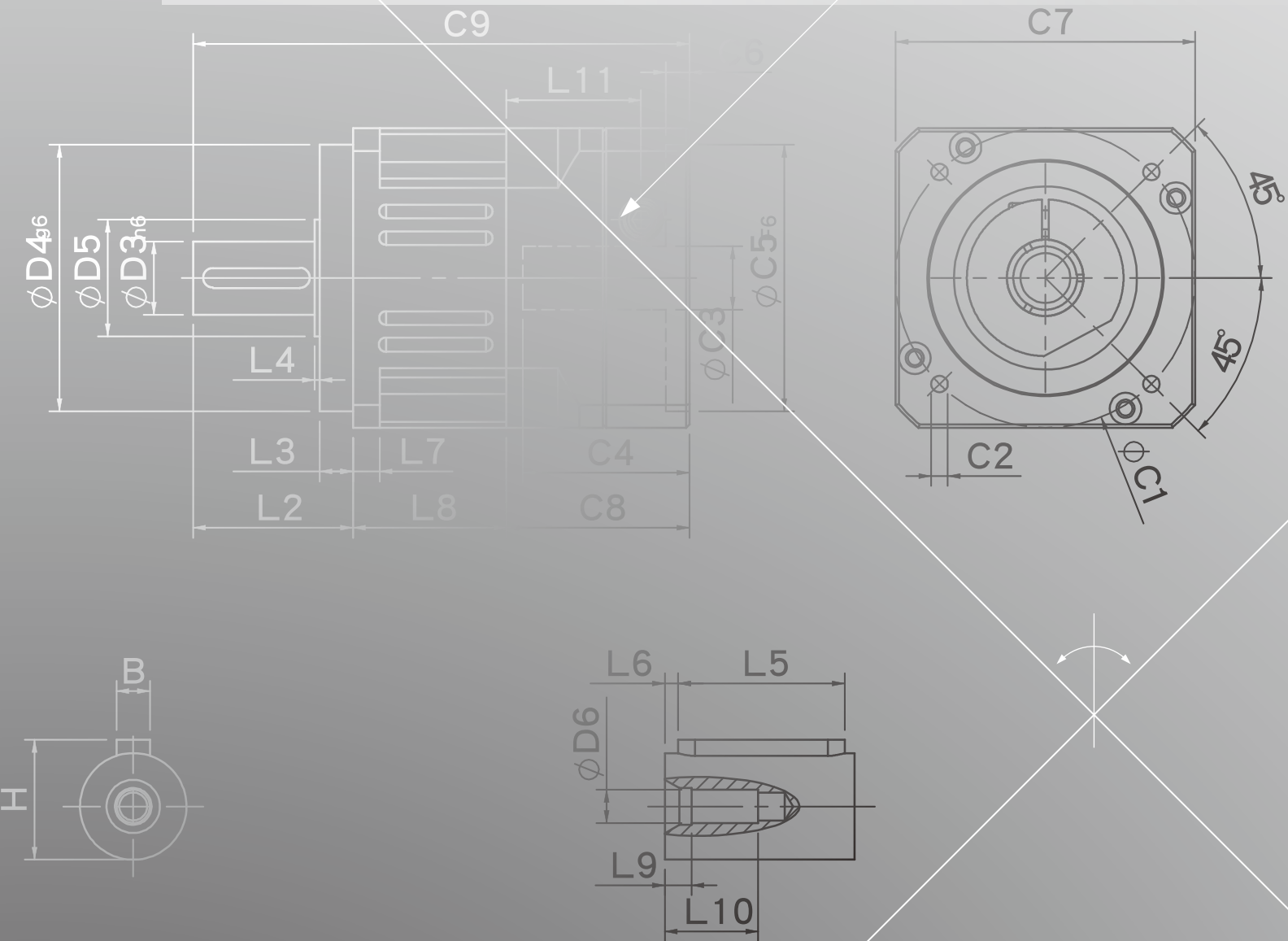
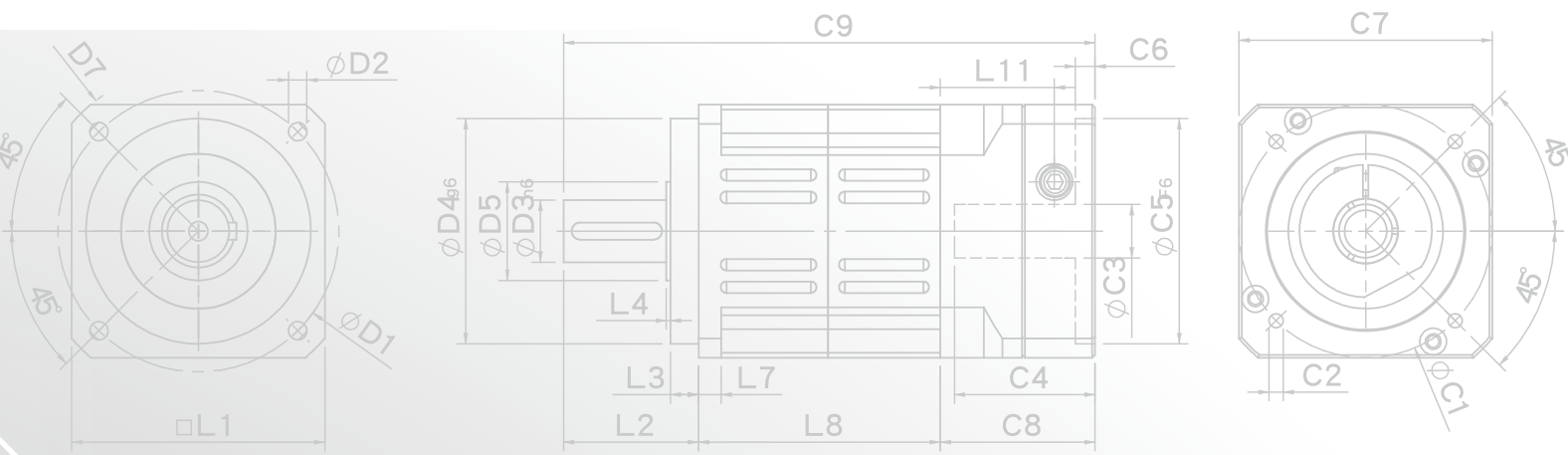
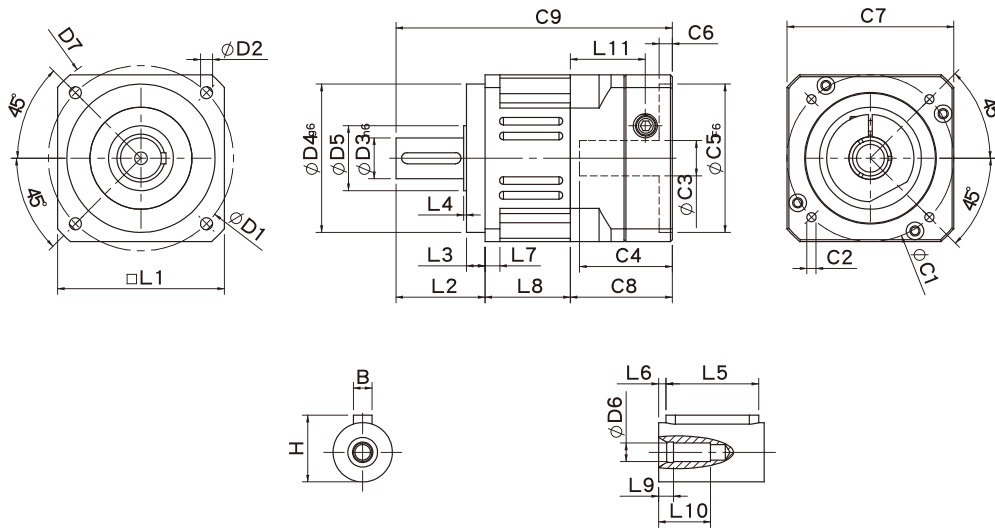


# PHL SERIES





## PHL Single Stage Dimensions



## Specifications

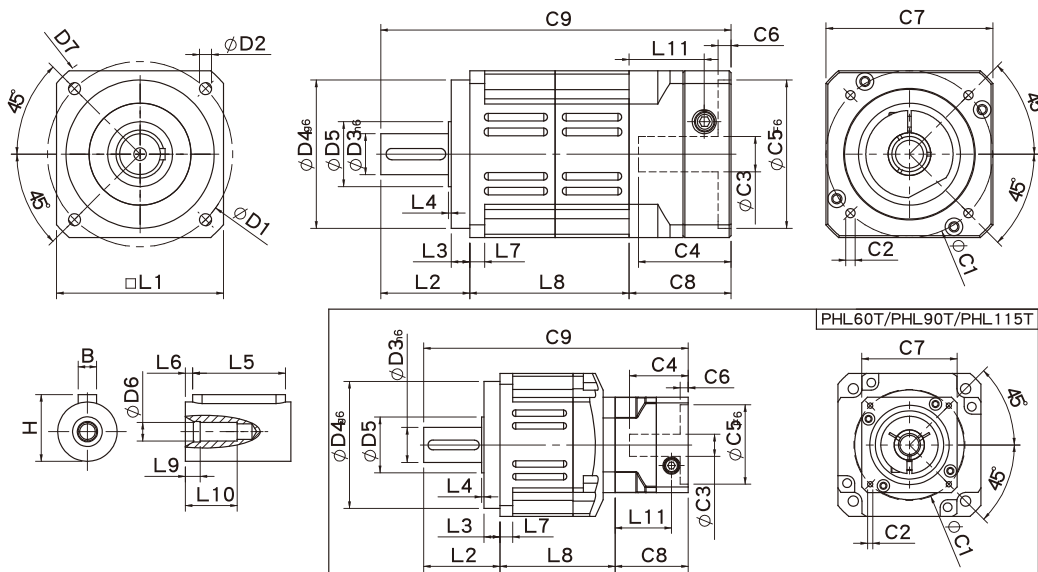
Unit:mm

Dimensions	PHL42	PHL60	PHL90
D1	50	70	100
D2	3.4	5.5	6.5
D3 <sub>h6</sub>	13	16	22
D4 <sub>g6</sub>	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 <sup>2</sup>	46	70	90
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M6x1.0P
C3 <sup>2</sup>	≤8/≤11	≤14	≤19/≤24
C4 <sup>2</sup>	27	37	47
C5 <sup>2</sup> <sub>F6</sub>	30	50	70
C6 <sup>2</sup>	4	4	6
C7 <sup>2</sup>	42.6	60	90
C8 <sup>2</sup>	38.5	46	55
C9 <sup>2</sup>	92.8	120	149
B	5	5	6
H	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.

## PHL Double Stage Dimensions



## Specifications

Unit:mm

Dimensions	PHL42	PHL60	PHL60T	PHL90	PHL90T
D1	50		70		100
D2	3.4		5.5		6.5
D3 <sup>h6</sup>	13		16		22
D4 <sup>g6</sup>	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	1.5		1.5		1.5
L5	15		25		32
L6	2		2		3
L7	4		6		8
L8	55.3	70	65.5	86	78.5
L9	4		4		4.5
L10	14		16.5		20.5
L11	29	35.5	29	40.5	35.5
C1 <sup>2</sup>	46	70	46	90	70
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M5x0.8P	M6x1.0P	M5x0.8P
C3 <sup>2</sup>	≤8/≤11	≤14	≤8/≤11	≤19/≤24	≤14
C4 <sup>2</sup>	27	37	27	47	37
C5 <sup>2 F6</sup>	30	50	30	70	50
C6 <sup>2</sup>	4	4	4	6	4
C7 <sup>2</sup>	42.6	60	42.6	90	60
C8 <sup>2</sup>	38.5	46	38.5	55	46
C9 <sup>2</sup>	119.8	153	141	189	172.5
B	5		5		6
H	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.

## PHL Specifications Table

Specifications		Stage	Ratio	PHL-42	PHL-60	PHL-90
Nominal Output Torque $T_{2N}$	N • m	1	3	19	53	145
			4	20	55	150
			5	17	54	140
			6	15	46	135
			7	14	44	125
			8	12	41	110
			9	11	37	95.0
		10	11	37	95.0	
		Stage	Ratio	PHL-42	PHL-60(T)	PHL-90(T)
		2	15	19	53	145
			20	20	55	150
			25	17	54	140
			30	17	54	140
			35	17	54	140
			40	17	54	140
			45	17	54	140
			50	17	54	140
			60	15	46	135
			70	14	44	125
80	12		41	110		
90	11		37	95		
100	11	37	95			
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 $n_{1N}$	rpm	1,2	3-100	5000	5000	4000
Max. Input Speed $n_{1max}$	rpm	1,2	3-100	10000	10000	8000
Micro Backlash P0	arcmin	1	3-10	≤ 1	≤ 1	≤ 1
		2	15-100	≤ 3	≤ 3	≤ 3
Precision Backlash P1	arcmin	1	3-10	≤ 3	≤ 3	≤ 3
		2	15-100	≤ 5	≤ 5	≤ 5
Standard Backlash P2	arcmin	1	3-10	≤ 5	≤ 5	≤ 5
		2	15-100	≤ 7	≤ 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	-10 °C ~ +90 °C				
Service Life	hr	20,000 (10,000/ Continuous operation)				
Efficiency	%	1	3-10	≥ 97%		
		2	15-100	≥ 94%		
Weight	kg	1	3-10	0.6	1.3	3.5
		2	15-100	0.9	2.0/1.6	5.6/3.9
Mounting Position	-	1,2	3-100	Any direction		
Noise Level <sup>2</sup>	dB(A)/1m	1,2	3-100	56	58	60
Protection Class	-	1,2	3-100	IP65		
Lubrication	-	1,2	3-100	Synthetic Lubricant		
Inertia(J1)						
Stage	Ratio	unit		PHL-42	PHL-60	PHL-90
1	3	Kg • cm <sup>2</sup>		0.03	0.23	0.97
	4			0.02	0.18	0.67
	5			0.02	0.17	0.65
	6/7/8			0.02	0.14	0.60
	9/10			0.02	0.14	0.58
Stage	Ratio			PHL-42	PHL-60(T)	PHL-90(T)
2	15/20/25			0.02	0.17(0.02)	0.65(0.17)
	30/35/40			0.02	0.14(0.02)	0.60(0.14)
	45/50/60/70/80/90/100			0.02	0.14(0.02)	0.58(0.14)

\* 1. Applied to the output shaft center @100rpm.

\* 2. Measured at 3000rpm 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.

# SERVO MOTOR GEARHEADS



PHL

PHFR

PHF

PGH

PUR

PUL

PGLH

PGL

PGC

PGE

PGRH

PCR

PGFR

PGF

PBC

PBE

PAE

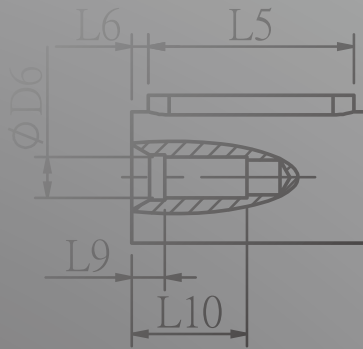
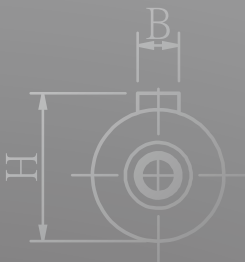
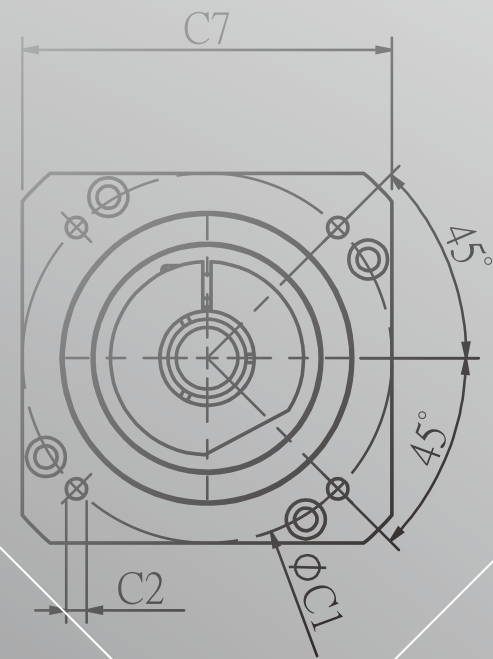
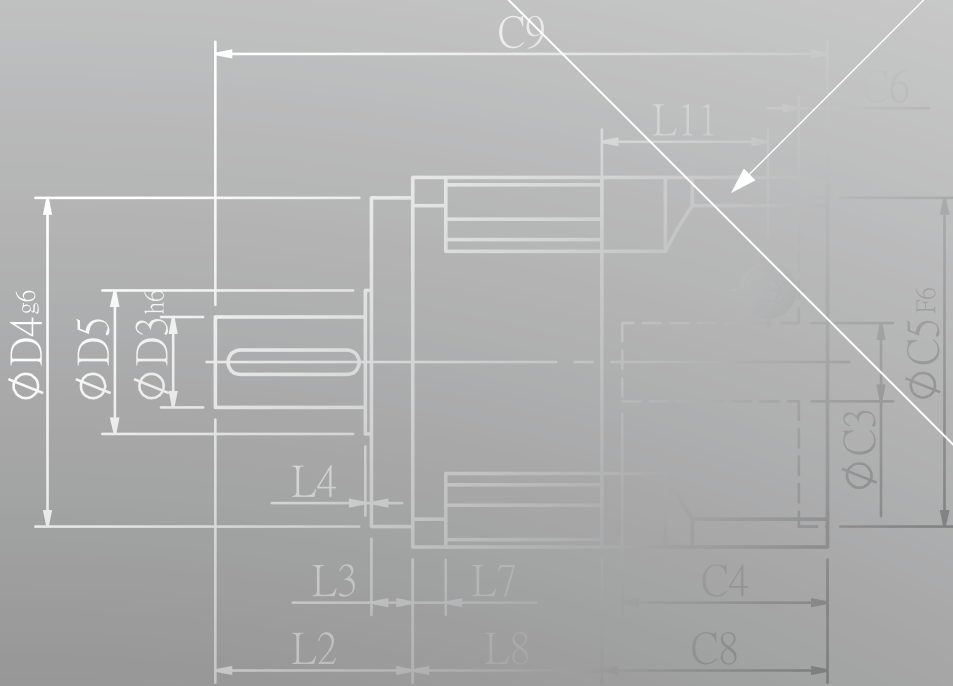
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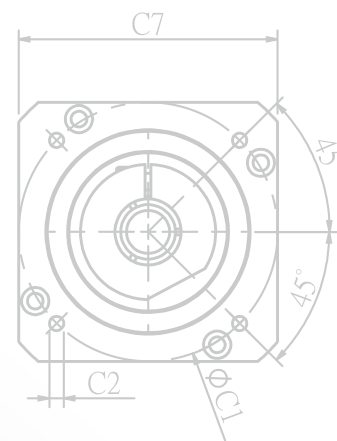
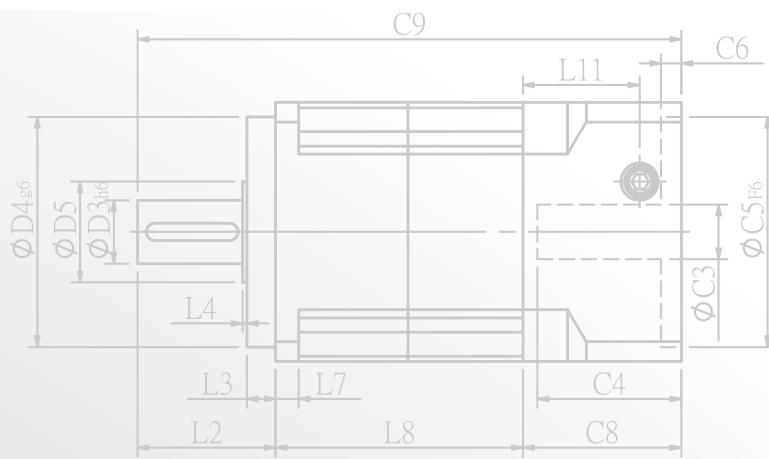
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PGS

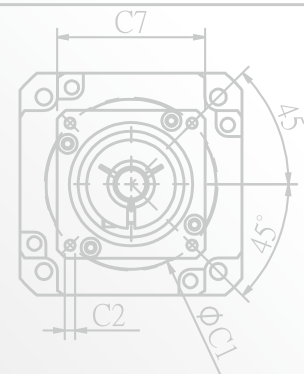
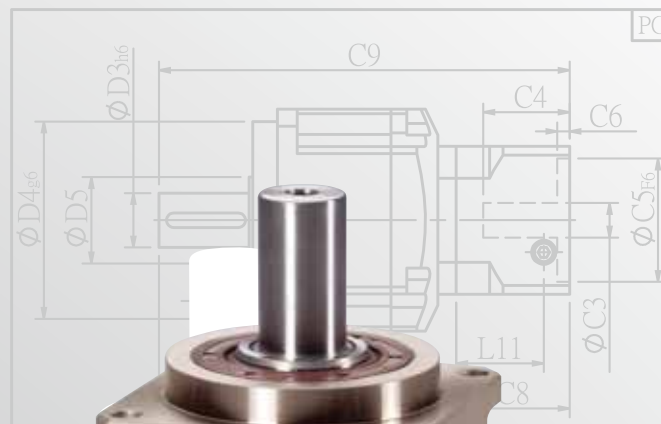
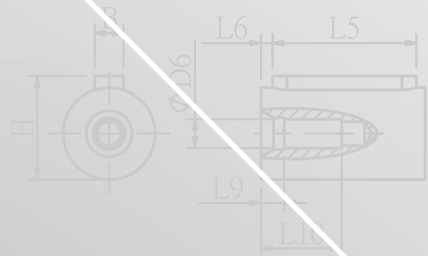
PNS

# PGH SERIES



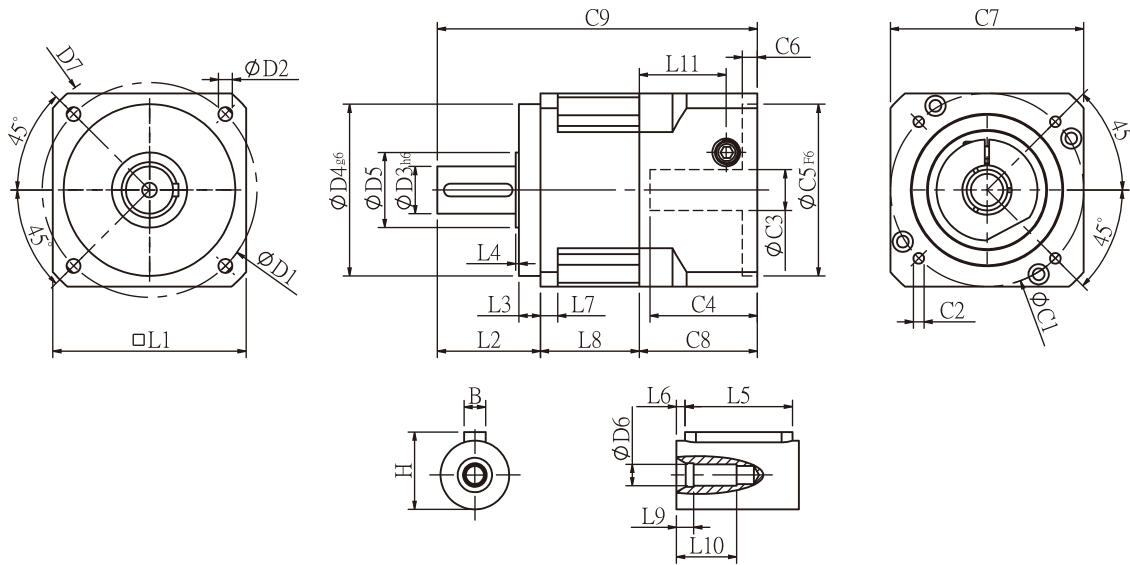


PGH60T/PGH90T/PGH115T/PGH142T/PGH180T





## PGH Single Stage Dimensions



## Specifications

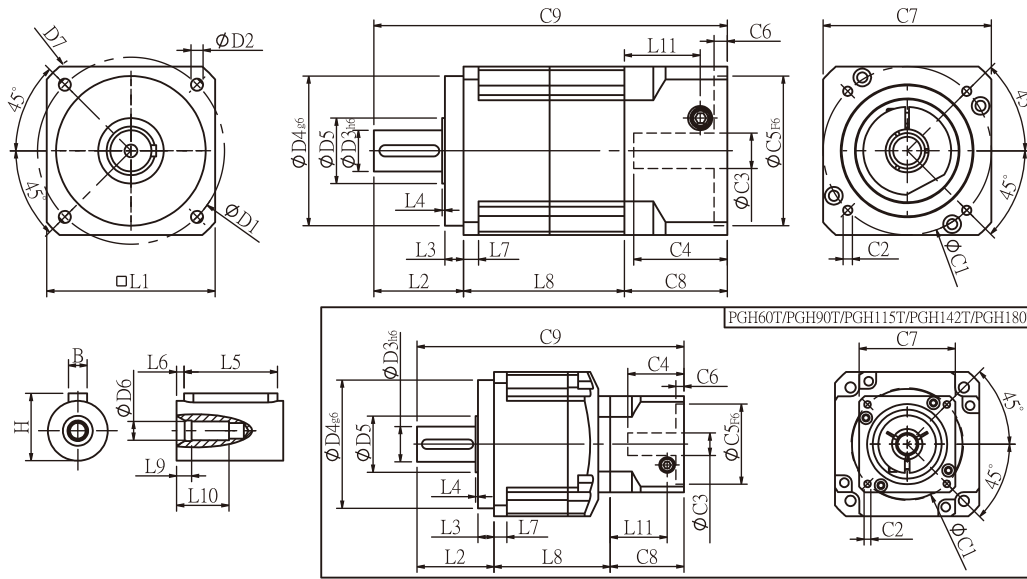
Unit:mm

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
D3 h6	13	16	22	32	40	55	75
D4 g6	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 <sup>2</sup>	46	70	90	115	145	200	235
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P	M12x1.75P
C3 <sup>2</sup>	≤8/≤11	≤14/≤19	≤19/≤24	≤24/≤32/≤38	≤35/≤38	≤50	≤55
C4 <sup>2</sup>	27	37	47	56	66.5	82	112
C5 <sup>2</sup> F6	30	50	70	95	110	114.3	200
C6 <sup>2</sup>	4	4	6	10	6	13	6
C7 <sup>2</sup>	42.6	60	90	115	140	180	220
C8 <sup>2</sup>	38.5	46	55	63	80	95	120
C9 <sup>2</sup>	92.8	120	149	183	247	289.5	369
B	5	5	6	10	12	16	20
H	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.

★ Specification subject to change without notice.

## PGH Double Stage Dimensions



## Specifications

Unit:mm

Dimensions	PGH42	PGH60	PGH60T	PGH90	PGH90T	PGH115T	PGH142T	PGH180T	PGH220T
D1	50	70		100		130	165	215	250
D2	3.4	5.5		6.5		8.5	10.5	13	17
D3 h6	13	16		22		32	40	55	75
D4 g6	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	M20x1.5P
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	55.3	70	65.5	86	78.5	99.5	127.5	166	202
L9	4	4		4.5		6	6	8	15
L10	14	16.5		20.5		30	38	48	42
L11	29	35.5	29	40.5	35.5	40.5	42	63	74
C1 <sup>2</sup>	46	70	46	90	70	90	115	145	200
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 <sup>2</sup>	≤8/≤11	≤14/≤19	≤8/≤11	≤19/≤24	≤14	≤19/≤24	≤24/≤32/≤38	≤35/≤38	≤50
C4 <sup>2</sup>	27	37	27	47	37	47	56	66.5	81
C5 <sup>2</sup> F6	30	50	30	70	50	70	95	110	114.3
C6 <sup>2</sup>	4	4	4	6	4	6	10	6	6
C7 <sup>2</sup>	42.6	60	42.6	90	60	90	115	140	180
C8 <sup>2</sup>	38.5	46	38.5	55	46	55	63	80	93
C9 <sup>2</sup>	119.8	153	141	189	172.5	217.5	282	346.5	433
B	5	5		6		10	12	16	20
H	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.

★ Specification subject to change without notice.

## PGH Specifications Table

Specifications		Stage	Ratio	PGH-42	PGH-60	PGH-90	PGH-115	PGH-142	PGH-180	PGH-220	
Nominal Output Torque $T_{2N}$	N • m	1	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	
			7	14	44	125	270	450	960	1750	
			8	12	41	110	240	390	900	1550	
			9	11	37	95	220	360	800	1500	
			10	11	37	95	220	360	800	1450	
			Stage	Ratio	PGH-42	PGH-60 (T)	PGH-90(T)	PGH-115T	PGH-142T	PGH-180T	PGH-220T
			15	19	53	145	290	520	950	2000	
		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		
		45	17	54	140	290	530	1050	2000		
		50	17	54	140	290	530	1050	2000		
		60	15	46	135	280	490	1000	1850		
		70	14	44	125	270	450	960	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				
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 $n_{1N}$	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	6000	4000	
Micro Backlash P0	arcmin	1	3-10	≤ 2	≤ 2	≤ 2	≤ 1	≤ 1	≤ 1	≤ 1	
		2	15-100	≤ 4	≤ 4	≤ 4	≤ 3	≤ 3	≤ 3	≤ 3	
Precision Backlash P1	arcmin	1	3-10	≤ 4	≤ 4	≤ 4	≤ 3	≤ 3	≤ 3	≤ 3	
		2	15-100	≤ 6	≤ 6	≤ 6	≤ 5	≤ 5	≤ 5	≤ 5	
Standard Backlash P2	arcmin	1	3-10	≤ 6	≤ 6	≤ 6	≤ 5	≤ 5	≤ 5	≤ 5	
		2	15-100	≤ 8	≤ 8	≤ 8	≤ 7	≤ 7	≤ 7	≤ 7	
Torsional Rigidity	N • m /arcmin	1,2	3-100	2.5	6	12	23	45	75	130	
Max. Radial Load $F_{2rB}^1$	N	1,2	3-100	760	1570	2780	5340	8400	13000	13810	
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	3-10	≥ 97%							
		2	15-100	≥ 94%							
Weight	kg	1	3-10	0.6	1.3	3.5	7.8	16.1	27	55	
		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	Any direction							
Noise Level <sup>2</sup>	dBA/1m	1,2	3-100	56	58	60	63	65	67	70	
Protection Class	-	1,2	3-100	IP65							
Lubrication	-	1,2	3-100	Synthetic Lubricant							
Inertia(J1)											
Stage	Ratio	unit		PGH-42	PGH-60	PGH-90	PGH-115	PGH-142	PGH-180	PGH-220	
1	3	Kg • cm <sup>2</sup>		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	
	5			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			0.02	0.14	0.58	1.41	6.10	22.73	53.98	
Stage	Ratio			PGH-42	PGH-60(T)	PGH-90(T)	PGH-115T	PGH-142T	PGH-180T	PGH-220T	
2	15/20/25			0.02	0.17(0.02)	0.65(0.17)	0.65	1.50	6.52	23.63	
	30/35/40			0.02	0.14(0.02)	0.60(0.14)	0.60	1.45	6.17	22.92	
	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	

\* 1. Applied to the output shaft center @100rpm.

\* 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.

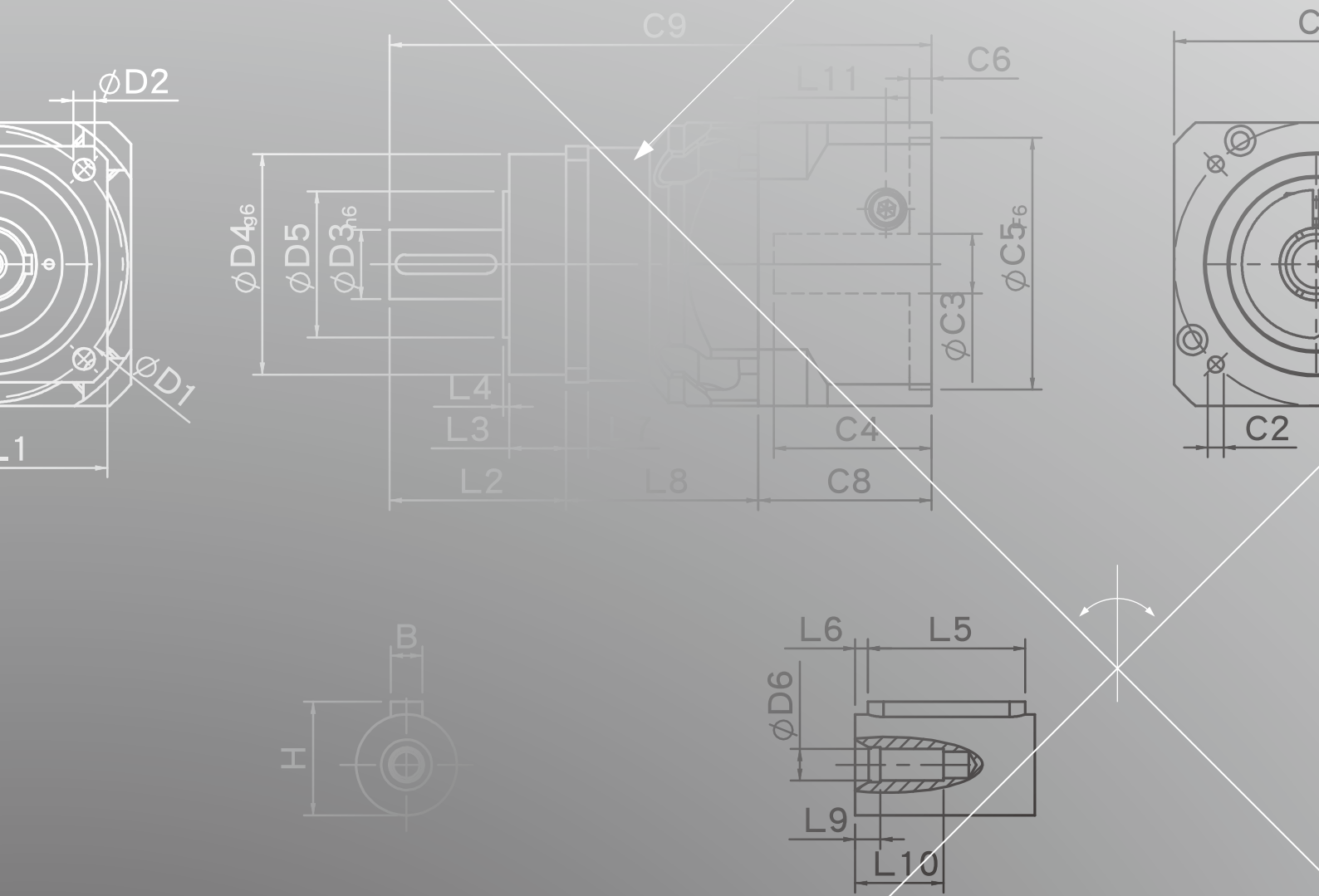
Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

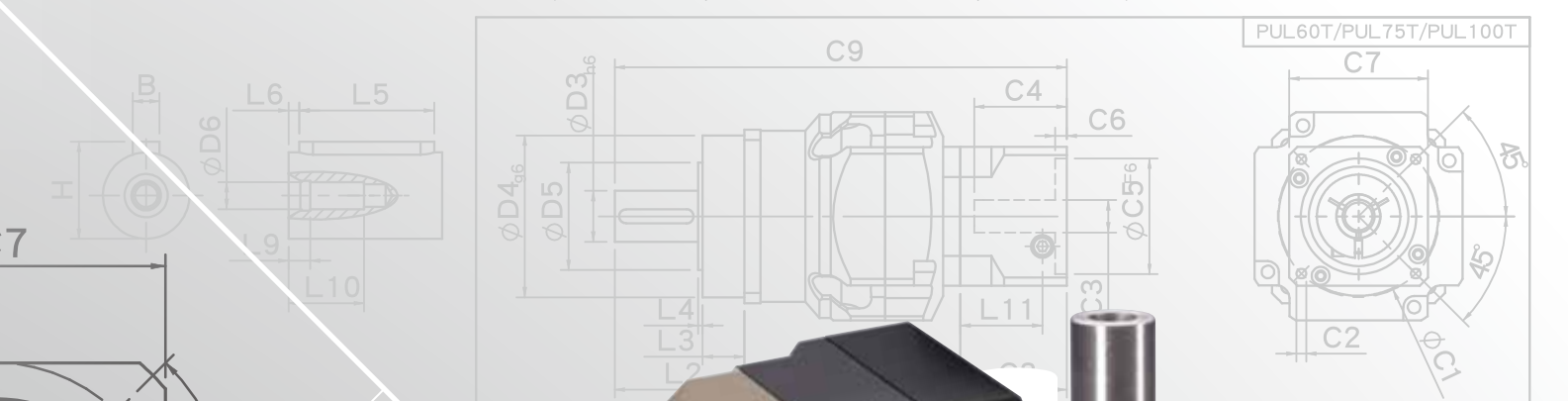
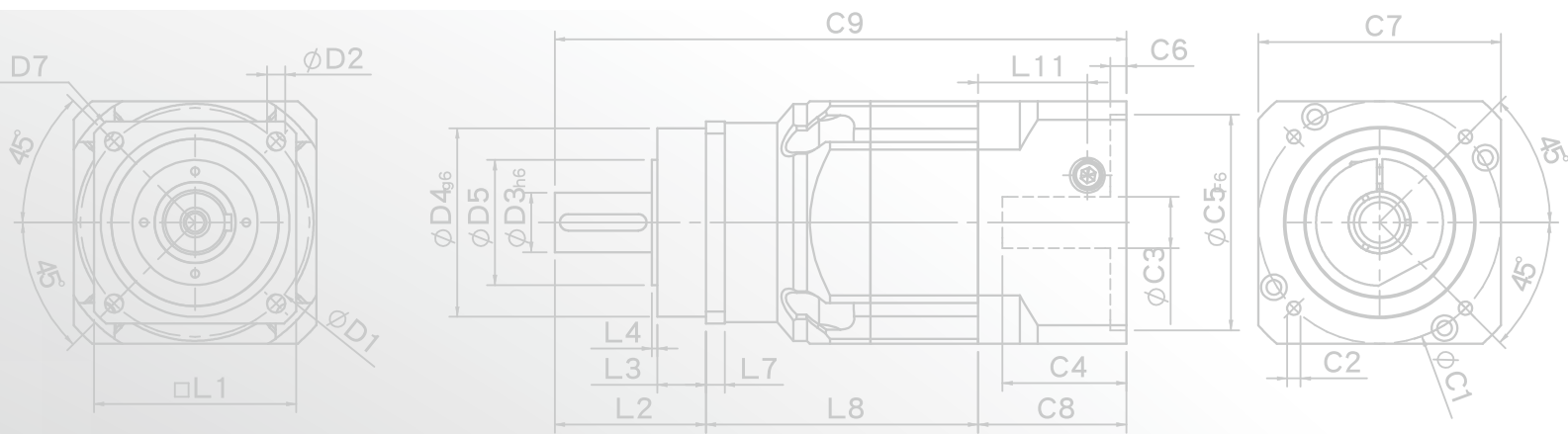
# SERVO MOTOR GEARHEADS



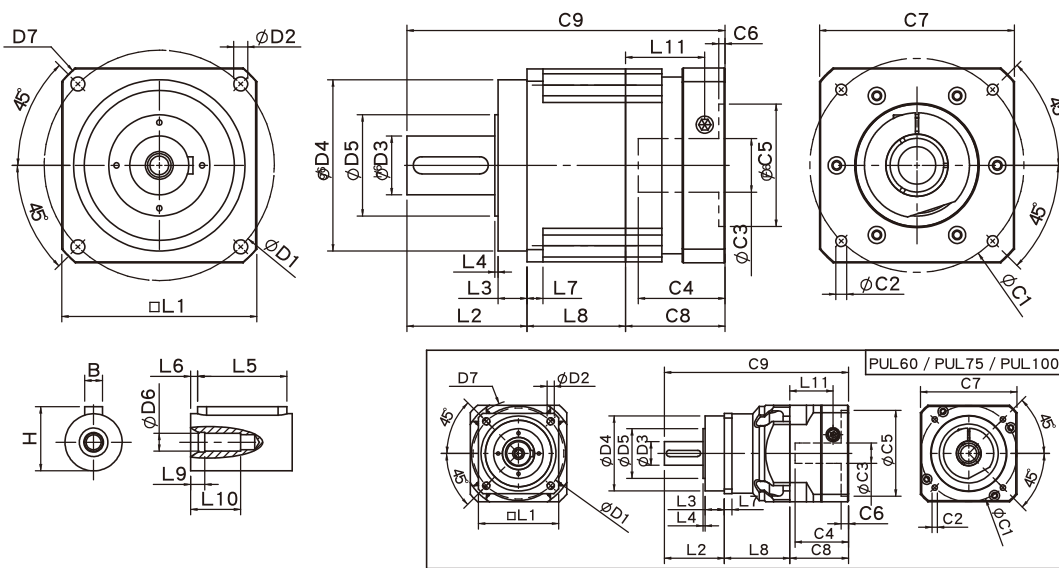
- PHL
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- PHF
- PGH**
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- PUL
- PGLH
- PGL
- PGC
- PGE
- PGRH
- PCR
- PGFR
- PGF
- PBC
- PBE
- PAE
- PAC
- PAN
- PGS
- PNS

# ***PUL*** SERIES





## PUL Single Stage Dimensions



## Specifications

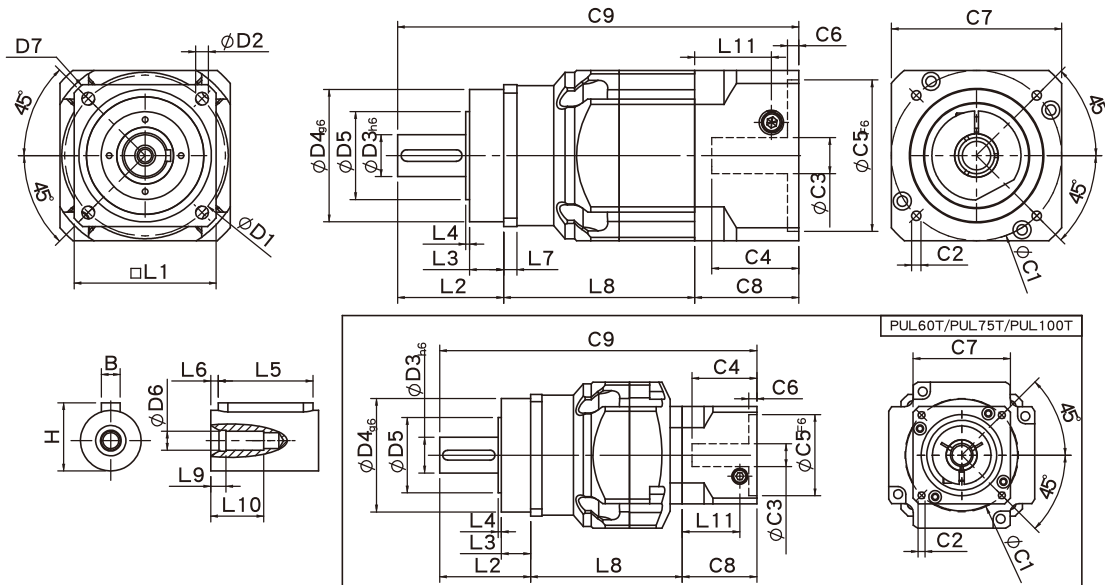
Unit:mm

Dimensions	PUL60	PUL75	PUL100	PUL140	PUL180	PUL220
D1	68	85	120	165	215	250
D2	5.5	6.8	9	11	13	17
D3 <sub>h6</sub>	16	22	32	40	55	75
D4 <sub>g6</sub>	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 <sup>2</sup>	70	90	115	165	200	235
C2 <sup>2</sup>	M5x0.8P	M6x1P	M8x1.25P	M10x1.5P	M12x1.75P	M12x1.75P
C3 <sup>2</sup>	≤14/≤19	≤19/≤24	≤24/≤32/≤38	≤35/≤38	≤50	≤55
C4 <sup>2</sup>	37	47	51	66.7	81	112
C5 <sup>2</sup> <sub>F6</sub>	50	70	95	130	114.3	200
C6 <sup>2</sup>	4	6	6	5.5	6	6
C7 <sup>2</sup>	60	90	115	140	182	220
C8 <sup>2</sup>	46	55	58	87.2	93	120
C9 <sup>2</sup>	138.5	172	192	263.7	297	369
B	5	6	10	12	16	20
H	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.

★ Specification subject to change without notice.

## PUL Double Stage Dimensions-1



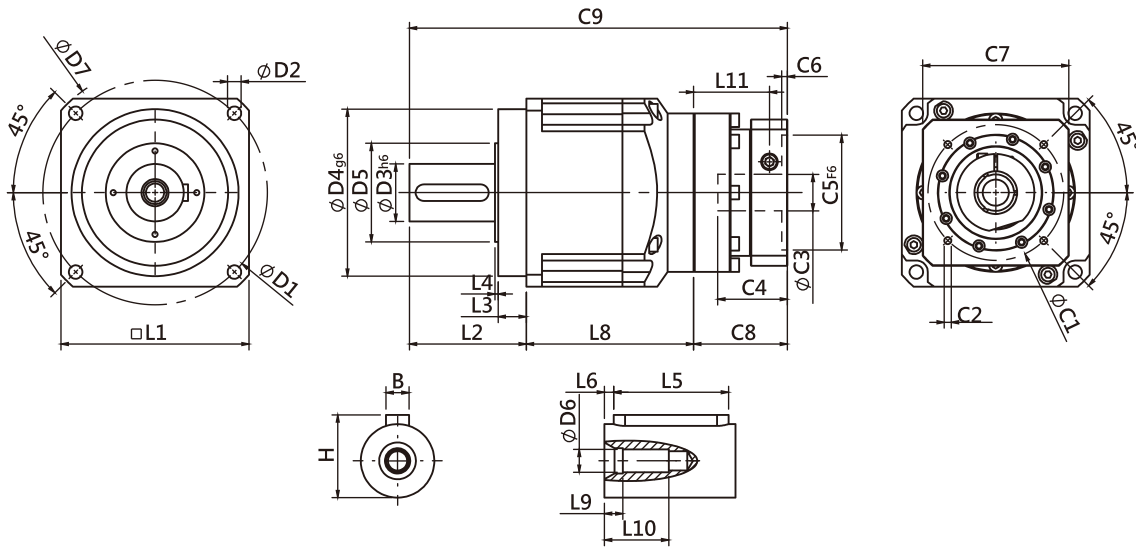
## Specifications Unit:mm

Dimensions	PUL60/PUL60T		PUL75/PUL75T		PUL100T
D1	68		85		120
D2	5.5		6.8		9
D3 <sub>h6</sub>	16		22		32
D4 <sub>g6</sub>	60		70		90
D5	34.6		46.4		59.6
D6	M5x0.8P		M8x1.25P		M12x1.75P
D7	80		100		138
L1	62		76		105
L2	48.5		56		88
L3	18.5		18		28
L4	1.5		2		2
L5	25		32		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 <sup>2</sup>	70	46	90	70	90
C2 <sup>2</sup>	M5x0.8P	M4x0.7P	M6x1P	M5x0.8P	M6x1P
C3 <sup>2</sup>	≤14/≤19	≤8/≤11	≤19/≤24	≤14/≤19	≤19/≤24
C4 <sup>2</sup>	37	27	47	37	47
C5 <sup>2</sup> <sub>F6</sub>	50	30	70	50	70
C6 <sup>2</sup>	4	4	6	4	6
C7 <sup>2</sup>	60	42.6	90	60	90
C8 <sup>2</sup>	46	38.5	55	46	55
C9 <sup>2</sup>	171.5	159.5	212	195.5	231.5
B	5		6		10
H	18		24.5		35

★ C1~C9 are motor specific dimensions(metric std shown ), Size may vary according to the motor flange chosen.  
 ★ 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
D3 <sub>h6</sub>	40	55	75
D4 <sub>g6</sub>	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 <sup>2</sup>	130	130	200
C2 <sup>2</sup>	M8x1.25P	M8x1.25P	M12x1.75P
C3 <sup>2</sup>	$\leq 24 / \leq 32 / \leq 38$	$\leq 35 / \leq 38$	$\leq 50$
C4 <sup>2</sup>	51	66.7	81
C5 <sup>2</sup> <sub>F6</sub>	110	110	114.3
C6 <sup>2</sup>	6	5.5	6
C7 <sup>2</sup>	115	140	180
C8 <sup>2</sup>	58	89.8	93
C9 <sup>2</sup>	290	362	433
B	12	16	20
H	43	59	79.5

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

★ Specification subject to change without notice.

## PUL Specifications Table

Specifications		Stage	Ratio	PUL-60	PUL-75	PUL-100	PUL-140	PUL-180	PUL-220	
Nominal Output Torque $T_{2N}$	N • m	1	3	53	145	180	310	580	1100	
			4	55	150	240	450	1100	1700	
			5	54	140	290	530	1200	2000	
			6	46	135	280	490	1100	1850	
			7	44	125	270	450	1100	1750	
			8	41	110	240	390	1000	1550	
			9	37	95	220	360	900	1500	
			10	37	95	220	360	900	1450	
			Stage	Ratio	PUL-60 (T)	PUL-75(T)	PUL-100T	PUL-140T	PUL-180T	PUL-220T
			15	53	145	180	530	1200	2000	
		20	55	150	240	530	1200	2000		
		25	54	140	290	530	1200	2000		
		30	54	140	290	530	1200	2000		
		35	54	140	290	530	1200	2000		
		40	54	140	290	530	1200	2000		
		45	54	140	290	530	1200	2000		
		50	54	140	290	530	1200	2000		
		60	46	135	280	490	1200	1850		
		70	44	125	270	450	1100	1750		
		80	41	110	240	390	1000	1550		
90	37	95	220	360	900	1500				
100	37	95	220	360	900	1450				
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 $n_{1N}$	rpm	1,2	3-100	5000	4000	4000	3000	3000	2000	
Max. Input Speed $n_{1max}$	rpm	1,2	3-100	10000	8000	8000	6000	6000	4000	
Micro Backlash P0	arcmin	1	3-10	≤ 2	≤ 2	≤ 1	≤ 1	≤ 1	≤ 1	
		2	12-100	≤ 4	≤ 4	≤ 3	≤ 3	≤ 3	≤ 3	
Precision Backlash P1	arcmin	1	3-10	≤ 4	≤ 4	≤ 3	≤ 3	≤ 3	≤ 3	
		2	12-100	≤ 6	≤ 6	≤ 5	≤ 5	≤ 5	≤ 5	
Standard Backlash P2	arcmin	1	3-10	≤ 6	≤ 6	≤ 5	≤ 5	≤ 5	≤ 5	
		2	12-100	≤ 8	≤ 8	≤ 7	≤ 7	≤ 7	≤ 7	
Torsional Rigidity	N • m /arcmin	1,2	3-100	7	14	25	50	150	220	
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 Temp.	°C		3-100	-10 °C ~ +90 °C						
Service Life	hr		3-100	30,000 (15,000/ Continuous operation)						
Efficiency	%	1	3-10	≥ 97%						
		2	12-100	≥ 94%						
Weight	kg	1	3-10	1.8	4.0	6.7	15.1	30.8	55	
		2	12-100	2.4/2.0	5.7/4.5	8.2	17.5	37	68.5	
Mounting Position	-	1,2	3-100	Any direction						
Noise Level <sup>2</sup>	dBA/1m	1,2	3-100	58	60	63	65	67	70	
Protection Class	-	1,2	3-100	IP65						
Lubrication	-	1,2	3-100	Synthetic Lubricant						
Inertia(J1)										
Stage	Ratio	unit		PUL-60	PUL-75	PUL-100	PUL-140	PUL-180	PUL-220	
1	3	Kg • cm <sup>2</sup>		0.23	0.97	2.35	10.00	30.50	79.50	
	4			0.18	0.67	1.66	7.17	25.86	58.21	
	5			0.17	0.65	1.50	6.52	23.63	54.36	
	6/7/8			0.14	0.60	1.45	6.17	22.92	54.12	
	9/10			0.14	0.58	1.41	6.10	22.73	53.98	
Stage	Ratio			PUL-60(T)	PUL-75(T)	PUL-100T	PUL-140T	PUL-180T	PUL-220T	
2	15/20/25			0.17(0.02)	0.65(0.17)	0.65	1.50	6.52	23.63	
	25/30/35/40			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	

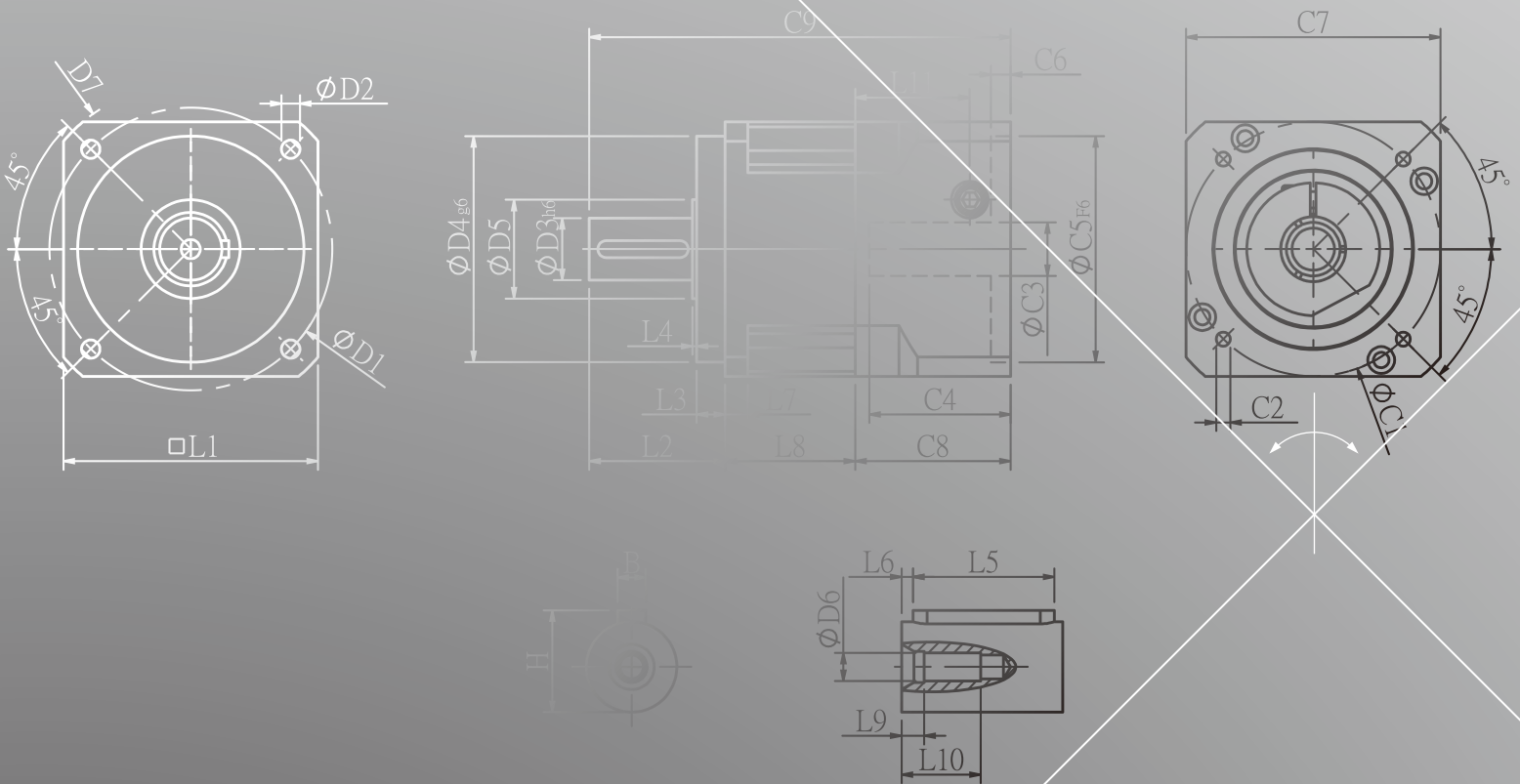
\* 1. Applied to the output shaft center @100rpm.

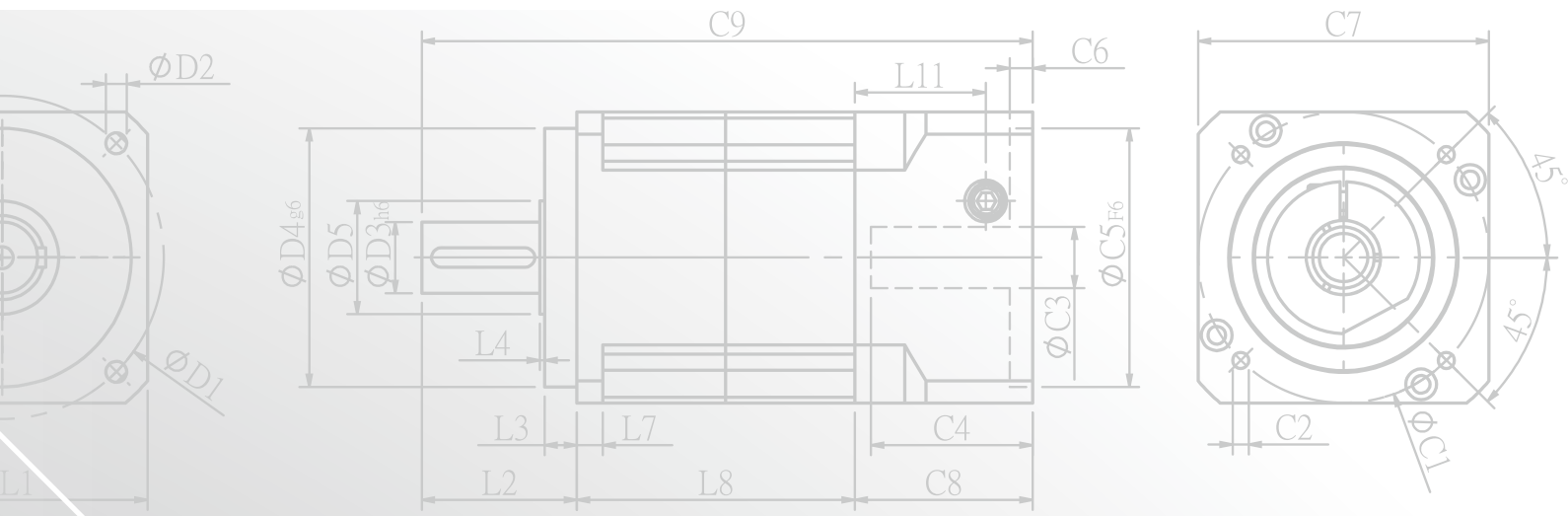
\* 2. Measured at 3000 rpm with no load. These values are measured by gearbox with ratio = 10 (1-stage) or ratio = 100 (2-stage) at nominal input speed or 3000 rpm (if nominal input speed is higher than 3000 rpm) with no load.

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

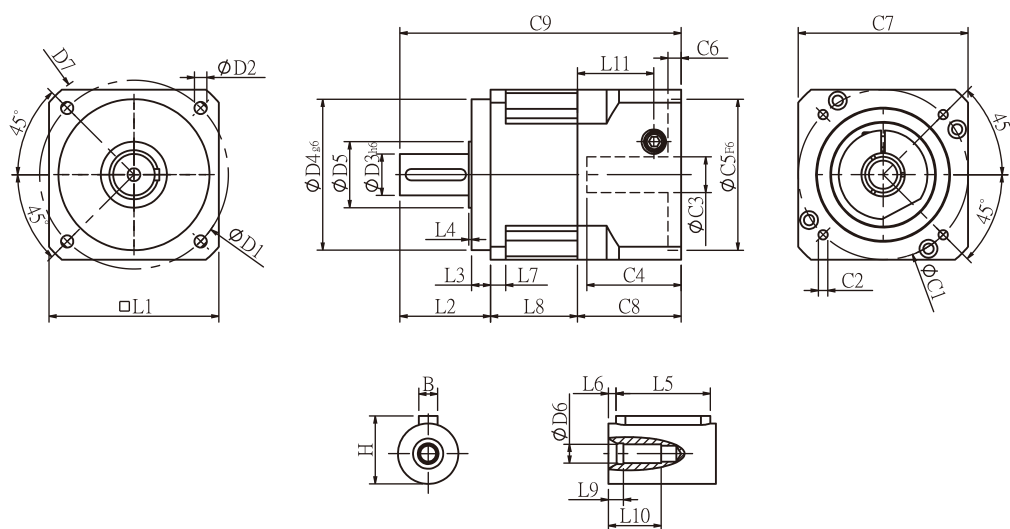
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# PGLH SERIES





## PGLH Single Stage Dimensions



## Specifications

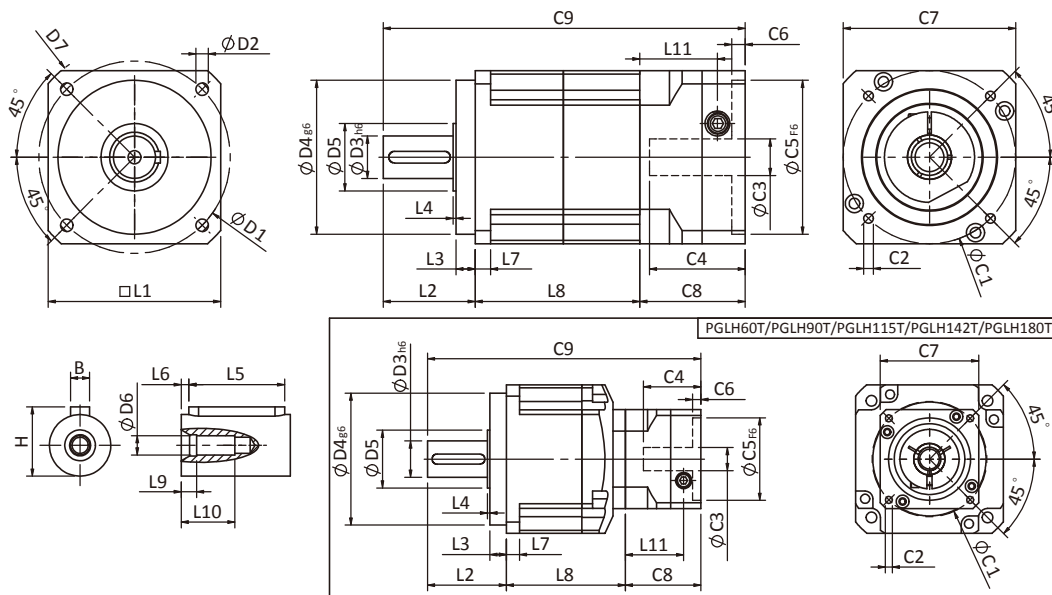
Unit:mm

Dimensions	PGLH42	PGLH60	PGLH90	PGLH115	PGLH142	PGLH180
D1	50	70	100	130	165	215
D2	3.4	5.5	6.5	8.5	10.5	13
D3 <sub>h6</sub>	13	16	22	32	40	55
D4 <sub>g6</sub>	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	63	91.5	100.5
L3	5.5	7	10	10	10	16
L4	1	1.5	1.5	3.5	2.5	2.5
L5	15	25	32	40	60	70
L6	2	2	3	5	5	6
L7	4	6	8	11	16	20
L8	28.3	37	46	57	75.5	94
L9	4	4	4.5	6	6	8
L10	14	16.5	20.5	30	38	48
L11	29	35.5	40.5	53.7	63	69.5
C1 <sup>2</sup>	46	70	90	115	145	200
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 <sup>2</sup>	≤8/≤14	≤14/≤19	≤19/≤24	≤24/≤32/≤38	≅ 35/≅ 38	≅ 50
C4 <sup>2</sup>	27	37	41	56.3	66.5	82
C5 <sup>2</sup> <sub>F6</sub>	30	50	70	95	110	114.3
C6 <sup>2</sup>	4	4	6	10	5.5	13
C7 <sup>2</sup>	42.6	60	90	115	140	182
C8 <sup>2</sup>	38.5	46	55	75	80	95
C9 <sup>2</sup>	92.8	120	149	195	247	289.5
B	5	5	6	10	12	16
H	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.

## PGLH Double Stage Dimensions



## Specifications

Unit:mm

Dimensions	PGLH42	PGLH60	PGLH60T	PGLH90	PGLH90T	PGLH115T	PGLH142T	PGLH180T
D1	50	70		100		130	165	215
D2	3.4	5.5		6.5		8.5	10.5	13
D3 h6	13	16		22		32	40	55
D4 g6	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		63	91.5	100.5
L3	5.5	7		10		10	10	16
L4	1	1.5		1.5		3.5	2.5	2.5
L5	15	25		32		40	60	70
L6	2	2		3		5	5	6
L7	4	6		8		11	16	20
L8	55.3	70	65.5	90	78.5	99.5	127.5	166
L9	4	4		4.5		6	6	8
L10	14	16.5		20.5		30	38	48
L11	29	35.5	29	40.5	35.5	40.7	42	63
C1 <sup>2</sup>	46	70	46	90	70	90	115	145
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P
C3 <sup>2</sup>	≤8/≤14	≤14/≤19	≤8/≤14	≤19/≤24	≤14/≤19	≤19/≤24	≤24/≤32/≤38	≤35/≤50
C4 <sup>2</sup>	27	37	27	41	37	46	56	66.5
C5 <sup>2</sup> F6	30	50	30	70	50	70	95	110
C6 <sup>2</sup>	4	4	4	6	4	10	10	5.5
C7 <sup>2</sup>	42.6	60	42.6	90	60	90	115	140
C8 <sup>2</sup>	38.5	46	38.5	55	46	60	63	80
C9 <sup>2</sup>	119.8	153	141	193	172.5	222.5	282	346.5
B	5	5		6		10	12	16
H	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.

## PGLH Specifications Table

Specifications		Stage	Ratio	PGLH-42	PGLH-60	PGLH-90	PGLH-115	PGLH-142	PGLH-180
Nominal Output Torque $T_{2N}$	N • m	1	3	19	53	145	290	520	950
			4	20	55	150	300	550	1000
			5	17	54	140	290	530	1050
			6	15	46	135	280	490	1000
			7	14	44	125	270	450	960
			8	12	41	110	240	390	900
			9	11	37	95	220	360	800
		10	11	37	95	220	360	800	
		Stage	Ratio	PGLH-42	PGLH-60 / PGLH-60T	PGLH-90 / PGLH-90T	PGLH-115T	PGLH-142T	PGLH-180T
		2	15	19	53	145	290	520	950
			20	20	55	150	300	550	1000
			25	17	54	140	290	530	1050
			30	17	54	140	290	530	1050
			35	17	54	140	290	530	1050
			40	17	54	140	290	530	1050
			45	17	54	140	290	530	1050
			50	17	54	140	290	530	1050
			60	15	46	135	280	490	1000
			70	14	44	125	270	450	960
80	12		41	110	240	390	900		
90	11		37	95	220	360	800		
100	11	37	95	220	360	800			
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 $n_{1N}$	rpm	1,2	3-100	4000	4000	3000	3000	2500	2500
Max. Input Speed $n_{1max}$	rpm	1,2	3-100	8000	8000	6000	6000	5000	4000
Micro Backlash P0	arcmin	1	3-10	≤ 4	≤ 4	≤ 4	≤ 3	≤ 3	≤ 3
		2	12-100	≤ 6	≤ 6	≤ 6	≤ 5	≤ 5	≤ 5
Precision Backlash P1	arcmin	1	3-10	≤ 6	≤ 6	≤ 6	≤ 5	≤ 5	≤ 5
		2	12-100	≤ 8	≤ 8	≤ 8	≤ 7	≤ 7	≤ 7
Standard Backlash P2	arcmin	1	3-10	≤ 8	≤ 8	≤ 8	≤ 7	≤ 7	≤ 7
		2	12-100	≤ 10	≤ 10	≤ 10	≤ 9	≤ 9	≤ 9
Torsional Rigidity	N • m / arcmin	1,2	3-100	2.5	6	12	23	45	75
Max. Radial Load $F_{2rB}^1$	N	1,2	3-100	640	1260	2230	4300	7140	11050
Max. Axial Load $F_{2aB}^1$	N	1,2	3-100	410	600	1500	3310	4670	6460
Operating Temp.	°C		3-100	-10 °C ~ +90 °C					
Service Life	hr		3-100	20,000 (10,000/ Continuous operation)					
Efficiency	%	1	3-10	≥ 97%					
		2	12-100	≥ 94%					
Weight	kg	1	3-10	0.6	1.3	3.5	7.8	16.1	27
		2	12-100	0.9	2.0/1.6	5.6/3.9	9.5	19	34
Mounting Position	-	1,2	3-100	Any direction					
Noise Level <sup>2</sup>	dB(A)/1m	1,2	3-100	58	60	63	65	67	68
Protection Class	-	1,2	3-100	IP65					
Lubrication	-	1,2	3-100	Synthetic Lubricant					
Inertia (J1)									
Stage	Ratio	unit		PGLH-42	PGLH-60	PGLH-90	PGLH-115	PGLH-142	PGLH-180
1	3	Kg • cm <sup>2</sup>		0.03	0.23	0.97	2.35	10.00	30.50
	4			0.02	0.18	0.67	1.66	7.17	25.86
	5			0.02	0.17	0.65	1.50	6.52	23.63
	6/7/8			0.02	0.14	0.60	1.45	6.17	22.92
	9/10			0.02	0.14	0.58	1.41	6.10	22.73
Stage	Ratio			PGLH-42	PGLH-60(T)	PGLH-90(T)	PGLH-115T	PGLH-142T	PGLH-180T
2	15/20/25			0.02	0.17(0.02)	0.65(0.17)	0.65	1.50	6.52
	30/35/40			0.02	0.14(0.02)	0.60(0.14)	0.60	1.45	6.17
	45/50/60/70/80/90/100			0.02	0.14(0.02)	0.58(0.14)	0.58	1.41	6.10

\* 1. Applied to the output shaft center @100rpm.

\* 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.

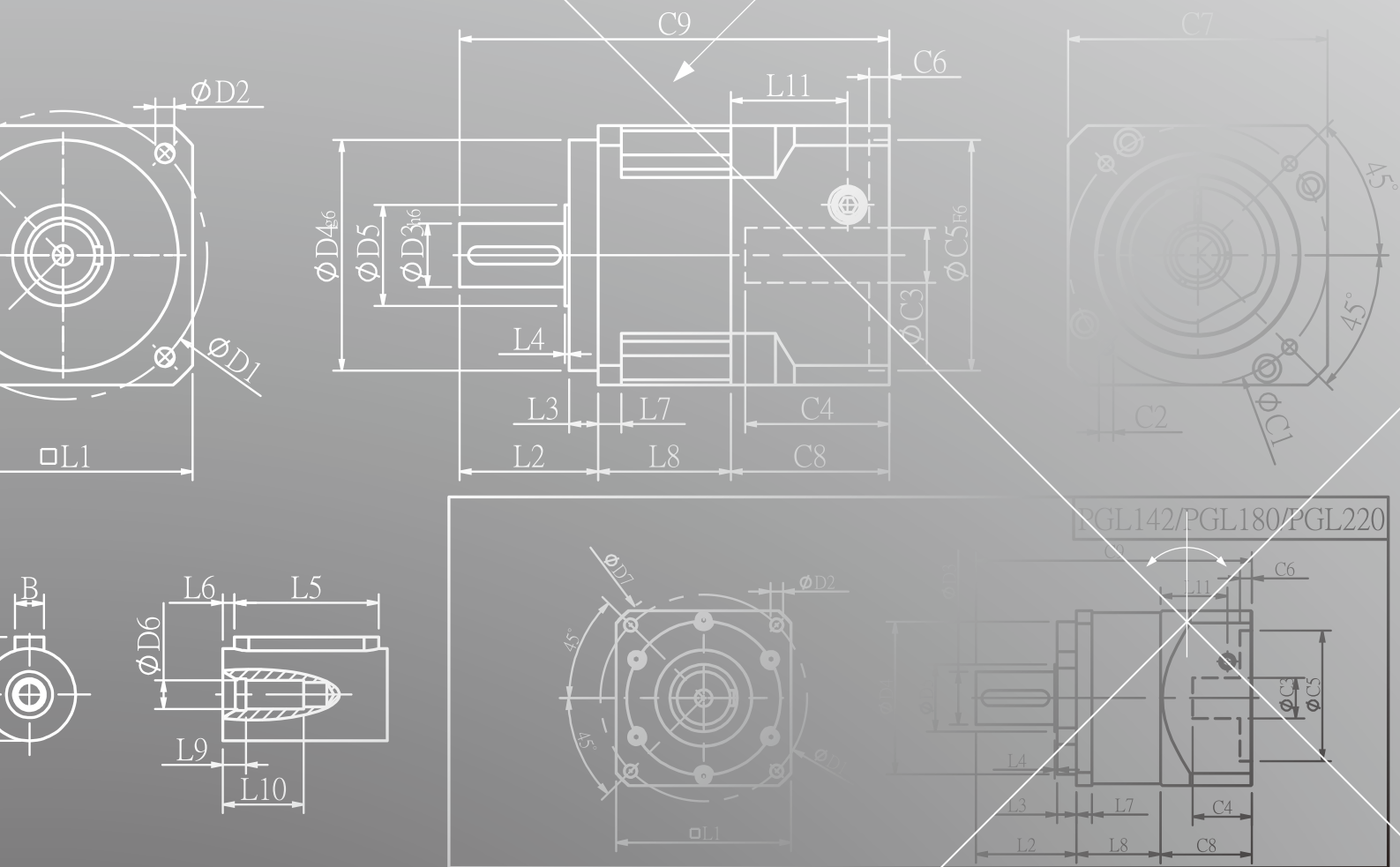
# SERVO MOTOR GEARHEADS

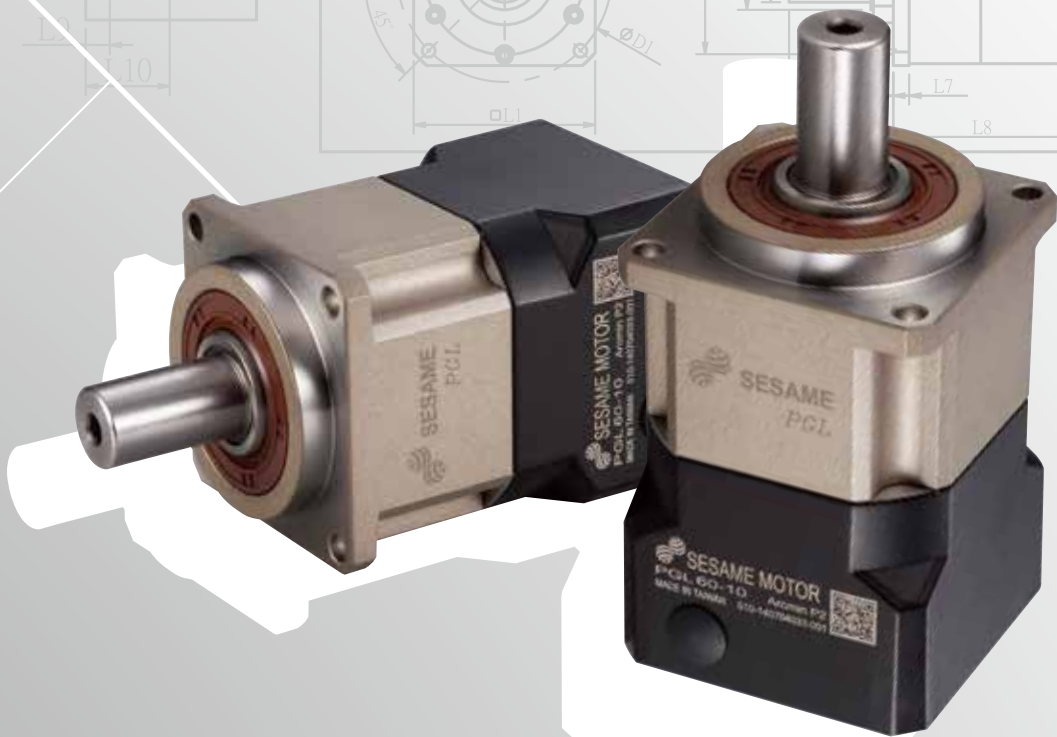
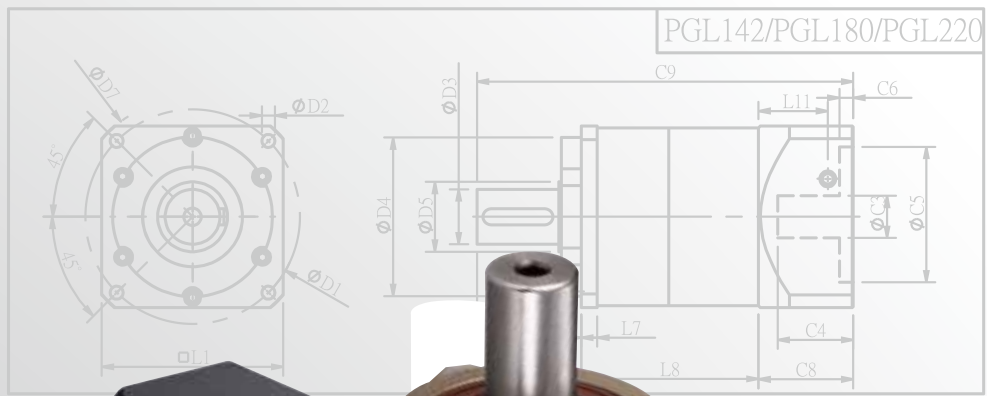
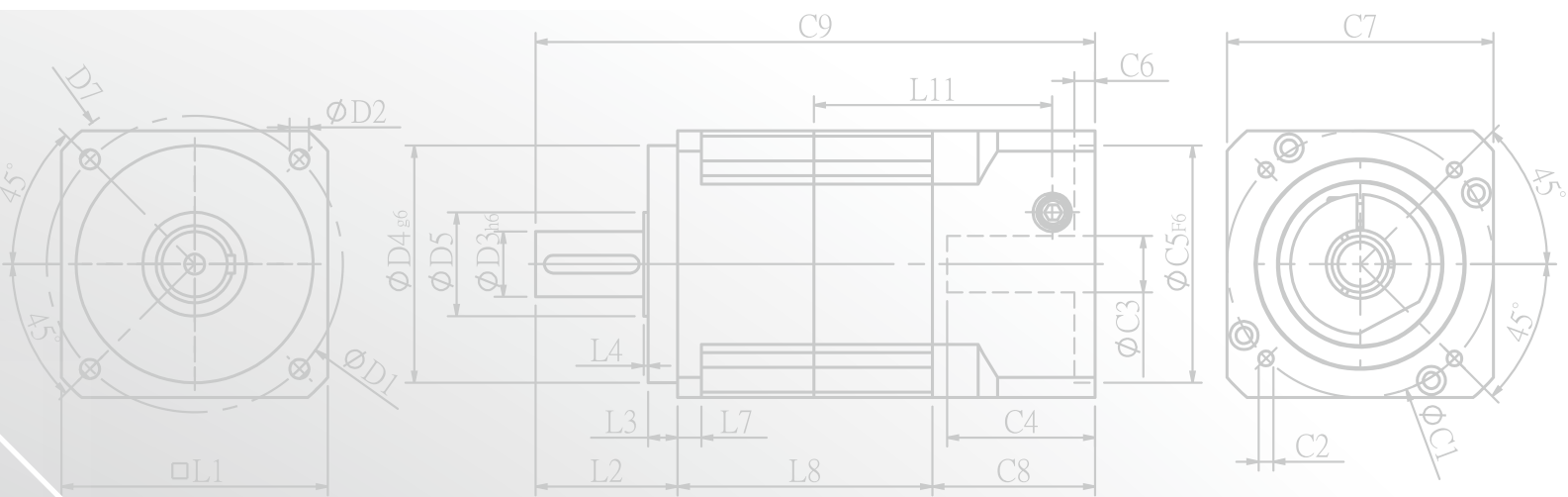


- PHL
- PHFR
- PHF
- PGH
- PUR
- PUL
- PGLH**
- PGL
- PGC
- PGE
- PGRH
- PCR
- PGFR
- PGF
- PBC
- PBE
- PAE
- PAC
- PAN
- PGS
- PNS



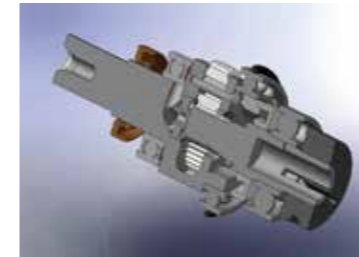
# PGL SERIES





PGL SERIES FEATURES

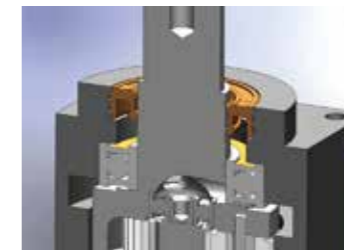
Alloy steel gear with unique heat treatment. Additionally, with gear grinding processing to get the best accuracy, high wear resistance and high impact toughness.



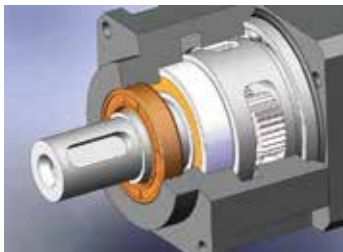
The sun gear bearing is placed directly into the planetary arm bracket, the overall mechanical structure designed to ensure concentricity of the transmission components.



Planetary arm bracket and output shaft are one-piece constructed, setting bearing apart for larger span to reach the largest reverse rigid and contribute high axis radial load capacity.

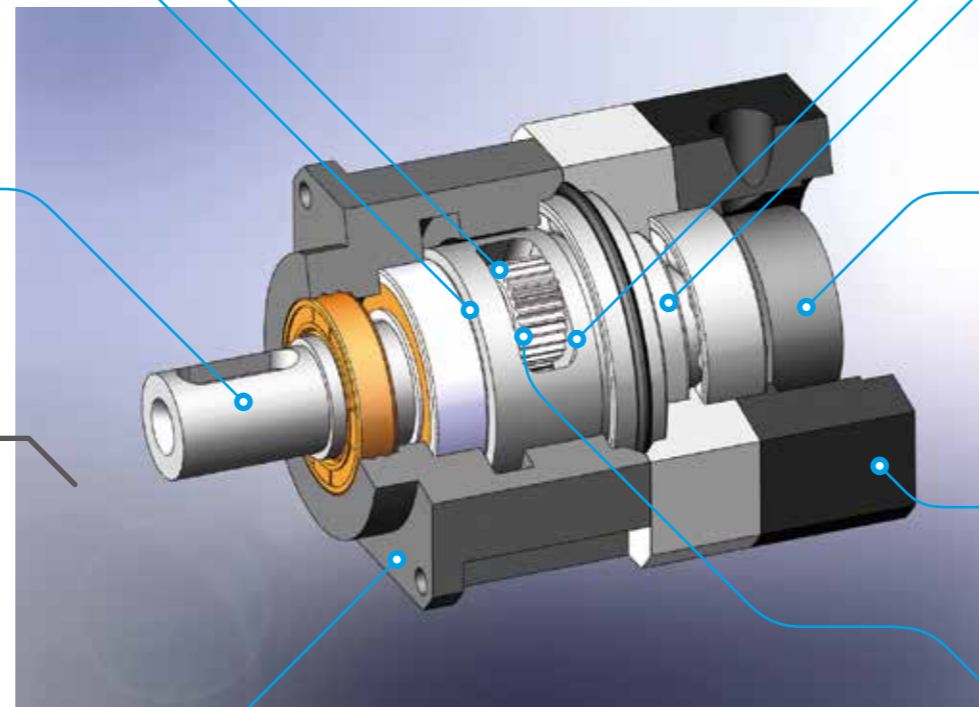


High-tech oil seal design on the upper lip guard against dust intruder, lower lip to guard against oil leak. Advanced lubricants grease and IP65 protection safeguards fully avoid leaking and given it maintenance-free.

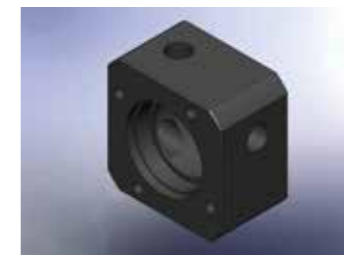


Grinding process to smooth surface of output shaft, and with oil-seal to minimum friction coefficient and reducing start up load; result in the best seal-ability and extended lifespan.

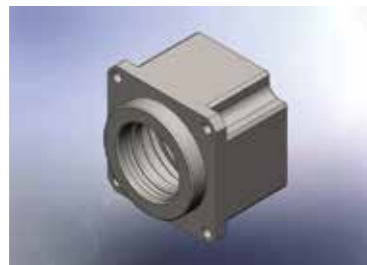
**PGL Series overall design suitable for combination operation with servo motor high-speed input and achieves maximum torque output. Precision gear design and gear processing, create a low backlash operation, high efficiency, low noise and long-life of the planetary gear.**



Input-end and motor shaft are coupled through a dynamic balanced collar clamping mechanism to ensure connection interface concentricity and zero slip power transmission at high speed.



Advanced motor bracket design coupled with the input shaft bushing is easy to mount to any servo or stepper motor.



Advanced electroless nickel plating surface treatment resists scratch and corrosion. Suitable for stringent require of high-tech equipment. The gear box and internal gear ring are one-piece constructed, and then processed with advanced Germany gear shaper machinery for high-precision, high torque and abrade consumption.

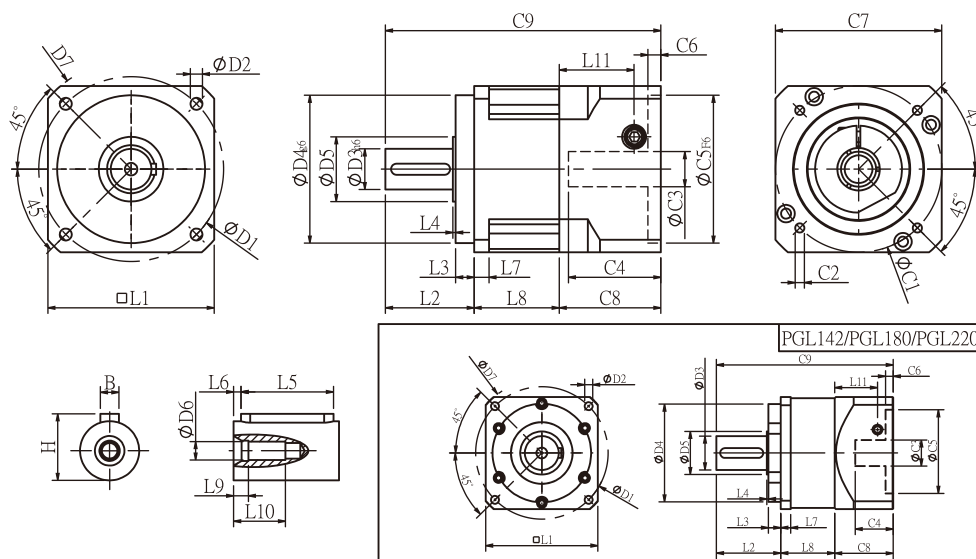


Planet gear transmission interface equipped with needle bearings, full needle roller bearings aligned without retainer achieve maximum exposure but smallest gap tolerances. Enhance over-all gear structure rigid and output torque.

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

PHL  
PHR  
PL  
PGH  
PUR  
PUL  
PGLH  
PGL  
PGC  
PGE  
PGRH  
PGR  
PGRF  
PGF  
PBC  
PBE  
PAE  
PAC  
PAN  
PGS  
PNS

## PGL Single Stage Dimensions



## Specifications

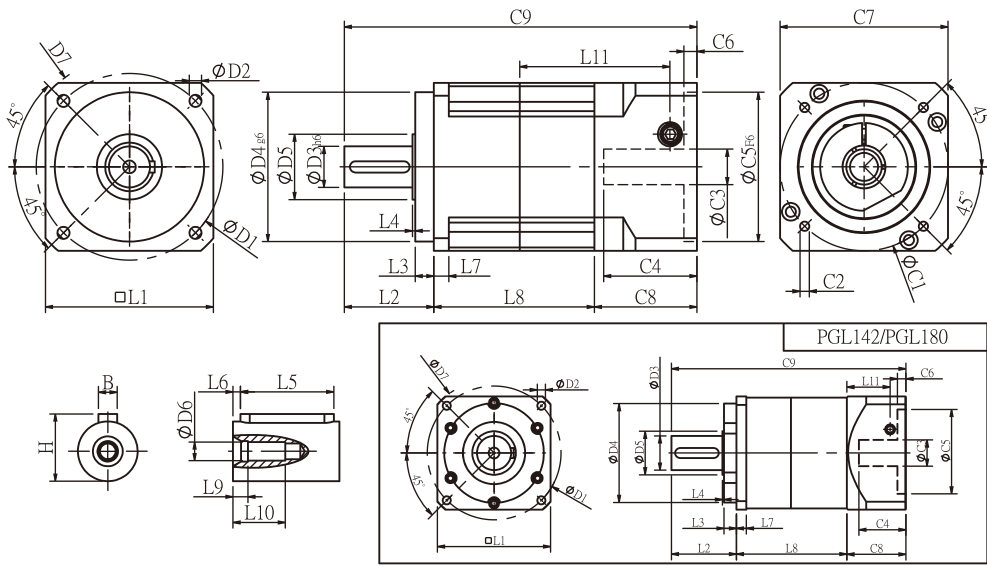
Unit:mm

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
D3 h6	13	16	22	32	40	55	75
D4 g6	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 <sup>2</sup>	46	70	90	115	145	200	235
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P	M12x1.75P
C3 <sup>2</sup>	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50	≤55
C4 <sup>2</sup>	27	37	47	58	66	82	98
C5 <sup>2</sup> F6	30	50	70	95	110	114.3	200
C6 <sup>2</sup>	4	4	6	10	6	13	12
C7 <sup>2</sup>	42.6	60	90	115	140	182	220
C8 <sup>2</sup>	38.5	46	55	63	80	95	130
C9 <sup>2</sup>	92.8	119	149	184	252	287	385.5
B	5	5	6	10	12	16	20
H	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.

★ Specification subject to change without notice.

## PGL Double Stage Dimensions-1



## Specifications

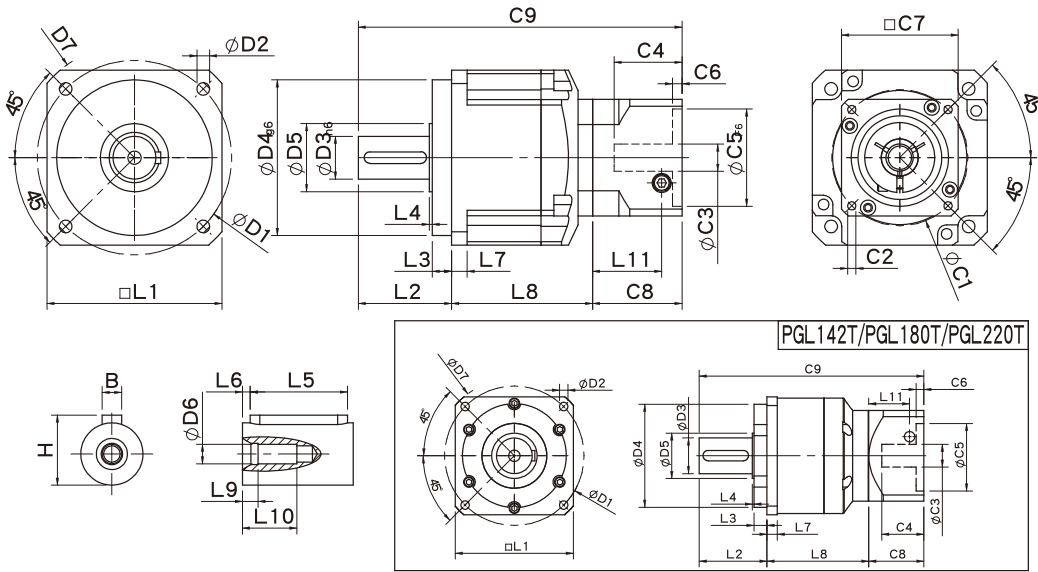
Unit:mm

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
D3 h6	13	16	22	32	40	55
D4 g6	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	20.5	30	38	48
L11	29	35.5	40.5	42	63	69.5
C1 <sup>2</sup>	46	70	90	115	145	200
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 <sup>2</sup>	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50
C4 <sup>2</sup>	27	37	47	58	66	82
C5 <sup>2</sup> F6	30	50	70	95	110	114.3
C6 <sup>2</sup>	4	4	6	10	6	13
C7 <sup>2</sup>	42.6	60	90	115	140	182
C8 <sup>2</sup>	38.5	46	55	63	80	95
C9 <sup>2</sup>	118.8	147	189	232	313	377
B	5	5	6	10	12	16
H	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.

★ 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
D3 <sub>h6</sub>	16	22	32	40	55	75
D4 <sub>g6</sub>	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	12	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	20.5	30	38	48	42
L11	29	35.5	40.5	42	63	69.5
C1 <sup>2</sup>	46	70	90	115	145	200
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 <sup>2</sup>	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50
C4 <sup>2</sup>	27	37	47	58	66	82
C5 <sup>2</sup> <sub>F6</sub>	30	50	70	95	110	114.3
C6 <sup>2</sup>	4	4	6	10	6	13
C7 <sup>2</sup>	42.6	60	90	115	140	182
C8 <sup>2</sup>	38.5	46	55	63	80	95
C9 <sup>2</sup>	134.3	166.5	214.4	283	341.5	432.5
B	5	6	10	12	16	20
H	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.

★ Specification subject to change without notice.

## PGL Specifications Table

Specifications		Stage	Ratio	PGL-42	PGL-60	PGL-90	PGL-115	PGL-142	PGL-180	PGL-220	
Nominal Output Torque $T_{2N}$	N • m	1	3	13.8	44.2	95.2	283	482	1151	1670	
			4	11.9	35.9	74.6	249	490	1055	1574	
			5	13.8	43.0	95.2	283	473	1151	1670	
			6	12.5	39.4	90.9	266	436	1055	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 (T)	PGL-90(T)	PGL-115(T)	PGL-142(T)	PGL-180(T)	PGL-220 T
			15	13.8	44.2	95.2	283	482	1151	1670	
		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		
		40	13.8	43.0	95.2	283	473	1151	1670		
		45	13.8	43.0	95.2	283	473	1151	1670		
		50	13.8	43.0	95.2	283	473	990	1670		
		60	12.5	39.4	90.9	266	436	1055	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 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 $n_{1N}$	rpm	1,2	3-100	3000	3000	3000	2500	2000	2000	2000	
Max. Input Speed $n_{1max}$	rpm	1,2	3-100	6000	6000	6000	5000	4000	4000	4000	
Micro Backlash P0	arcmin	1	3-10	-	-	-	≤ 3	≤ 3	≤ 3	≤ 3	
		2	12-100	-	-	-	≤ 5	≤ 5	≤ 5	≤ 5	
Precision Backlash P1	arcmin	1	3-10	-	≤ 6	≤ 6	≤ 5	≤ 5	≤ 5	≤ 5	
		2	12-100	-	≤ 9	≤ 9	≤ 7	≤ 7	≤ 7	≤ 7	
Standard Backlash P2	arcmin	1	3-10	≤ 12	≤ 9	≤ 9	≤ 7	≤ 7	≤ 7	≤ 7	
		2	12-100	≤ 15	≤ 12	≤ 12	≤ 9	≤ 9	≤ 9	≤ 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	-10 °C ~ +90 °C							
Service Life	hr		3-100	20,000 (10,000/Continuous operation)							
Efficiency	%	1	3-10	≥ 96%							
		2	12-100	≥ 92%							
Weight	kg	1	3-10	0.6	1.2	3.2	7.5	15.6	26	56	
		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 Position	-	1,2	3-100	Any direction							
Noise Level <sup>2</sup>	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	Synthetic Lubricant							
Inertia(J1)											
Stage	Ratio	unit	PGL-42	PGL-60	PGL-90	PGL-115	PGL-142	PGL-180	PGL-220		
1	3	Kg • cm <sup>2</sup>	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		
	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		
	9/10		0.02	0.14	0.60	1.53	5.20	17.6	52.9		
Stage	Ratio		PGL-42	PGL-60(T)	PGL-90(T)	PGL-115(T)	PGL-142(T)	PGL-180(T)	PGL-220 T		
2	15/20/25		0.02	0.15(0.02)	0.62(0.15)	1.61(0.62)	5.38(1.61)	18.3(5.38)	53.9(18.3)		
	30/35/40		0.02	0.14(0.02)	0.60(0.14)	1.55(0.60)	5.22(1.55)	17.8(5.22)	53.0(17.8)		
	45/50/60/70/80/90/100		0.02	0.14(0.02)	0.60(0.14)	1.53(0.60)	5.20(1.53)	17.6(5.20)	52.9(17.6)		

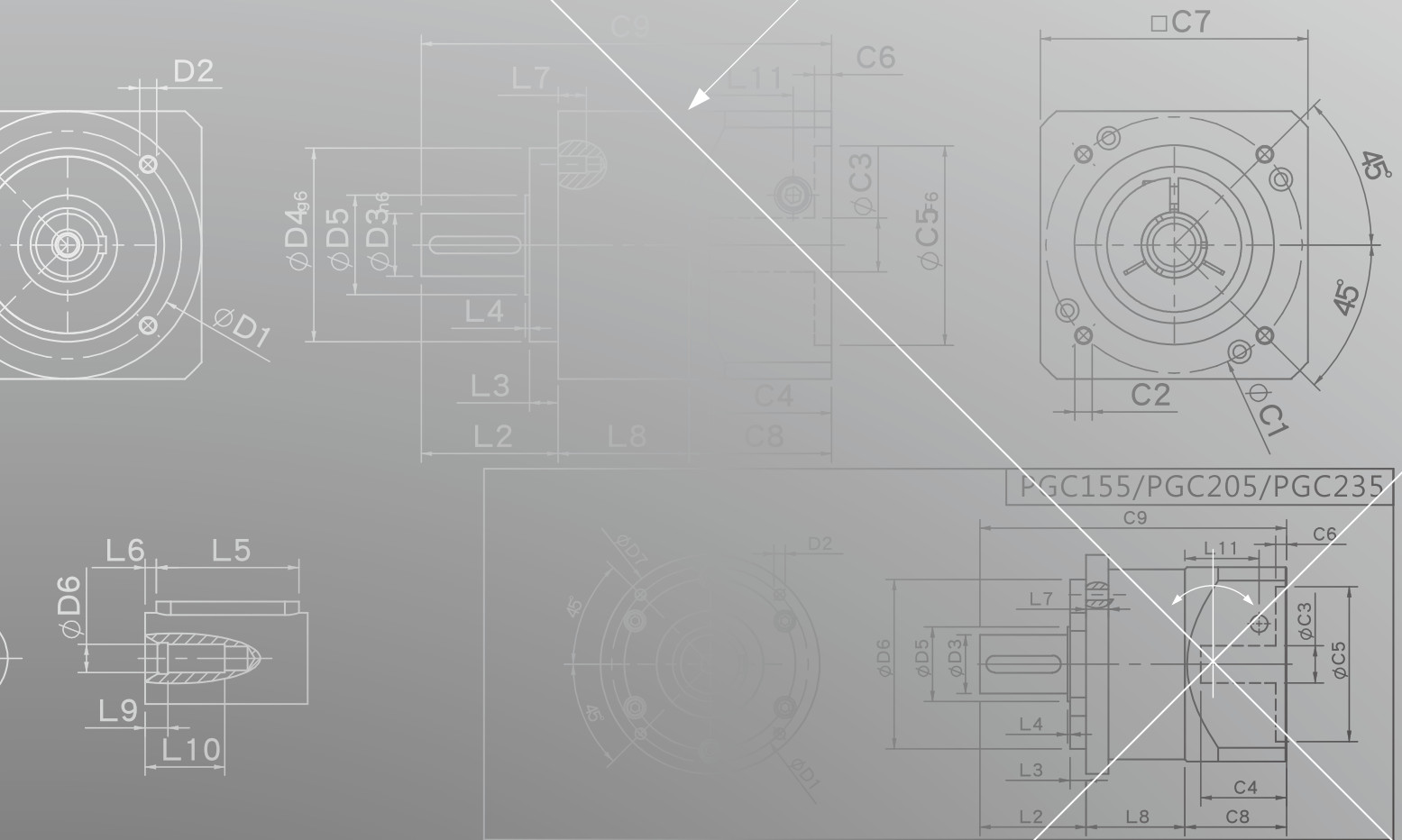
\* 1. Applied to the output shaft center @100rpm.

\* 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.

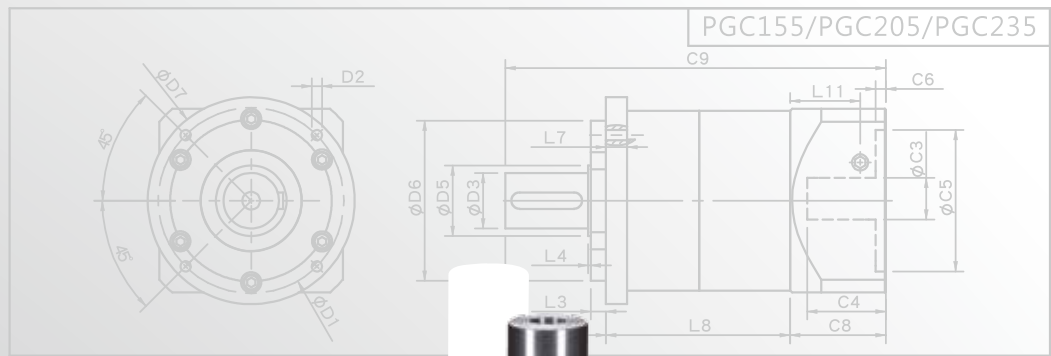
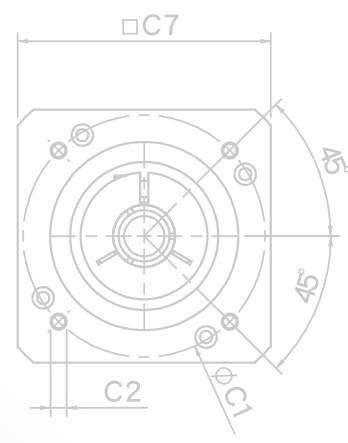
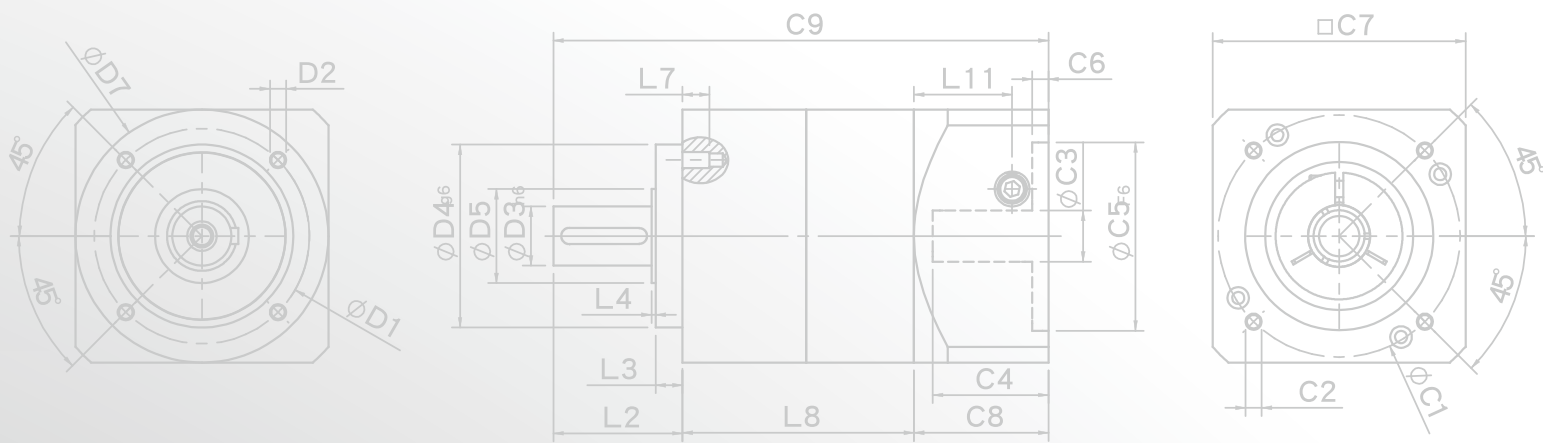
※ The above figures/specifications are subject to change without prior notice.

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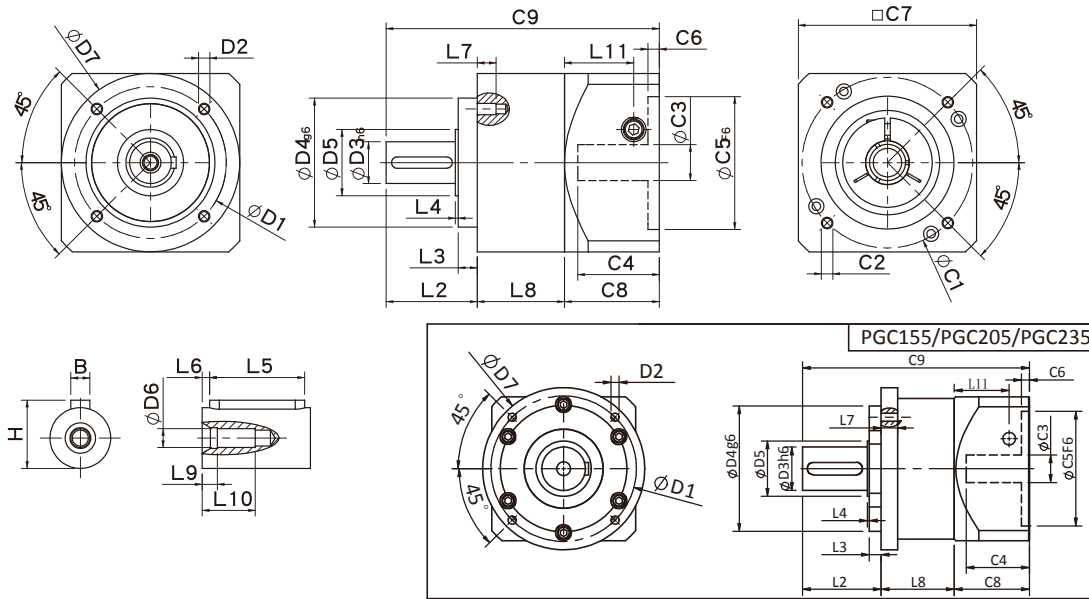
# PGC SERIES







## PGC Single Stage Dimensions



## Specifications

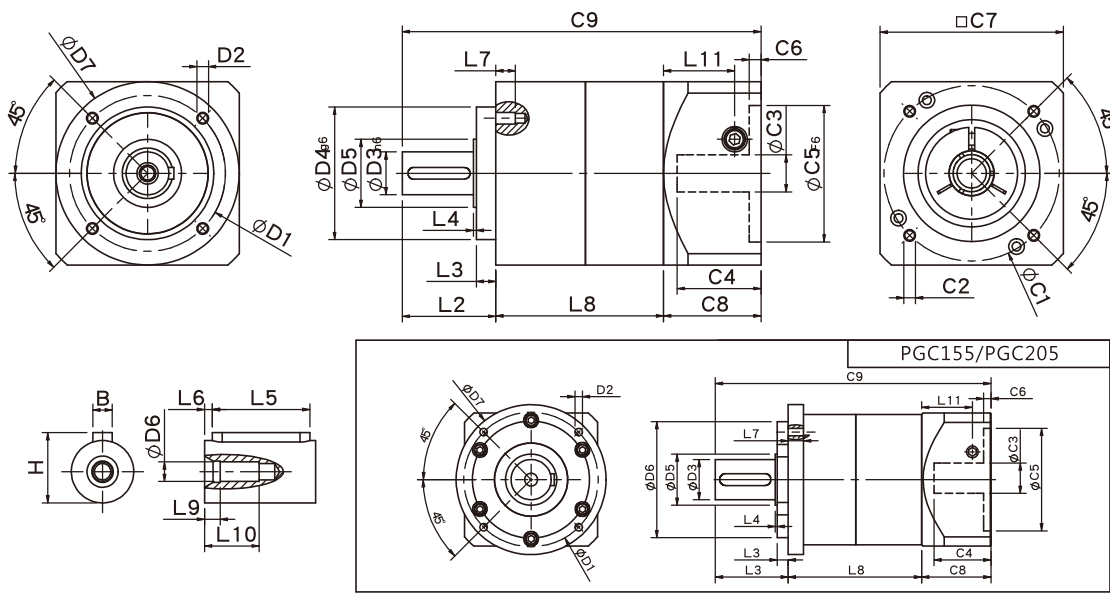
Unit:mm

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
D3 <sub>h6</sub>	13	16	22	32	40	55	75
D4 <sub>g6</sub>	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 <sup>2</sup>	46	70	90	115	145	200	235
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P	M12x1.75P
C3 <sup>2</sup>	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50	≤55
C4 <sup>2</sup>	27	35	43	58	66	82	98
C5 <sup>2</sup> <sub>F6</sub>	30	50	70	95	110	114.3	200
C6 <sup>2</sup>	4	5	5	8	6	13	12
C7 <sup>2</sup>	50	70	94	120	140	182	220
C8 <sup>2</sup>	38.5	46	55	63	80	95	130
C9 <sup>2</sup>	93	119	149	184	252	287	385.5
B	5	5	6	10	12	16	20
H	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.

★ Specification subject to change without notice.

## PGC Double Stage Dimensions-1



## Specifications

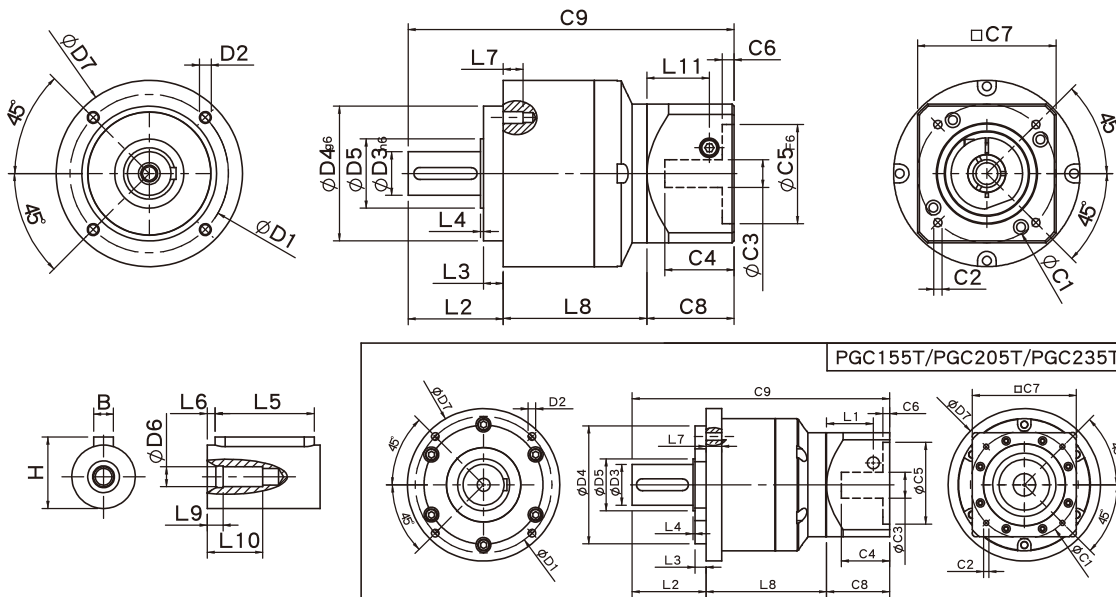
Unit:mm

Dimensions	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 <sub>h6</sub>	13	16	22	32	40	55
D4 <sub>g6</sub>	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 <sup>2</sup>	46	70	90	115	145	200
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 <sup>2</sup>	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50
C4 <sup>2</sup>	27	35	43	58	66	82
C5 <sup>2</sup> <sub>F6</sub>	30	50	70	95	110	114.3
C6 <sup>2</sup>	4	5	5	8	6	13
C7 <sup>2</sup>	50	70	94	120	140	182
C8 <sup>2</sup>	38.5	46	55	63	80	95
C9 <sup>2</sup>	119	147	189	232	313	377
B	5	5	6	10	12	16
H	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.

★ Specification subject to change without notice.

## PGC Double Stage Dimensions-2



## Specifications

Unit:mm

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
D3 <sub>h6</sub>	16	22	32	40	55	75
D4 <sub>g6</sub>	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	32.5	40	60	70	90
L6	2	3	5	5	6	7
L7	10	10	15	18	21	32
L8	60.8	70.5	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 <sup>2</sup>	66.67	70	90	115	145	200
C2 <sup>2</sup>	M5x0.8P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 <sup>2</sup>	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50
C4 <sup>2</sup>	27	41	47.75	58	66	82
C5 <sup>2</sup> <sub>F6</sub>	38.1	50	70	95	110	114.3
C6 <sup>2</sup>	4	8	6	8	6	13
C7 <sup>2</sup>	60	70	94	120	140	182
C8 <sup>2</sup>	38.5	50	55	63	80	95
C9 <sup>2</sup>	134.3	170.5	214.4	283	341.5	432.5
B	5	6	10	12	16	20
H	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.

★ Specification subject to change without notice.

## PGC Specifications Table

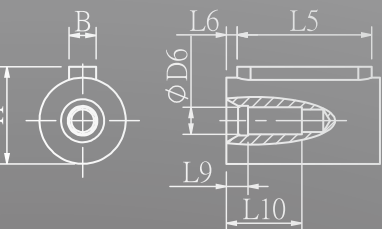
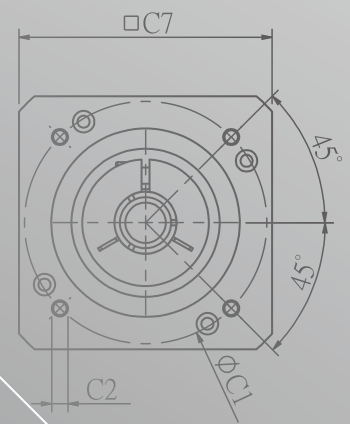
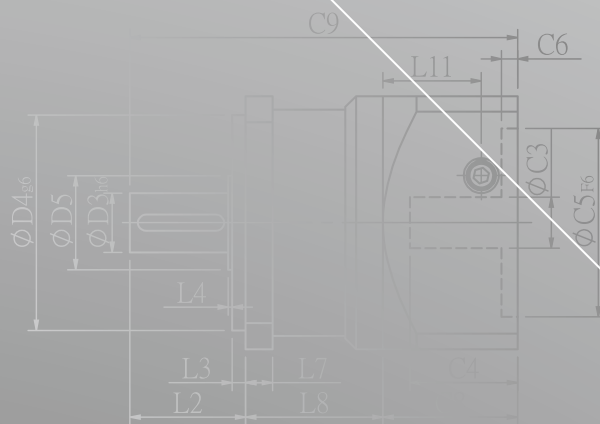
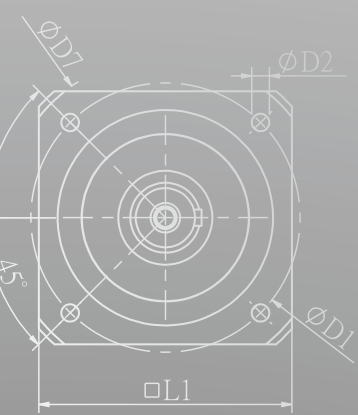
Specifications		Stage	Ratio	PGC-50	PGC-70	PGC-90	PGC-120	PGC-155	PGC-205	PGC-235
Nominal Output Torque $T_{2N}$	N • m	1	3	13.8	44.2	95.2	283	482	1151	1670
			4	11.9	35.9	74.6	249	490	1055	1574
			5	13.8	43.0	95.2	283	473	1151	1670
			7	11.9	36.0	85.6	219	400	1055	1574
			10	10.1	25.0	75.0	210	320	763	1184
		Stage	Ratio	PGC-50	PGC-70(T)	PGC-90(T)	PGC-120(T)	PGC-155(T)	PGC-205(T)	PGC-235T
		2	15	13.8	44.2	95.2	283	482	1151	1670
			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
			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	3.0 times 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 $n_{1max}$	rpm	1,2	3-100	6000	6000	6000	5000	4000	4000	4000
Micro Backlash $P_0$	arcmin	1	3-10	-	-	-	≤ 3	≤ 3	≤ 3	≤ 3
		2	12-100	-	-	-	≤ 5	≤ 5	≤ 5	≤ 5
Precision Backlash $P_1$	arcmin	1	3-10	-	≤ 6	≤ 6	≤ 5	≤ 5	≤ 5	≤ 5
		2	12-100	-	≤ 9	≤ 9	≤ 7	≤ 7	≤ 7	≤ 7
Standard Backlash $P_2$	arcmin	1	3-10	≤ 12	≤ 9	≤ 9	≤ 7	≤ 7	≤ 7	≤ 7
		2	12-100	≤ 15	≤ 12	≤ 12	≤ 9	≤ 9	≤ 9	≤ 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	-10 °C ~ +90 °C								
Service Life	hr	20,000 (10,000/ Continuous operation)								
Efficiency	%	1	3-10	≥ 96%						
		2	12-100	≥ 92%						
Weight	kg	1	3-10	0.7	1.4	3.0	7.3	15.6	26	56
		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	Any direction						
Noise Level <sup>2</sup>	dB(A)/1m	1,2	3-100	60	62	65	65	70	70	75
Protection Class	-	1,2	3-100	IP65						
Lubrication	-	1,2	3-100	Synthetic Lubricant						
Inertia(J1)										
Stage	Ratio	unit	PGC-50	PGC-70	PGC-90	PGC-120	PGC-155	PGC-205	PGC-235	
1	3	Kg • cm <sup>2</sup>	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	
	5		0.02	0.15	0.62	1.61	5.38	18.3	53.3	
	7		0.02	0.14	0.60	1.55	5.22	17.8	53.0	
	10		0.02	0.14	0.60	1.53	5.20	17.6	52.9	
Stage	Ratio		PGC-50	PGC-70(T)	PGC-90(T)	PGC-120(T)	PGC-155(T)	PGC-205(T)	PGC-235T	
2	15/20/25		0.02	0.15(0.02)	0.62(0.15)	1.61(0.62)	5.38(1.61)	18.3(5.38)	53.9(18.3)	
	30/35/40		0.02	0.14(0.02)	0.60(0.14)	1.55(0.60)	5.22(1.55)	17.8(5.22)	53.0(17.8)	
	50/70/100		0.02	0.14(0.02)	0.60(0.14)	1.53(0.60)	5.20(1.53)	17.6(5.20)	52.9(17.6)	

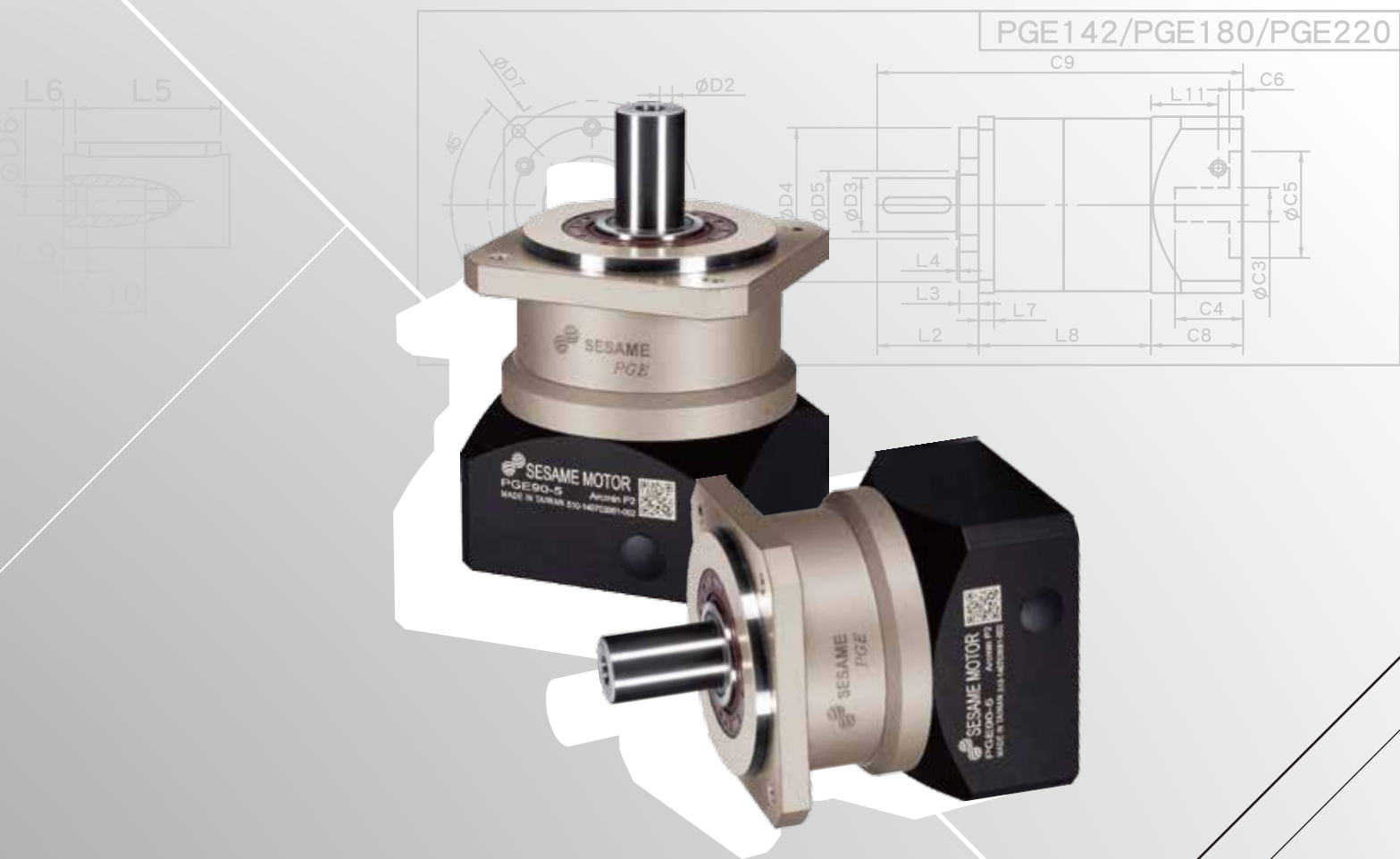
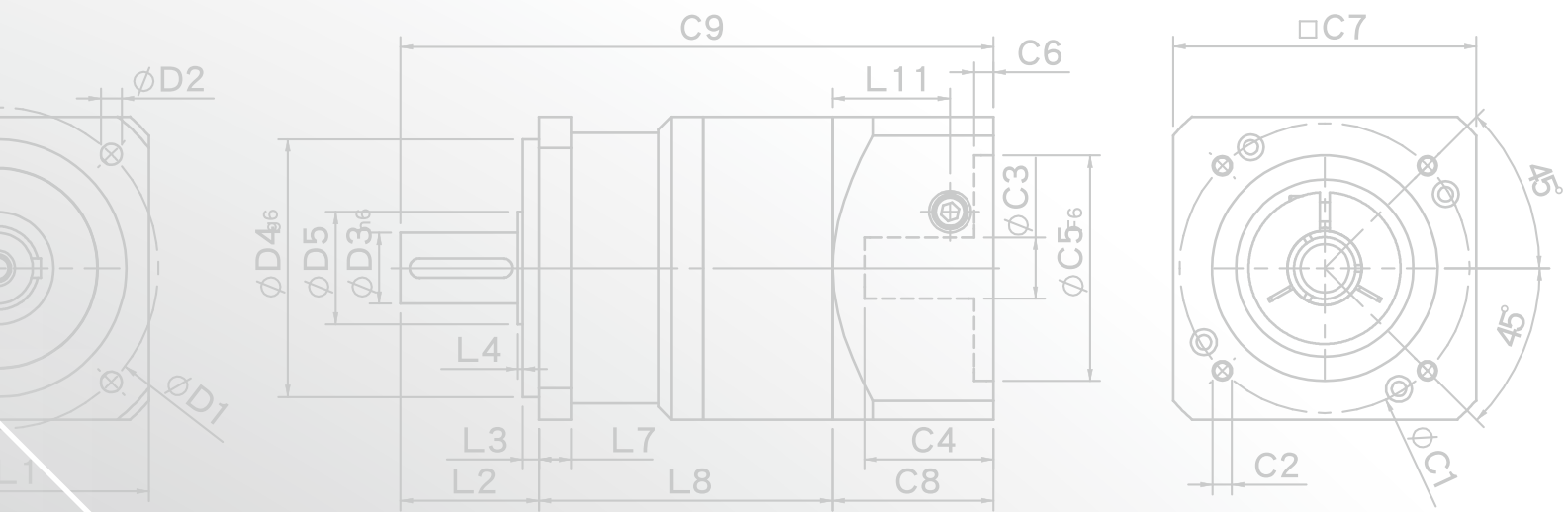
\* 1. Applied to the output shaft center @100rpm. \* 2. Measured at 3000 rpm with no load. These values are measured by gearbox with ratio = 10 (1-stage) or ratio = 100 (2-stage) at nominal input speed or 3000 rpm (if nominal input speed is higher than 3000 rpm) with no load.

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

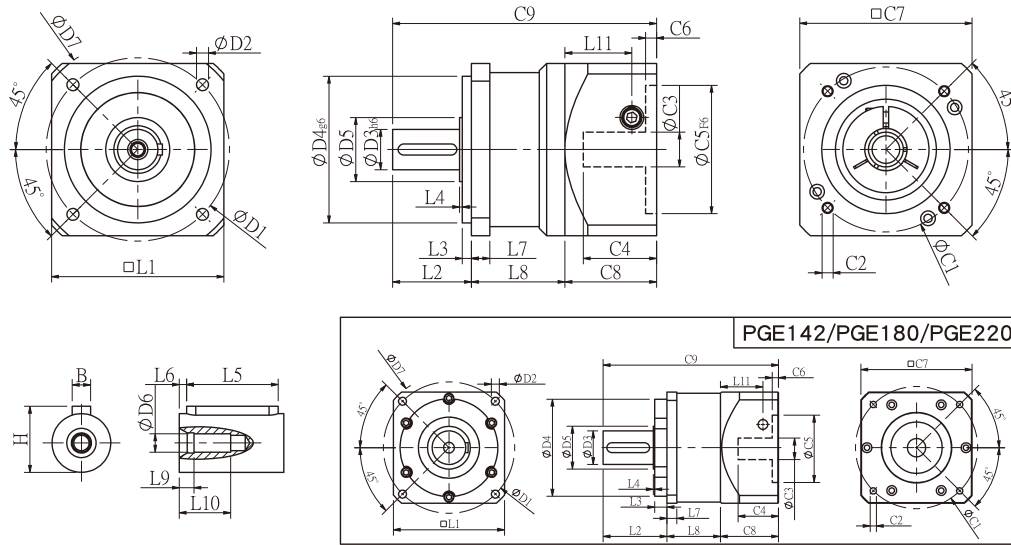
Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

# PGE SERIES





## PGE Single Stage Dimensions



## Specifications

Unit:mm

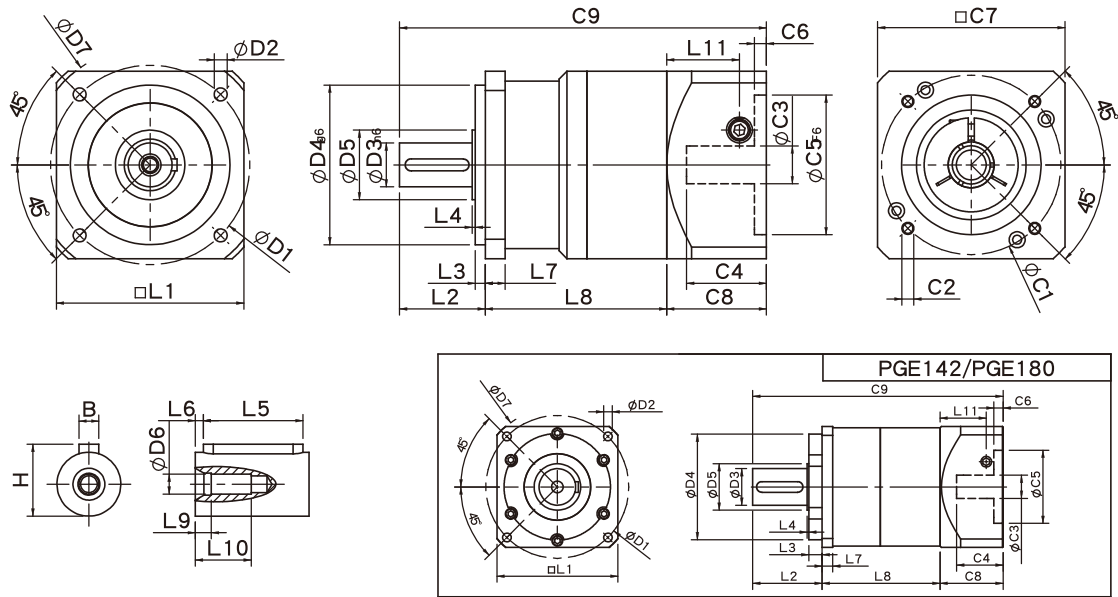
Dimensions	PGE50	PGE70	PGE90	PGE120	PGE142	PGE180	PGE220
D1	50	70	100	130	165	215	250
D2	3.4	6	6.5	8.5	10.5	13	17
D3 <sub>h6</sub>	13	16	22	32	40	55	75
D4 <sub>g6</sub>	35	50	80	110	130	160	180
D5	15	25	35	45	50	70	90
D6	M4x0.7P	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	64	90	120	152	186	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 <sup>2</sup>	46	70	90	115	145	200	235
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P	M12x1.75P
C3 <sup>2</sup>	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50	≤55
C4 <sup>2</sup>	27	35	43	58	66	82	98
C5 <sup>2</sup> <sub>F6</sub>	30	50	70	95	110	114.3	200
C6 <sup>2</sup>	4	5	5	8	6	13	12
C7 <sup>2</sup>	50	70	94	120	140	182	220
C8 <sup>2</sup>	38.5	46	55	63	80	95	130
C9 <sup>2</sup>	93	119	149	184	252	287	385.5
B	5	5	6	10	12	16	20
H	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.

★ Specification subject to change without notice.



## PGE Double Stage Dimensions-1

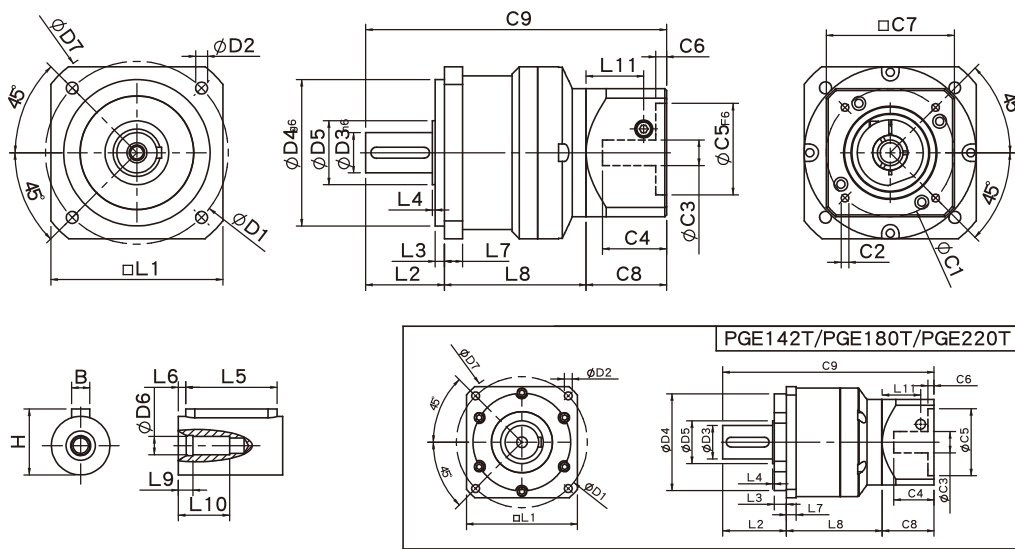


## Specifications Unit:mm

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
D3 h <sub>6</sub>	13	16	22	32	40	55
D4 g <sub>6</sub>	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	20.5	30	38	48
L11	24.4	31.5	36.5	42	63	69.5
C1 <sup>2</sup>	46	70	90	115	145	200
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 <sup>2</sup>	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50
C4 <sup>2</sup>	27	35	43	58	66	82
C5 <sup>2</sup> F <sub>6</sub>	30	50	70	95	110	114.3
C6 <sup>2</sup>	4	5	5	8	6	13
C7 <sup>2</sup>	50	70	94	120	140	182
C8 <sup>2</sup>	38.5	46	55	63	80	95
C9 <sup>2</sup>	119	147	189	232	313	377
B	5	5	6	10	12	16
H	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.  
 \* 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 <sub>h6</sub>	16	22	32	40	55	75
D4 <sub>g6</sub>	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
C1 <sup>2</sup>	66.67	70	90	115	145	200
C2 <sup>2</sup>	M5x0.8P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 <sup>2</sup>	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50
C4 <sup>2</sup>	27	41	47.75	58	66	82
C5 <sup>2</sup> <sub>F6</sub>	38.1	50	70	95	110	114.3
C6 <sup>2</sup>	4	8	6	8	6	13
C7 <sup>2</sup>	60	70	94	120	140	182
C8 <sup>2</sup>	38.5	50	55	63	80	95
C9 <sup>2</sup>	134.3	170.5	214.4	283	341.5	432.5
B	5	6	10	12	16	20
H	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.

★ Specification subject to change without notice.

## PGE Specifications Table

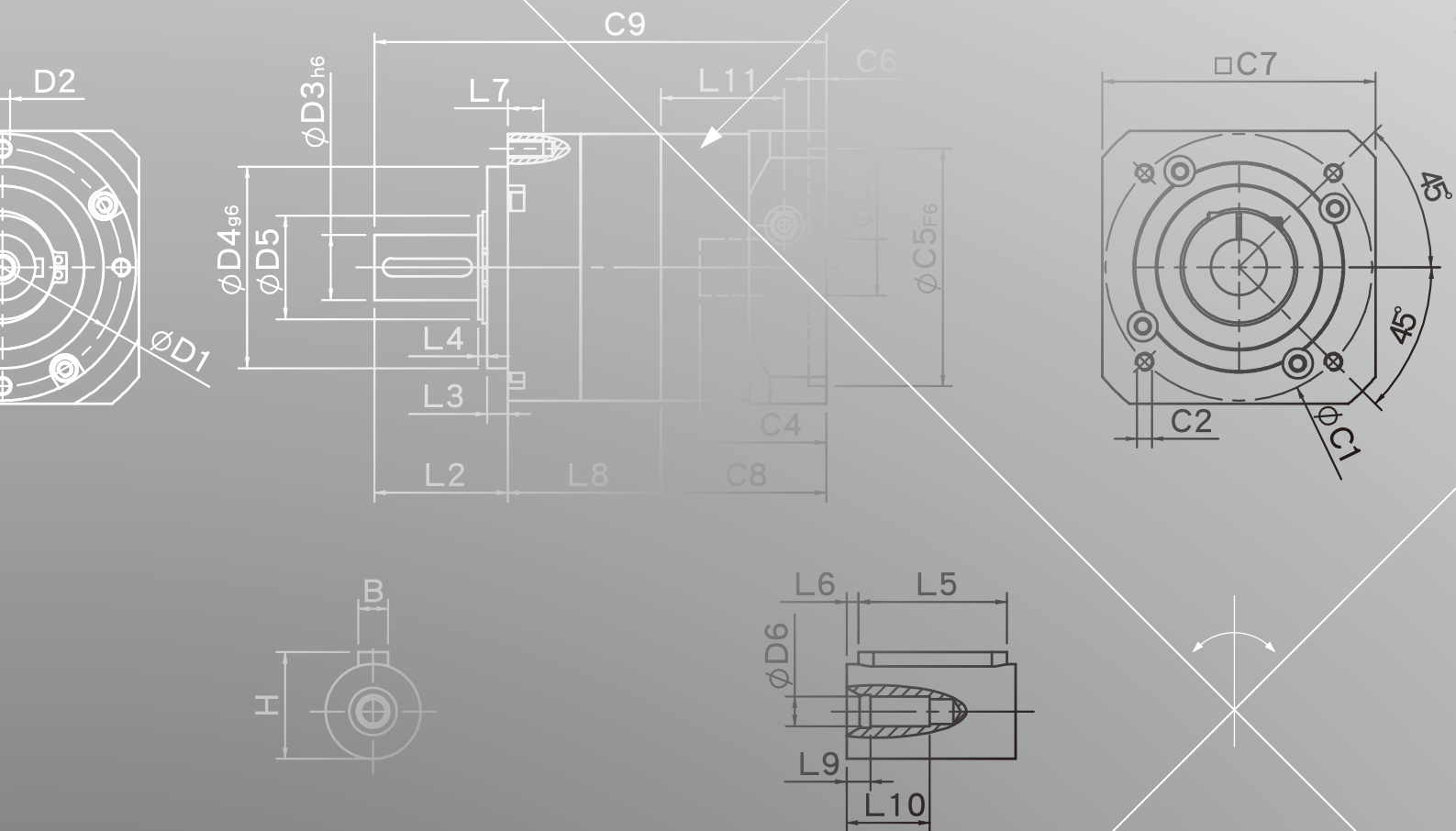
Specifications		Stage	Ratio	PGE-50	PGE-70	PGE-90	PGE-120	PGE-142	PGE-180	PGE-220
Nominal Output Torque $T_{2N}$	N • m	1	3	13.8	44.2	95.2	283	482	1151	1670
			4	11.9	35.9	74.6	249	490	1055	1574
			5	13.8	43.0	95.2	283	473	1151	1670
			7	11.9	36.0	85.6	219	400	1055	1574
			10	10.1	25.0	75.0	210	320	763	1184
		Stage	Ratio	PGE-50	PGE-70(T)	PGE-90(T)	PGE-120(T)	PGE-142(T)	PGE-180(T)	PGE-220 T
		2	15	13.8	44.2	95.2	283	482	1151	1670
			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
			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	3.0 times 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 $n_{1max}$	rpm	1,2	3-100	6000	6000	6000	5000	4000	4000	4000
Micro Backlash P0	arcmin	1	3-10	-	-	-	≤ 3	≤ 3	≤ 3	≤ 3
		2	12-100	-	-	-	≤ 5	≤ 5	≤ 5	≤ 5
Precision Backlash P1	arcmin	1	3-10	-	≤ 6	≤ 6	≤ 5	≤ 5	≤ 5	≤ 5
		2	12-100	-	≤ 9	≤ 9	≤ 7	≤ 7	≤ 7	≤ 7
Standard Backlash P2	arcmin	1	3-10	≤ 12	≤ 9	≤ 9	≤ 7	≤ 7	≤ 7	≤ 7
		2	12-100	≤ 15	≤ 12	≤ 12	≤ 9	≤ 9	≤ 9	≤ 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	450	1200	2050	4250	7680	9080	13500
Max. Axial Load $F_{2aB}^{-1}$	N	1,2	3-100	320	900	1420	2930	4680	5100	7300
Operating Temp.	°C	-10 °C ~ +90 °C								
Service Life	hr	20,000 (10,000/ Continuous operation)								
Efficiency	%	1	3-10	≥ 96%						
		2	12-100	≥ 92%						
Weight	kg	1	3-10	0.7	1.4	3.0	7.3	15.6	26	56
		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	Any direction						
Noise Level <sup>2</sup>	dB(A)/1m	1,2	3-100	60	62	65	65	70	70	75
Protection Class	-	1,2	3-100	IP65						
Lubrication	-	1,2	3-100	Synthetic Lubricant						
Inertia(J1)										
Stage	Ratio	unit	PGE-50	PGE-70	PGE-90	PGE-120	PGE-142	PGE-180	PGE-220	
1	3	Kg • cm <sup>2</sup>	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	
	5		0.02	0.15	0.62	1.61	5.38	18.3	53.3	
	7		0.02	0.14	0.60	1.55	5.22	17.8	53.0	
	10		0.02	0.14	0.60	1.53	5.20	17.6	52.9	
Stage	Ratio	PGE-50	PGE-70(T)	PGE-90(T)	PGE-120(T)	PGE-142(T)	PGE-180(T)	PGE-220 T		
2	15/20/25	0.02	0.15(0.02)	0.62(0.15)	1.61(0.62)	5.38(1.61)	18.3(5.38)	53.9(18.3)		
	30/35/40	0.02	0.14(0.02)	0.60(0.14)	1.55(0.60)	5.22(1.55)	17.8(5.22)	53.0(17.8)		
	50/70/100	0.02	0.14(0.02)	0.60(0.14)	1.53(0.60)	5.20(1.53)	17.6(5.20)	52.9(17.6)		

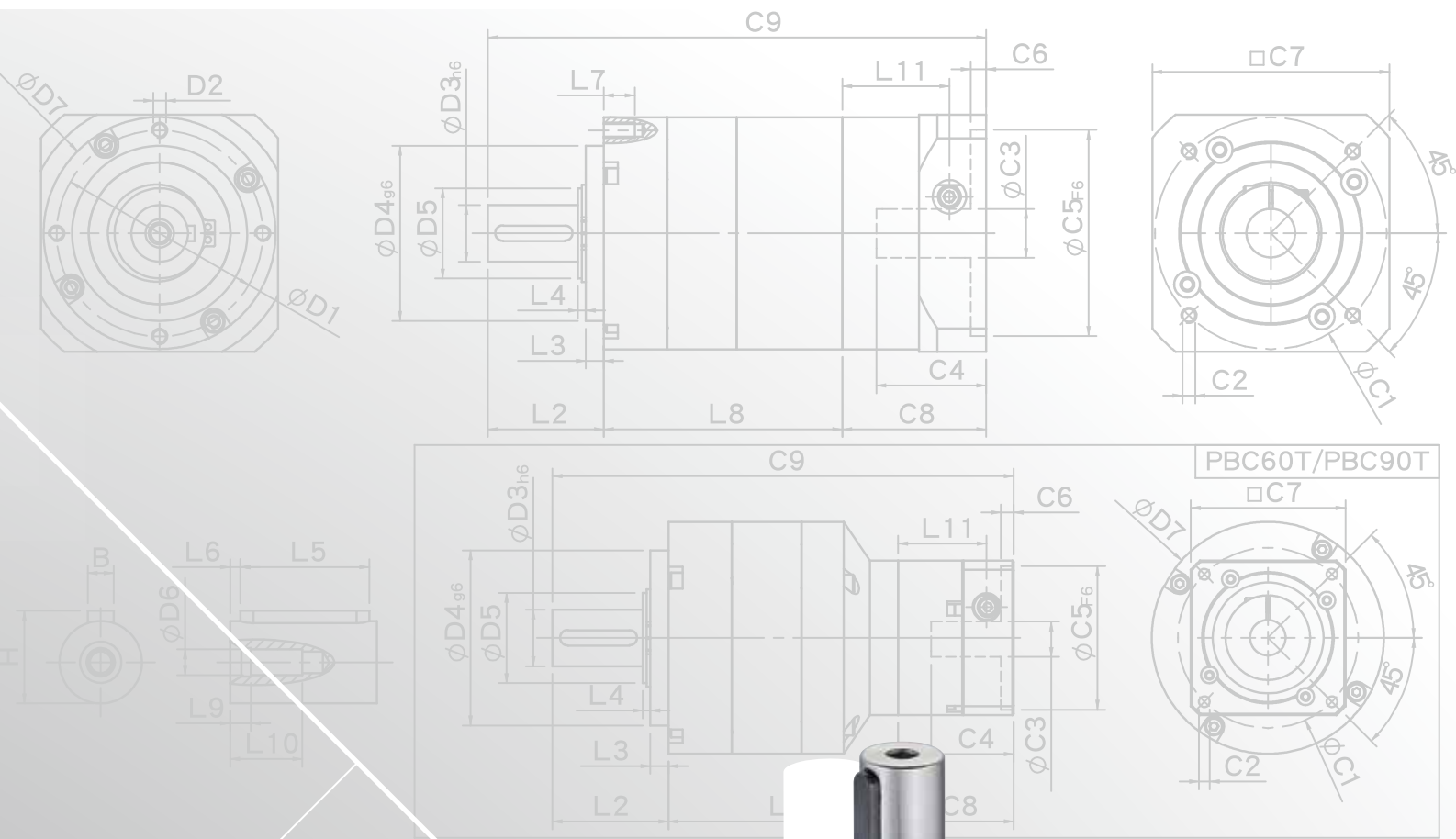
\* 1. Applied to the output shaft center @100rpm. \* 2. Measured at 3000 rpm with no load. These values are measured by gearbox with ratio = 10 (1-stage) or ratio = 100 (2-stage) at nominal input speed or 3000 rpm (if nominal input speed is higher than 3000 rpm) with no load.

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

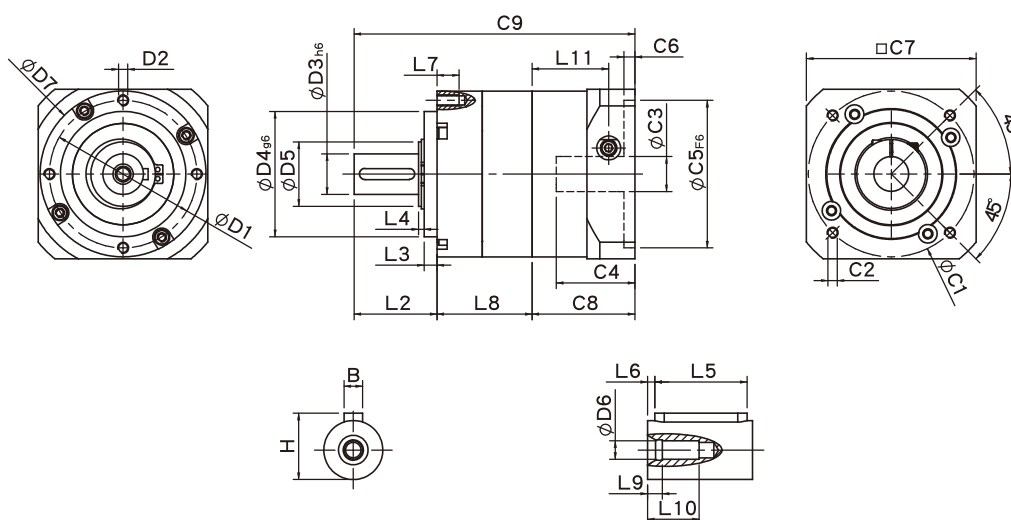
Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

# ***PBC*** SERIES





## PBC Single Stage Dimensions



## Specifications

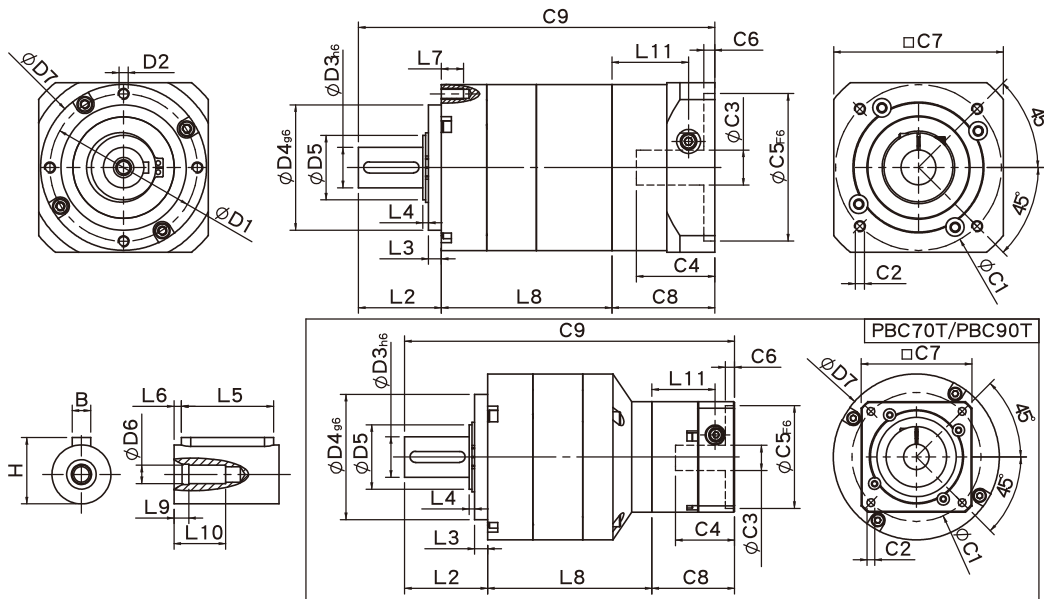
Unit:mm

Dimensions	PBC50	PBC70	PBC90
D1	44	62	80
D2	M4x0.7P	M5x0.8P	M6x1.0P
D3 <sub>h6</sub>	12	16	22
D4 <sub>g6</sub>	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 <sup>2</sup>	46	70	90
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M6x1.0P
C3 <sup>2</sup>	≤8/≤11	≤14/≤19	≤19/≤24/≤28
C4 <sup>2</sup>	26.5	33.5	41
C5 <sup>2</sup> <sub>F6</sub>	30	50	70
C6 <sup>2</sup>	4	4	6
C7 <sup>2</sup>	42.6	60	92
C8 <sup>2</sup>	36.4	44.8	55.8
C9 <sup>2</sup>	94.8	130.4	155.2
B	4	5	6
H	13.5	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.

## PBC Double Stage Dimensions



## Specifications

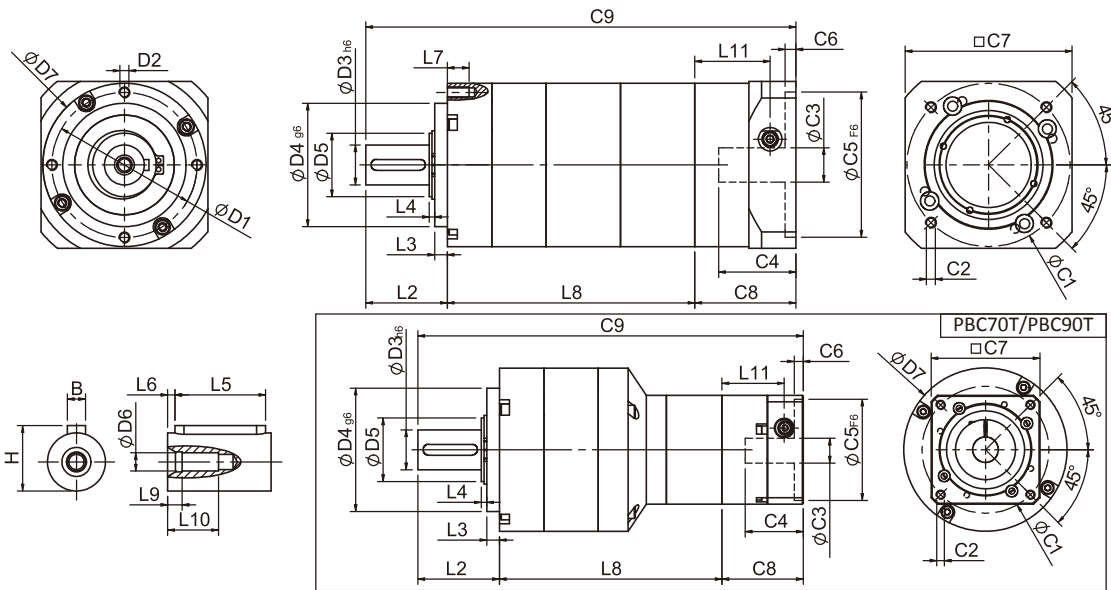
Unit:mm

Dimensions	PBC50	PBC70	PBC70T	PBC90	PBC90T
D1	44	62		80	
D2	M4x0.7P	M5x0.8P		M6x1.0P	
D3 <sub>h6</sub>	12	16		22	
D4 <sub>g6</sub>	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	57.3	80.3	75.9	95.4	92
L9	4	4		4.5	
L10	14	16.5		20.5	
L11	26.9	34.3	26.9	41.55	34.3
C1 <sup>2</sup>	46	70	46	90	70
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P
C3 <sup>2</sup>	≤8/≤11	≤14/≤19	≤8/≤11	≤19/≤24/≤28	≤14/≤19
C4 <sup>2</sup>	26.5	33.5	26.5	41	33.5
C5 <sup>2</sup> <sub>F6</sub>	30	50	30	70	50
C6 <sup>2</sup>	4	4	4	6	4
C7 <sup>2</sup>	42.6	60	42.6	92	60
C8 <sup>2</sup>	36.4	44.8	36.4	55.8	44.8
C9 <sup>2</sup>	119.7	161.1	148.3	196.2	181.8
B	4	5		6	
H	13.5	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.

## PBC Triple Stage Dimensions



## Specifications

Unit:mm

Dimensions	PBC50	PBC70T	PBC90T
D1	44	62	80
D2	M4x0.7P	M5x0.8P	M6x1.0P
D3 <sub>h6</sub>	12	16	22
D4 <sub>g6</sub>	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 <sup>2</sup>	46	46	70
C2 <sup>2</sup>	M4x0.7P	M4x0.7P	M5x0.8P
C3 <sup>2</sup>	≤8/≤11	≤8/≤11	≤14/≤19
C4 <sup>2</sup>	26.5	26.5	33.5
C5 <sup>2</sup> <sub>F6</sub>	30	30	50
C6 <sup>2</sup>	4	4	4
C7 <sup>2</sup>	42.6	42.6	60
C8 <sup>2</sup>	36.4	36.4	44.8
C9 <sup>2</sup>	144.6	173.2	212.5
B	4	5	6
H	13.5	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.

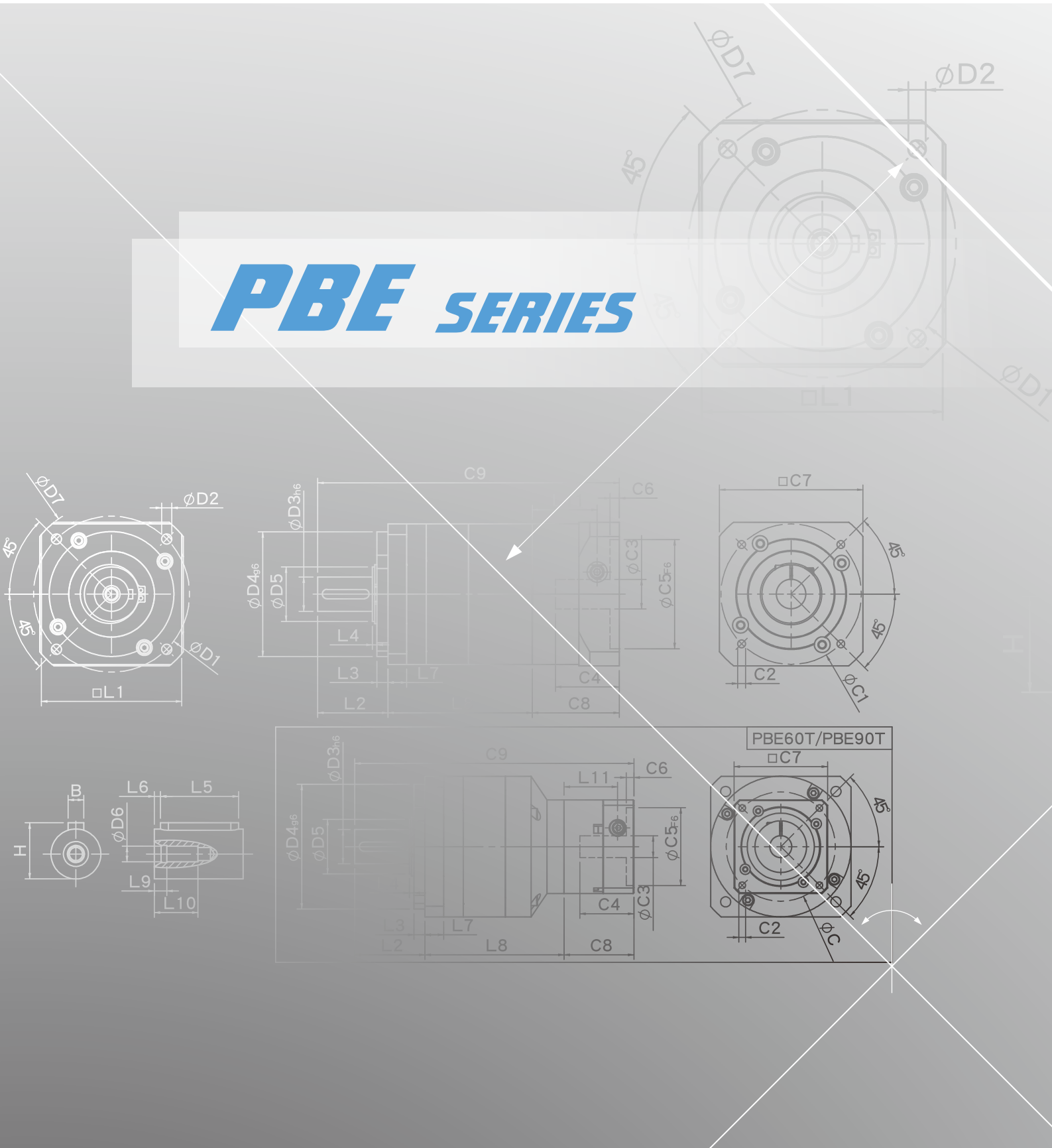


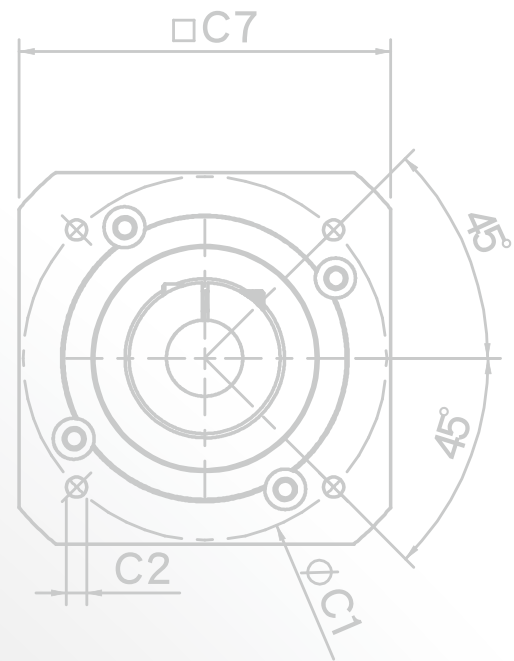
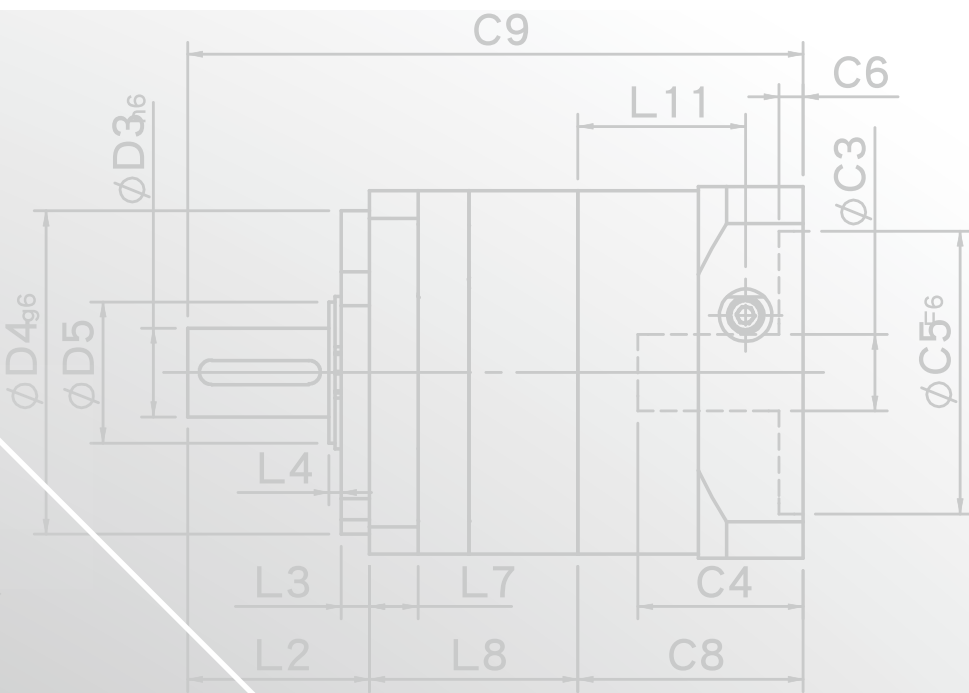
## PBC Specifications Table

Specifications		Stage	Ratio	PBC-50	PBC-70	PBC-90		
Nominal Output Torque $T_{2N}$	N • m	1	3	4.8	13.6	33.5		
			4	6.3	21.6	58.6		
			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	PBC-50	PBC-70(T)	PBC-90(T)		
		2	15	4.8	13.6	33.5		
			20	6.3	21.6	58.6		
			25	6.0	20.5	55.1		
			35	6.0	20.5	55.1		
			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	PBC-50	PBC-70(T)	PBC-90(T)		
		3	125	6.0	20.5	55.1		
			175	6.0	20.5	55.1		
			225	6.0	20.5	55.1		
			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		
		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 $n_{1N}$	rpm	1,2,3	3-729	4000	4000	3000
		Max. Input Speed $n_{1max}$	rpm	1,2,3	3-729	8000	6000	6000
		Backlash	arcmin	1	3-10	≤ 9	≤ 8	≤ 7
2	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	3-10	≥ 95%				
		2	15-81	≥ 90%				
		3	125-729	≥ 85%				
Weight	kg	1	3-10	0.5	1.2	3.1		
		2	15-81	0.7	1.7/1.5	4.7/3.6		
		3	125-729	0.9	2.0/1.8	5.3/4.0		
Mounting Position	-	1,2,3	3-729	Any direction				
Noise Level <sup>2</sup>	dBA/1m	1,2,3	3-729	≤ 62	≤ 64	≤ 67		
Protection Class	-	1,2,3	3-729	IP64				
Lubrication	-	1,2,3	3-729	Synthetic Lubricant				
* 1. Applied to the output shaft center @100rpm.								
* 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.								

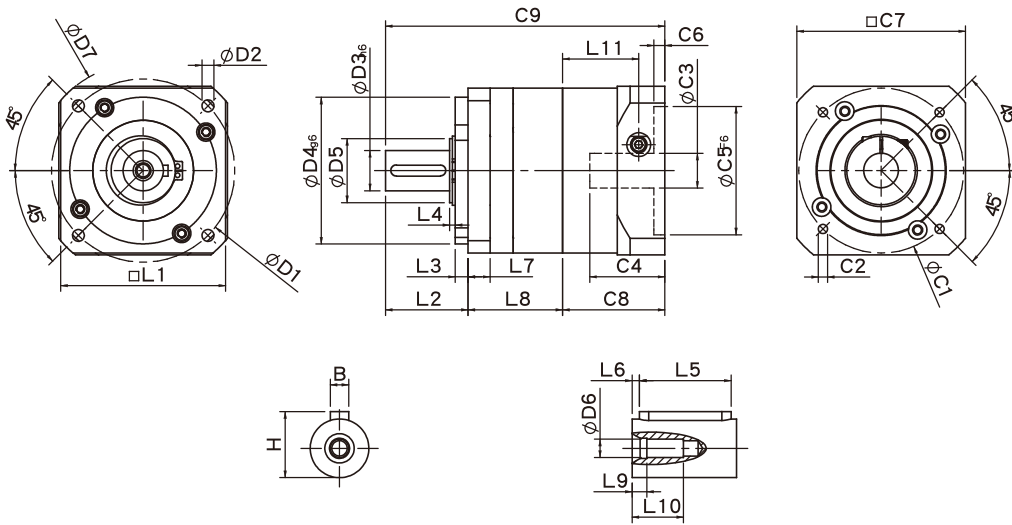
Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

# PBE SERIES





## PBE Single Stage Dimensions



## Specifications

Unit:mm

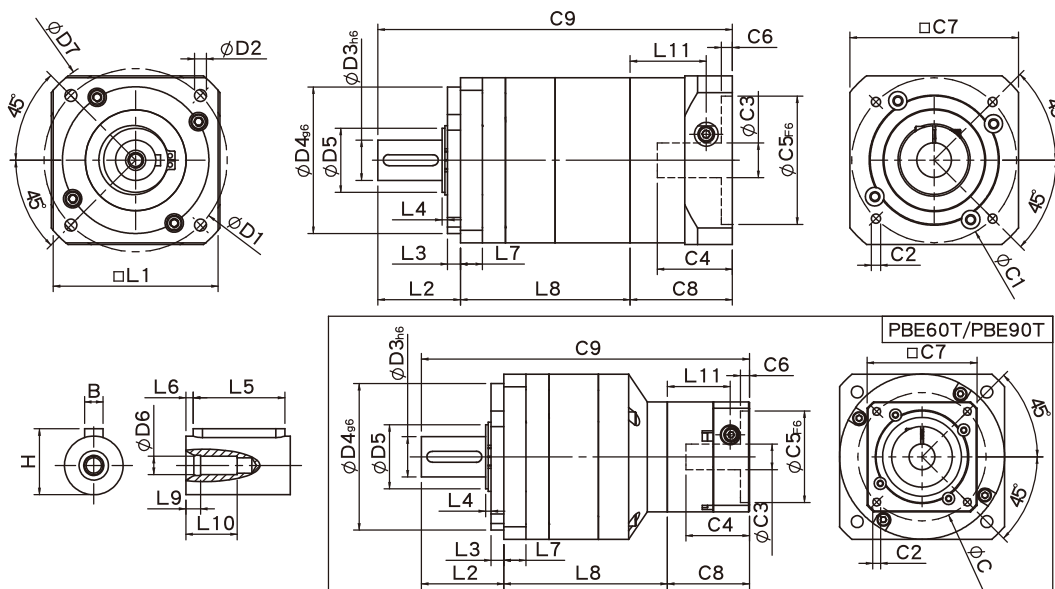
Dimensions	PBE42	PBE60	PBE90
D1	50	70	100
D2	3.4	5.5	6.5
D3 <sub>h6</sub>	13	16	22
D4 <sub>g6</sub>	35	50	80
D5	15	20	35
D6	M4x0.7P	M5x0.8P	M8x1.25P
D7	56	80	118
L1	42.6(44) <sup>1</sup>	60	90
L2	26	36	45
L3	5.5	5	7
L4	2.6	2.7	3
L5	15	25	30
L6	2	2	3
L7	8	10	12
L8	32.4	49.6	54.4
L9	4	4	4.5
L10	14	16.5	20.5
L11	26.9	34.3	41.5
C1 <sup>2</sup>	46	70	90
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M6x1.0P
C3 <sup>2</sup>	≤8/≤11	≤14/≤19	≤19/≤24/≤28
C4 <sup>2</sup>	26.5	33.5	41
C5 <sup>2</sup> <sub>F6</sub>	30	50	70
C6 <sup>2</sup>	4	4	6
C7 <sup>2</sup>	42.6	60	92
C8 <sup>2</sup>	36.4	44.8	55.8
C9 <sup>2</sup>	94.8	130.4	155.2
B	5	5	6
H	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.

★ L1=44 when gear ratio is 10.

## PBE Double Stage Dimensions



## Specifications

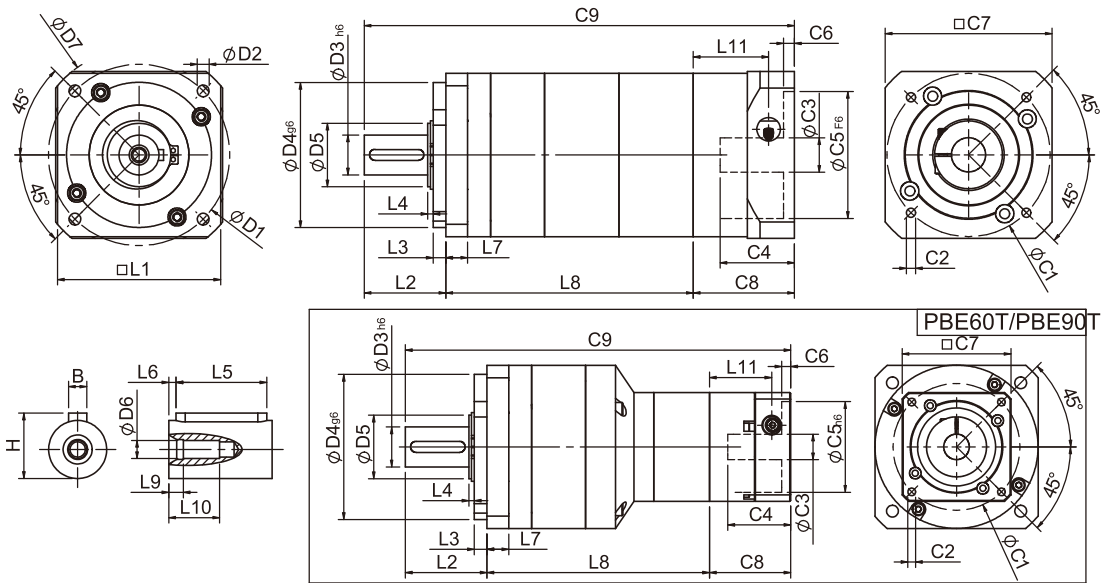
Unit:mm

Dimensions	PBE42	PBE60/PBE60T		PBE90/PBE 90T	
D1	50	70		100	
D2	3.4	5.5		6.5	
D3 <sub>h6</sub>	13	16		22	
D4 <sub>g6</sub>	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	57.3	80.3	75.9	95.4	92
L9	4	4		4.5	
L10	14	16.5		20.5	
L11	26.9	34.3	26.9	41.55	34.3
C1 <sup>2</sup>	46	70		90	70
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P
C3 <sup>2</sup>	≤8/≤11	≤14/≤19	≤8/≤11	≤19/≤24/≤28	≤14/≤19
C4 <sup>2</sup>	26.5	33.5	26.5	41	33.5
C5 <sup>2</sup> F <sub>6</sub>	30	50	30	70	50
C6 <sup>2</sup>	4	4	4	6	4
C7 <sup>2</sup>	42.6	60	42.6	92	60
C8 <sup>2</sup>	36.4	44.8	36.4	55.8	44.8
C9 <sup>2</sup>	119.7	161.1	148.3	196.2	181.8
B	5	5		6	
H	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 Triple Stage Dimensions



## Specifications

Unit:mm

Dimensions	PBE42	PBE60T	PBE90T
D1	50	70	100
D2	3.4	5.5	6.5
D3 <sub>h6</sub>	13	16	22
D4 <sub>g6</sub>	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 <sup>2</sup>	46	46	70
C2 <sup>2</sup>	M4x0.7P	M4x0.7P	M5x0.8P
C3 <sup>2</sup>	≤8/≤11	≤8/≤11	≤14/≤19
C4 <sup>2</sup>	26.5	26.5	33.5
C5 <sup>2</sup> <sub>F6</sub>	30	30	50
C6 <sup>2</sup>	4	4	4
C7 <sup>2</sup>	42.6	42.6	60
C8 <sup>2</sup>	36.4	36.4	44.8
C9 <sup>2</sup>	144.6	173.2	212.5
B	5	5	6
H	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.

★ L1=44 when gear ratio is 10.

## PBE Specifications Table

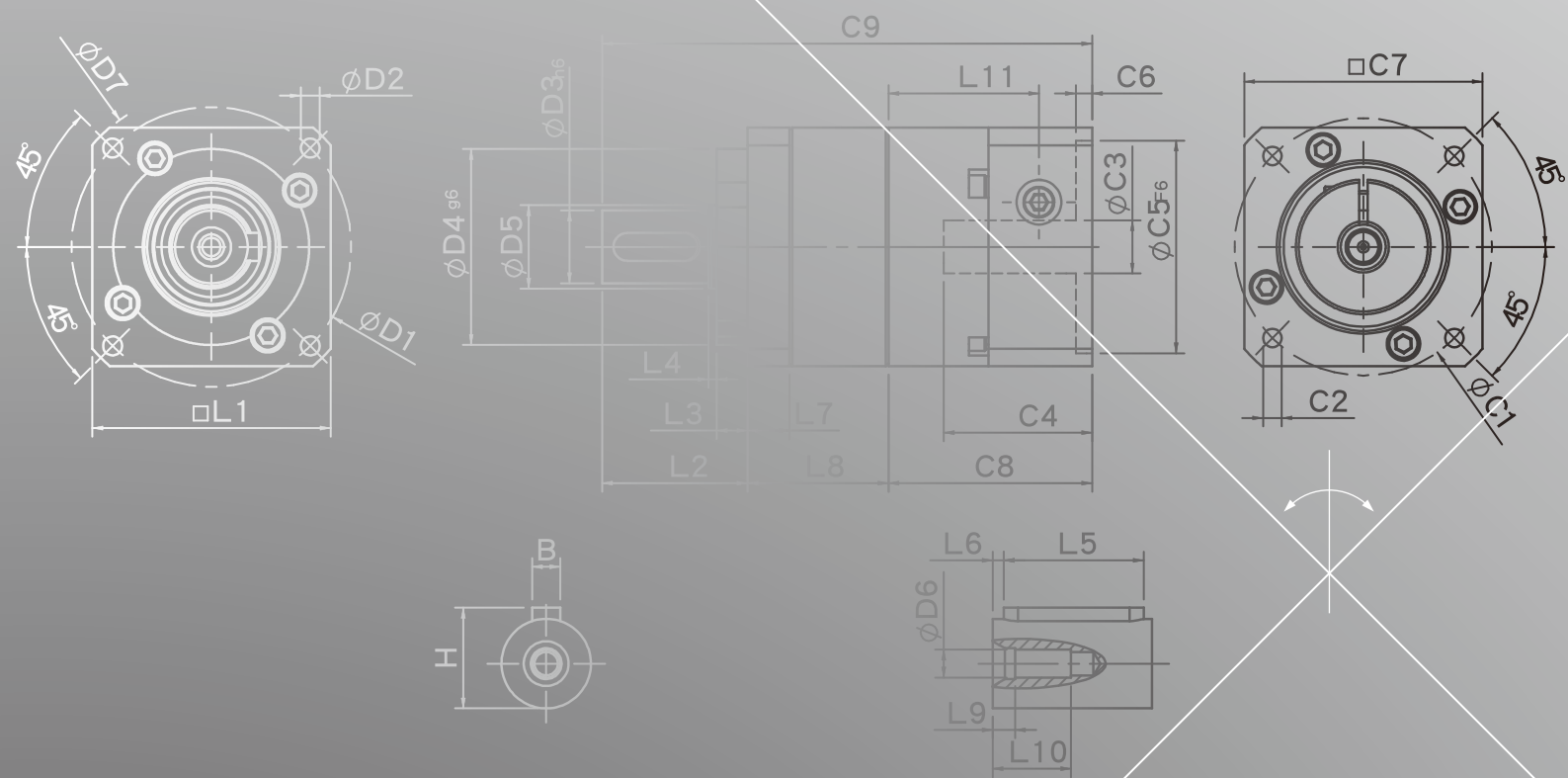
Specifications		Stage	Ratio	PBE-42	PBE-60	PBE-90		
Nominal Output Torque $T_{2N}$	N • m	1	3	4.8	13.6	33.5		
			4	6.3	21.6	58.6		
			5	6.0	20.5	55.1		
			7	5.6	19.2	51.8		
			9	5.4	18.5	50.0		
			10	5.4	17.0	48.0		
				Stage	Ratio	PBE-42	PBE-60(T)	PBE-90(T)
				2	15	4.8	13.6	33.5
					20	6.3	21.6	58.6
					25	6.0	20.5	55.1
					35	6.0	20.5	55.1
					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	PBE-42	PBE-60(T)	PBE-90(T)
				3	125	6.0	20.5	55.1
					175	6.0	20.5	55.1
					225	6.0	20.5	55.1
					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
		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 $n_{1N}$	rpm	1,2,3	3-729	4000	4000	3000
		Max. Input Speed $n_{1max}$	rpm	1,2,3	3-729	8000	6000	6000
		Backlash	arcmin	1	3-10	≤ 9	≤ 8	≤ 7
2	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		
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	3-10	≥ 95%				
		2	15-81	≥ 90%				
		3	125-729	≥ 85%				
Weight	kg	1	3-10	0.5	1.2	3.1		
		2	15-81	0.7	1.7/1.5	4.7/3.6		
		3	125-729	0.9	2.0/1.8	5.3/4.0		
Mounting Position	-	1,2,3	3-729	Any direction				
Noise Level <sup>2</sup>	dBA/1m	1,2,3	3-729	≤ 62	≤ 64	≤ 67		
Protection Class	-	1,2,3	3-729	IP64				
Lubrication	-	1,2,3	3-729	Synthetic Lubricant				

\* 1. Applied to the output shaft center @100rpm.

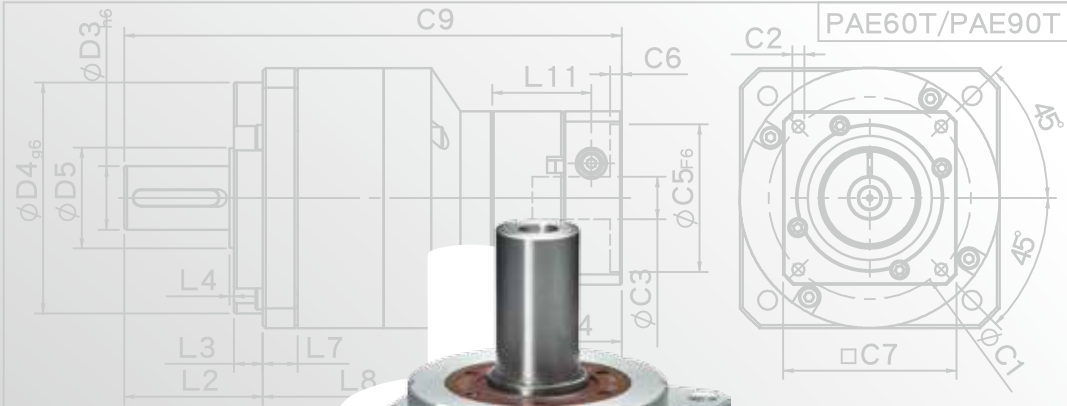
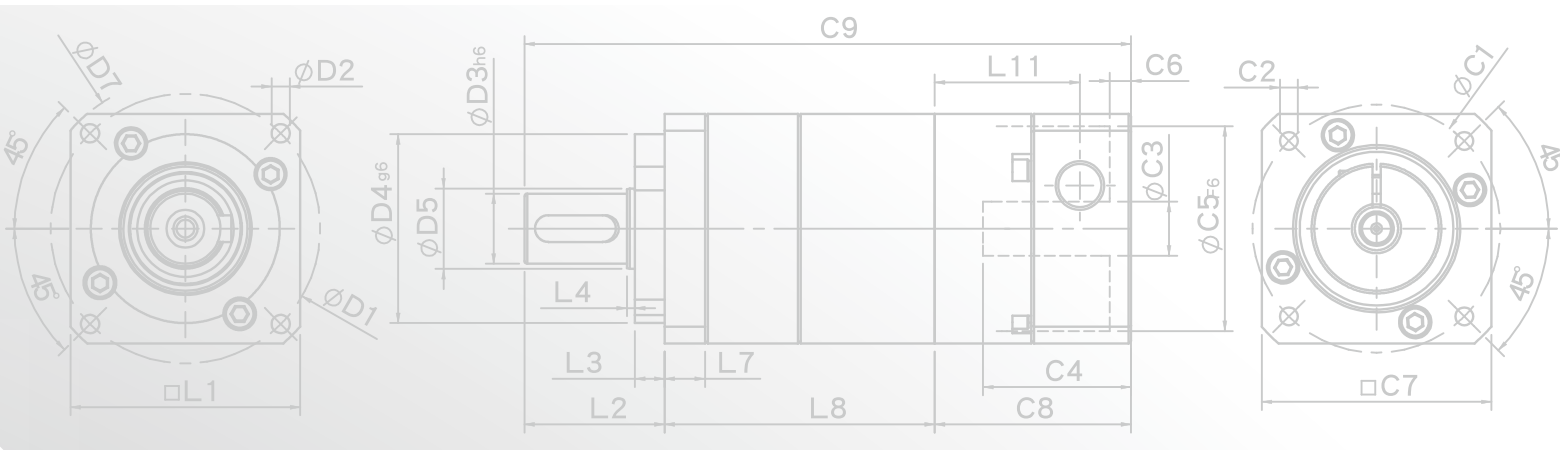
\* 2. Measured at 3000 rpm with no load. These values are measured by gearbox with ratio = 10 (1-stage) or ratio = 100 (2-stage) at nominal input speed or 3000 rpm (if nominal input speed is higher than 3000 rpm) with no load.

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

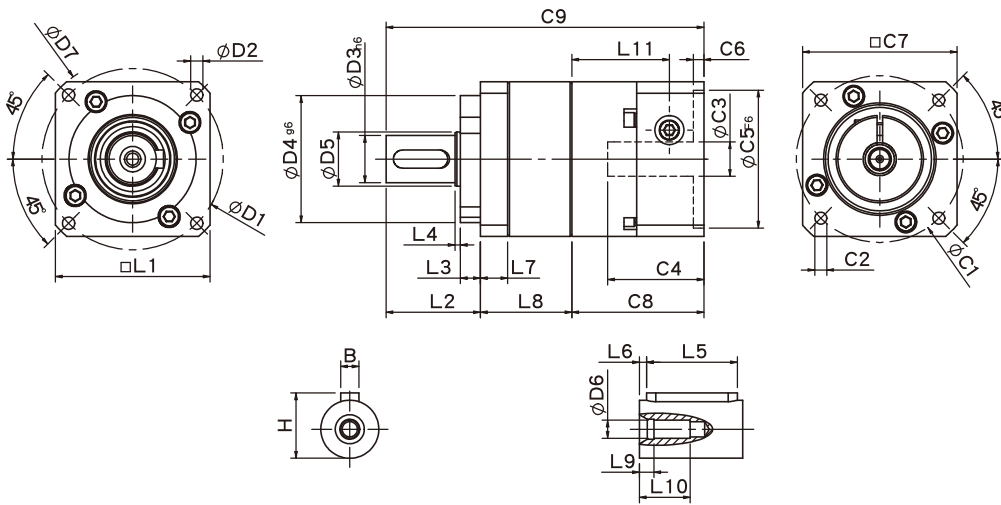
# PAE SERIES







## PAE Single Stage Dimensions



## Specifications

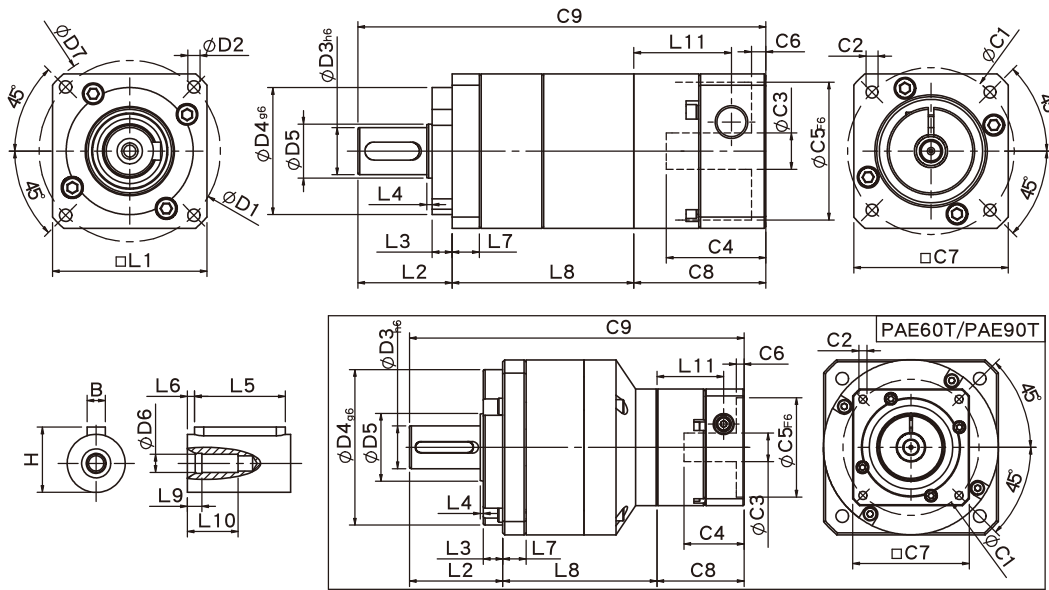
Unit:mm

Dimensions	PAE42	PAE60	PAE90	PAE115
D1	50	70	100	130
D2	3.4	5.5	6.5	9
D3 <sub>h6</sub>	13	16	22	32
D4 <sub>g6</sub>	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	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	7.5	10	12	16
L8	25.2	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 <sup>2</sup>	46	70	90	145
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P
C3 <sup>2</sup>	≤8/≤11	≤14/≤19	≤19/≤24/≤28	≤24/≤32/≤38
C4 <sup>2</sup>	26.5	33.5	41	51.5
C5 <sup>2</sup> <sub>F6</sub>	30	50	70	110
C6 <sup>2</sup>	4	4	6	6
C7 <sup>2</sup>	42.6	60	92	130
C8 <sup>2</sup>	36.4	44.8	55.8	68
C9 <sup>2</sup>	87.6	118.1	145.6	193.3
B	5	5	6	10
H	15	18	24.5	35

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

★ Specification subject to change without notice.

## PAE Double Stage Dimensions



## Specifications

Unit:mm

Dimensions	PAE42	PAE60/PAE60T		PAE90/PAE 90T		PAE115T
D1	50	70		100		-
D2	3.4	5.5		6.5		-
D3 <sub>h6</sub>	13	16		22		-
D4 <sub>g6</sub>	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	7.5	10		12		-
L8	50.1	67	62.6	82.8	79.4	-
L9	4	4		4.5		-
L10	14	16.5		20.5		-
L11	26.9	34.3	26.9	41.5	34.3	-
C1 <sup>2</sup>	46	70	46	90	70	-
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P	-
C3 <sup>2</sup>	≤8/≤11	≤14/≤19	≤8/≤11	≤19/≤24/≤28	≤14/≤19	-
C4 <sup>2</sup>	26.5	33.5	26.5	41	33.5	-
C5 <sup>2</sup> <sub>F6</sub>	30	50	30	70	50	-
C6 <sup>2</sup>	4	4	4	6	4	-
C7 <sup>2</sup>	42.6	60	42.6	92	60	-
C8 <sup>2</sup>	36.4	44.8	36.4	55.8	44.8	-
C9 <sup>2</sup>	112.5	148.8	136	186.6	172.2	-
B	5	5		6		-
H	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.

## PAE Specifications Table

Specifications		Stage	Ratio	PAE-42	PAE-60	PAE-90	PAE-115	
Nominal Output Torque $T_{2N}$	N • m	1	3	9	28	85	210	
			4	10	32	80	240	
			5	11	35	95	260	
			7	10	28	85	220	
			9	8	23	75	210	
		10	8	21	65	190		
		Stage	Ratio	PAE-42	PAE-60 PAE-60T	PAE-90 PAE-90T	PAE-115T	
		2	15	11	34	90	230	
			20	10	32	80	240	
			25	11	35	95	260	
			30	-	-	-	260	
			35	11	35	95	260	
			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 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 $n_{1N}$	rpm	1,2	3-100	4000	4000	3000	2500	
Max. Input Speed $n_{1max}$	rpm	1,2	3-100	8000	6000	6000	5000	
Standard Backlash P2	arcmin	1	3-10	≤ 9	≤ 8	≤ 7	≤ 6	
		2	15-100	≤ 12	≤ 10	≤ 9	≤ 8	
Torsional Rigidity	N • m /arcmin	1,2	3-100	1.5	4	8.5	17	
Max. Radial Load $F_{2rB}^1$	N	1,2	3-100	760	1250	2030	4200	
Max. Axial Load $F_{2aB}^1$	N	1,2	3-100	410	700	1200	2600	
Operating Temp.	°C		3-100	-10 °C ~ +90 °C				
Service Life	hr		3-100	20,000 (10,000/Continuous operation)				
Efficiency	%	1	3-10	≥ 95%				
		2	15-100	≥ 90%				
Weight	kg	1	3-10	0.6	1.3	3.2	7.5	
		2	15-100	0.8	1.8/1.6	4.8/3.7	9.2	
Mounting Position	-	1,2	3-100	Any direction				
Noise Level <sup>2</sup>	dB(A)/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		PAE-42 ( φ 8)	PAE-60 ( φ 14)	PAE-90 ( φ 19)	PAE-115 ( φ 24)	
1	3	Kg • cm <sup>2</sup>		0.04	0.23	0.77	2.30	
	4		0.03	0.21	0.67	1.92		
	5		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		PAE-42 ( φ 8)	PAE-60 ( φ 14) PAE-60T ( φ 8)	PAE-90 ( φ 19) PAE-90T ( φ 14)	PAE-115T ( φ 19)		
2	15/20/25		0.03	0.21(0.03)	0.61(0.21)	0.61		
	30/35/49		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 @100rpm.

\* 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.

# SERVO MOTOR GEARHEADS



PHL

PHFR

PHI

PGH

PUR

PUL

PGLH

PGL

PGC

PGE

PGRH

PCR

PGFR

PGF

PBC

PBE

**PAE**

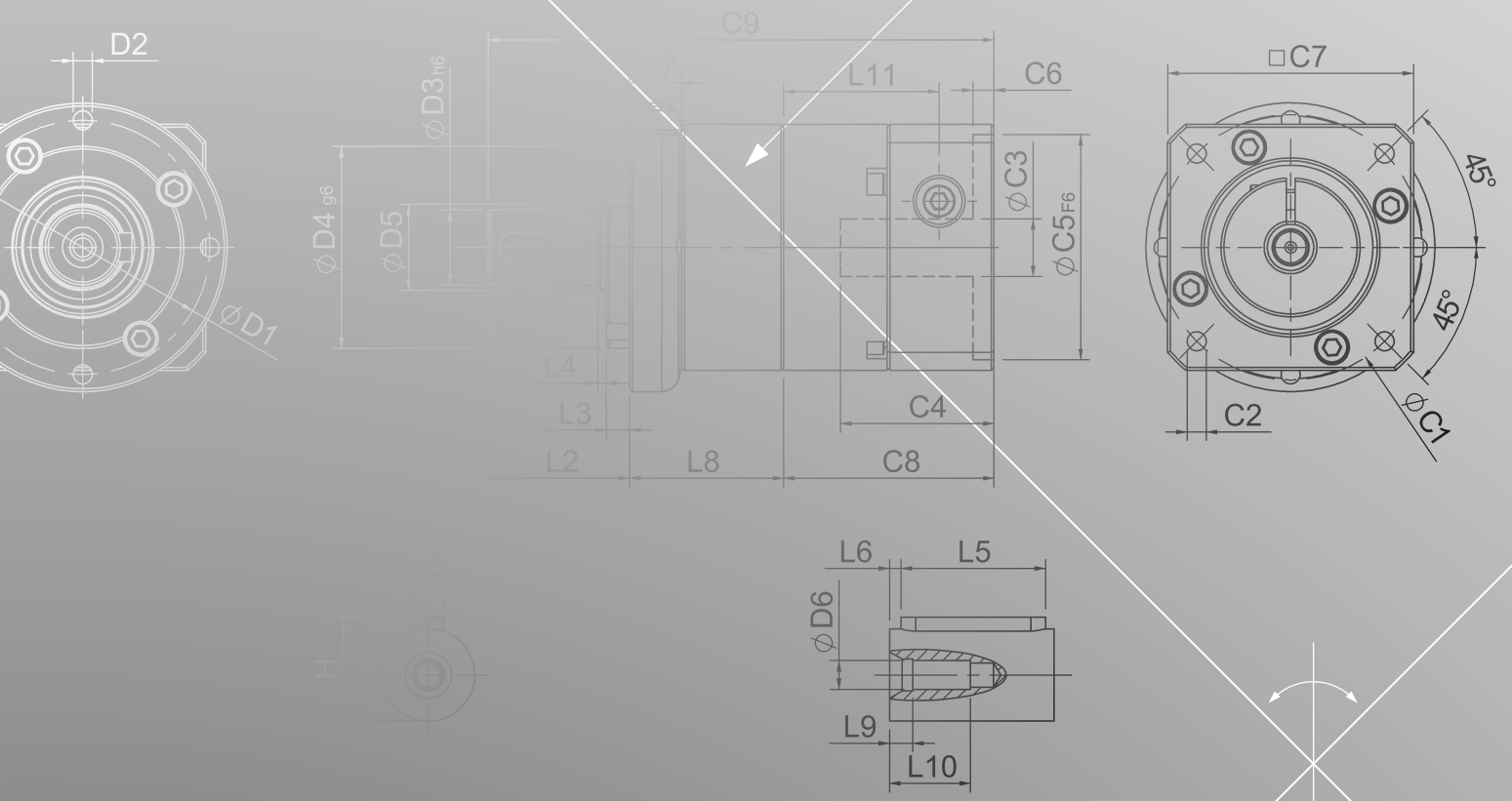
PAC

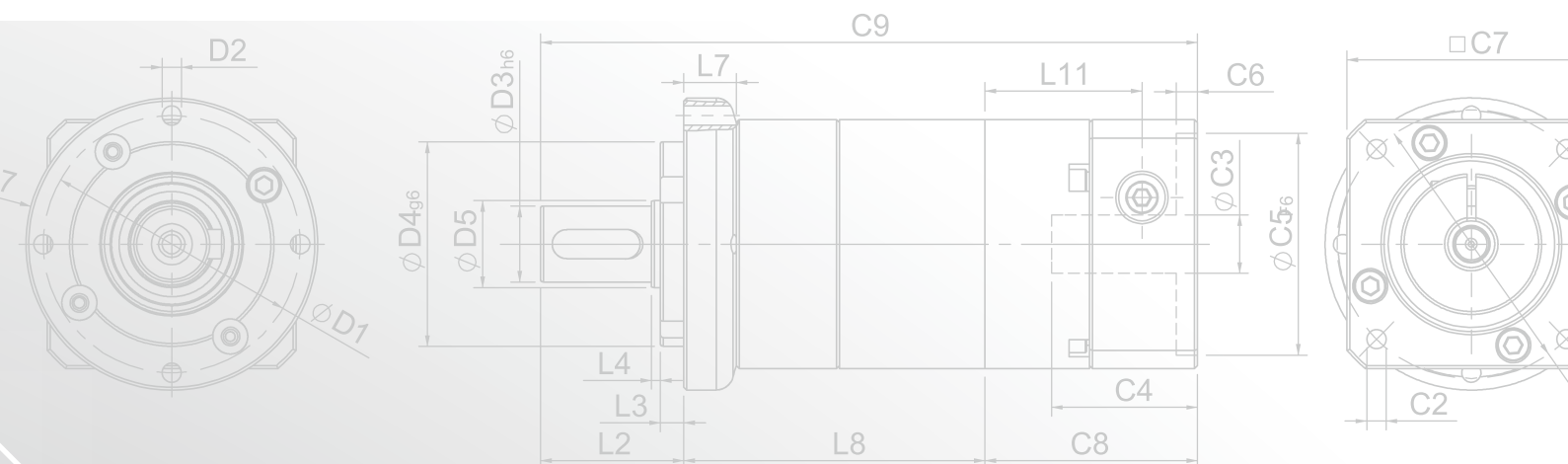
PAN

PGS

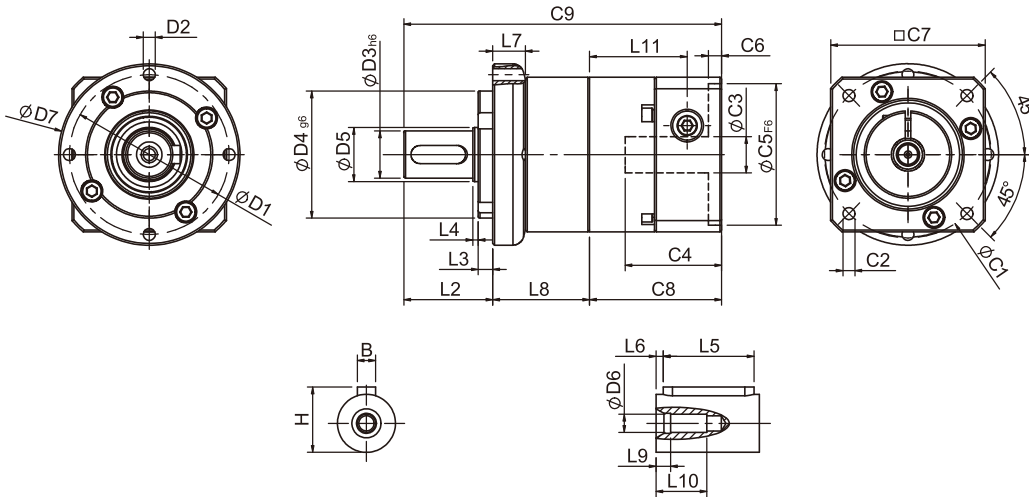
PNS

# ***PAC*** SERIES





## PAC Single Stage Dimensions



## Specifications

Unit:mm

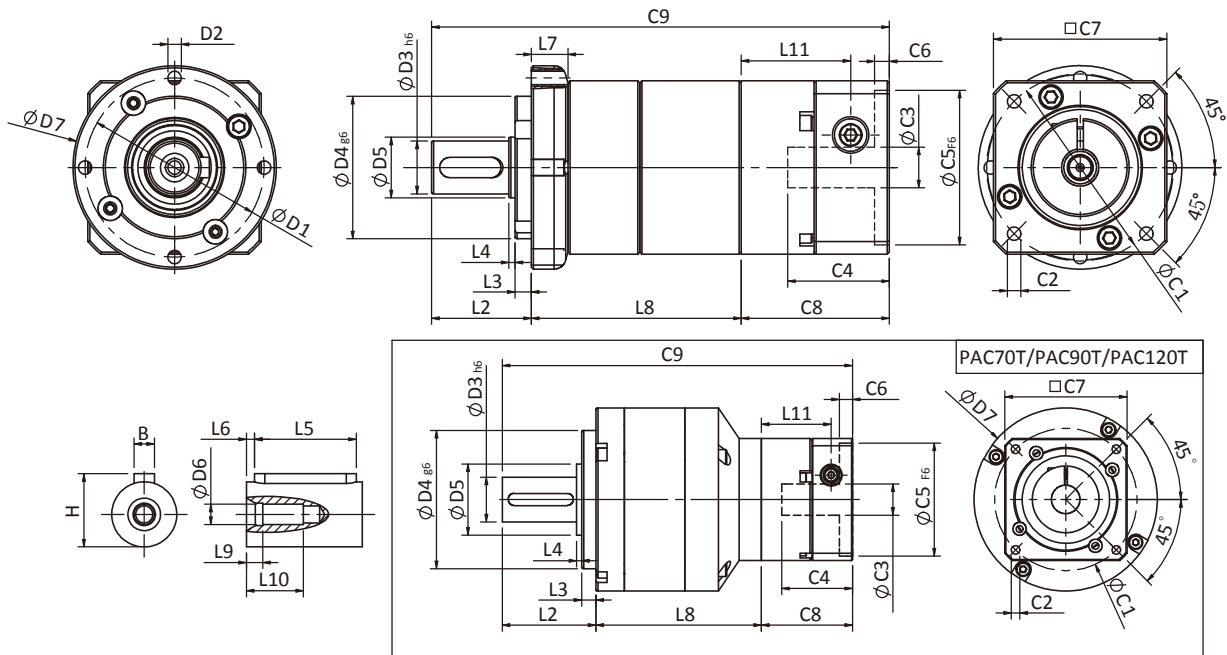
Dimensions	PAC50	PAC70	PAC90	PAC120
D1	44	62	80	108
D2	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P
D3 <sub>h6</sub>	12	16	22	32
D4 <sub>g6</sub>	35	52	68	90
D5	15	20	35	45
D6	M4x0.7P	M5x0.8P	M8x1.25P	M12x1.75P
D7	50	70	90	120
L2	24.5	36	46	60
L3	4	6	7	7
L4	1.5	1.5	2.5	2
L5	15	25	32	40
L6	2	2	3	5
L7	9	13.3	14	15
L8	26.7	37.3	43.8	65.3
L9	4	4	4.5	6
L10	14	16.5	20.5	30
L11	26.9	34.3	41.5	51.5
C1 <sup>2</sup>	46	70	90	145
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P
C3 <sup>2</sup>	≤8/≤11	≤14/≤19	≤19/≤24/≤28	≤24/≤32/≤38
C4 <sup>2</sup>	26.5	33.5	41	51.5
C5 <sup>2</sup> <sub>F6</sub>	30	50	70	40
C6 <sup>2</sup>	4	4	6	6
C7 <sup>2</sup>	42.6	60	90	130
C8 <sup>2</sup>	36.4	44.8	55.8	68
C9 <sup>2</sup>	87.6	118.1	145.6	193.3
B	4	5	6	10
H	13.5	18	24.5	35

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

★ Specification subject to change without notice.



## PAC Double Stage Dimensions



## Specifications

Unit:mm

Dimensions	PAC50	PAC70	PAC70T	PAC90	PAC90T	PAC120T
D1	44	62		80		108
D2	M4x0.7P	M5x0.8P		M6x1.0P		M8x1.25P
D3 <sub>h6</sub>	12	16		22		32
D4 <sub>g6</sub>	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	9	13.3		14		15
L8	51.6	68	63.6	84.8	81.4	103.4
L9	4	4		4.5		6
L10	14	16.5		20.5		30
L11	26.9	34.3	26.9	41.5	34.3	41.5
C1 <sup>2</sup>	46	70		90		90
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P	M8x1.25P
C3 <sup>2</sup>	≤8/≤11	≤14/≤19	≤8/≤11	≤19/≤24/≤28	≤14/≤19	≤19/≤24/≤28
C4 <sup>2</sup>	26.5	33.5	26.5	41	33.5	41
C5 <sup>2</sup> <sub>F6</sub>	30	50	30	70	50	70
C6 <sup>2</sup>	4	4	4	6	4	6
C7 <sup>2</sup>	42.6	60	42.6	90	60	90
C8 <sup>2</sup>	36.4	44.8	36.4	55.8	44.8	55.8
C9 <sup>2</sup>	112.5	148.8	136	186.6	172.2	219.2
B	4	5		6		10
H	13.5	18		24.5		35

\* C1~C9 are motor specific dimensions(metric std shown ), Size may vary according to motor flange.

\* Specification subject to change without notice.

## PAC Specifications Table

Specifications		Stage	Ratio	PAC-50	PAC-70	PAC-90	PAC-120		
Nominal Output Torque $T_{2N}$	N • m	1	3	9	28	85	210		
			4	10	32	80	240		
			5	11	35	95	260		
			7	10	28	85	220		
			9	8	23	75	210		
		10	8	21	65	190			
				Stage	Ratio	PAC-50	PAC-70 PAC-70T	PAC-90 PAC-90T	PAC-120T
				2	15	11	34	90	230
					20	10	32	80	240
					25	11	35	95	260
					30	-	-	-	260
					35	11	35	95	260
					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 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 $n_{1N}$	rpm	1,2	3-100	4000	4000	3000	2500		
Max. Input Speed $n_{1max}$	rpm	1,2	3-100	8000	6000	6000	5000		
Standard Backlash P2	arcmin	1	3-10	≤ 9	≤ 8	≤ 7	≤ 6		
		2	15-100	≤ 12	≤ 10	≤ 9	≤ 8		
Torsional Rigidity	N • m / arcmin	1,2	3-100	1.5	4	8.5	17		
Max. Radial Load $F_{2rB}^1$	N	1,2	3-100	760	1250	2030	4200		
Max. Axial Load $F_{2aB}^1$	N	1,2	3-100	410	700	1200	2600		
Operating Temp.	°C		3-100	-10 °C ~ +90 °C					
Service Life	hr		3-100	20,000 (10,000/Continuous operation)					
Efficiency	%	1	3-10	≥ 95%					
		2	15-100	≥ 90%					
Weight	kg	1	3-10	0.6	1.3	3.2	7.5		
		2	15-100	0.8	1.8/1.6	4.8/3.7	9.2		
Mounting Position	-	1,2	3-100	Any direction					
Noise Level <sup>2</sup>	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		PAC-50 ( φ 8 )	PAC-70 ( φ 14 )	PAC-90 ( φ 19 )	PAC-120 ( φ 24 )		
1	3	Kg • cm <sup>2</sup>		0.04	0.23	0.77	2.30		
	4			0.03	0.21	0.67	1.92		
	5			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			PAC-50 ( φ 8 )	PAC-70 ( φ 14 ) PAC-70T ( φ 8 )	PAC-90 ( φ 19 ) PAC-90T ( φ 14 )	PAC-120 ( φ 19 )		
2	15/20/25			0.03	0.21(0.03)	0.61(0.21)	0.61		
	30/35/49			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 @100rpm.

\* 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.

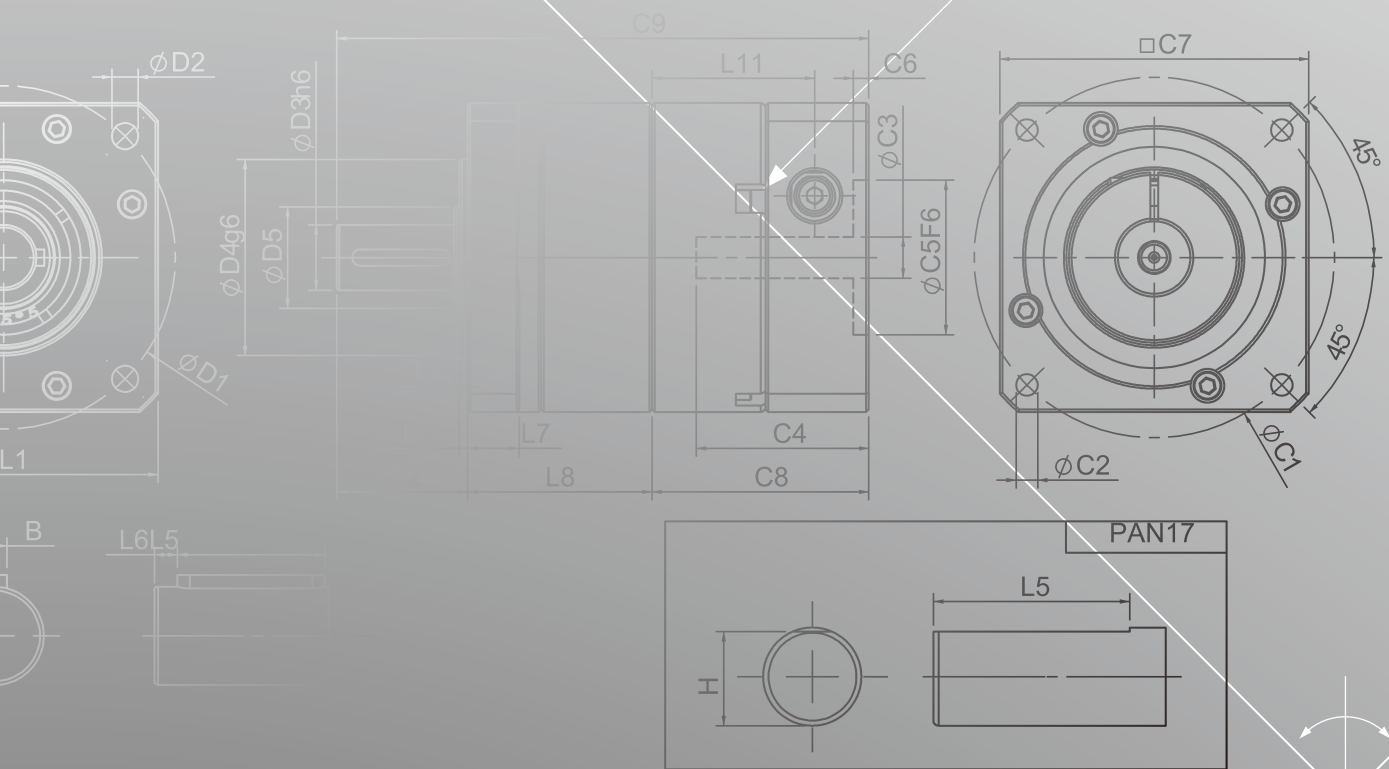
Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

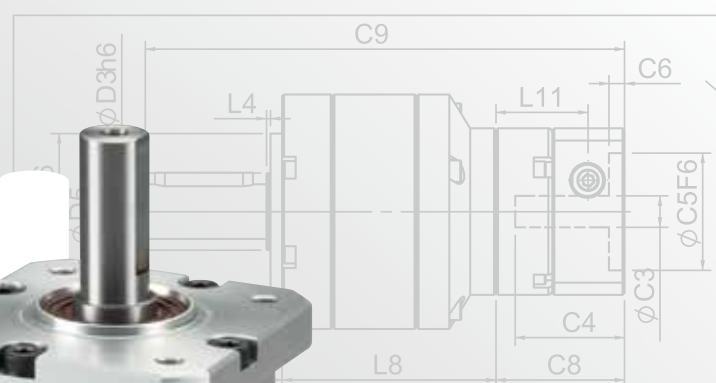
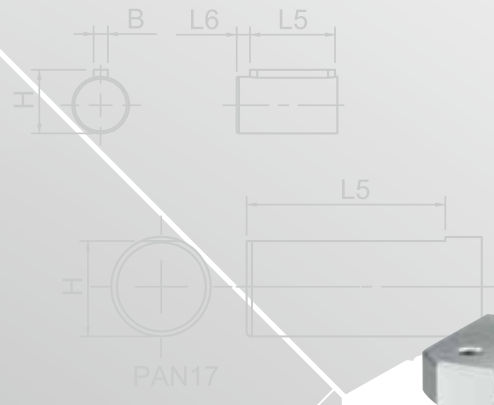
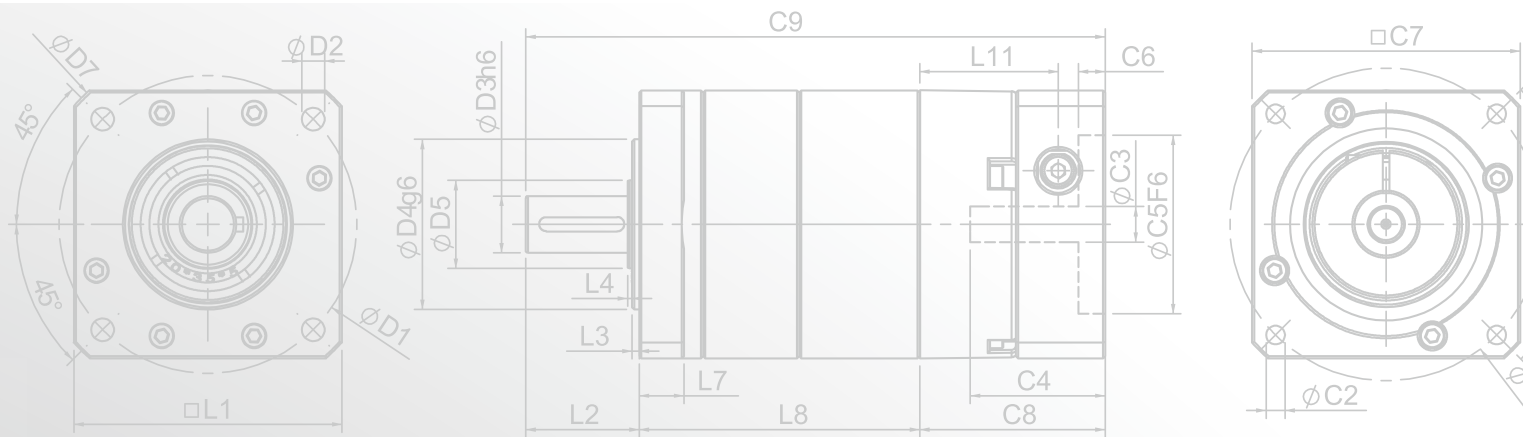
# SERVO MOTOR GEARHEADS



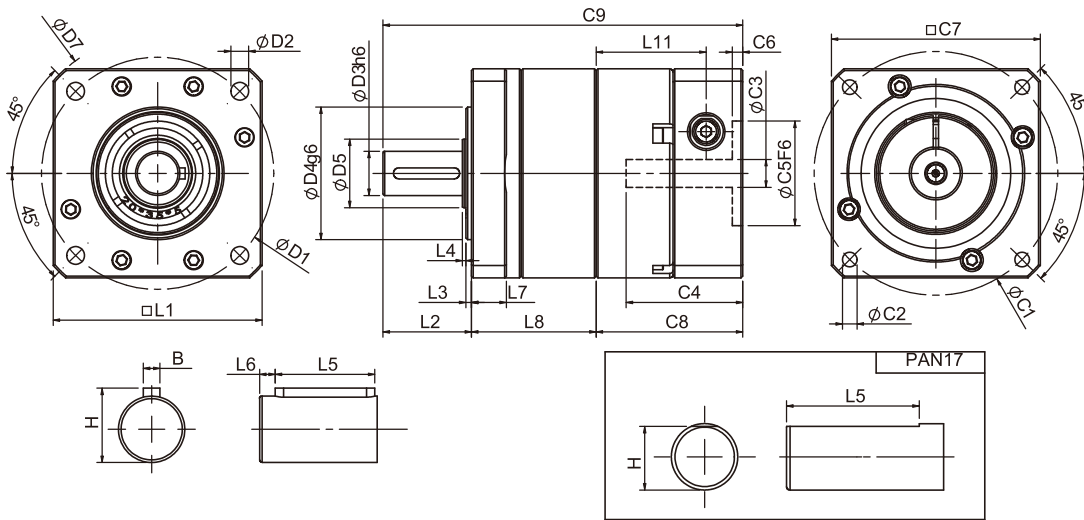
- PHL
- PHFR
- PHF
- PGH
- PUR
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- PGLH
- PGL
- PGC
- PGE
- PGRH
- PGR
- PGFR
- PGF
- PBC
- PBE
- PAE
- PAC**
- PAN
- PGS
- PNS

# ***PAN** SERIES*





## PAN Single Stage Dimensions



## Specifications

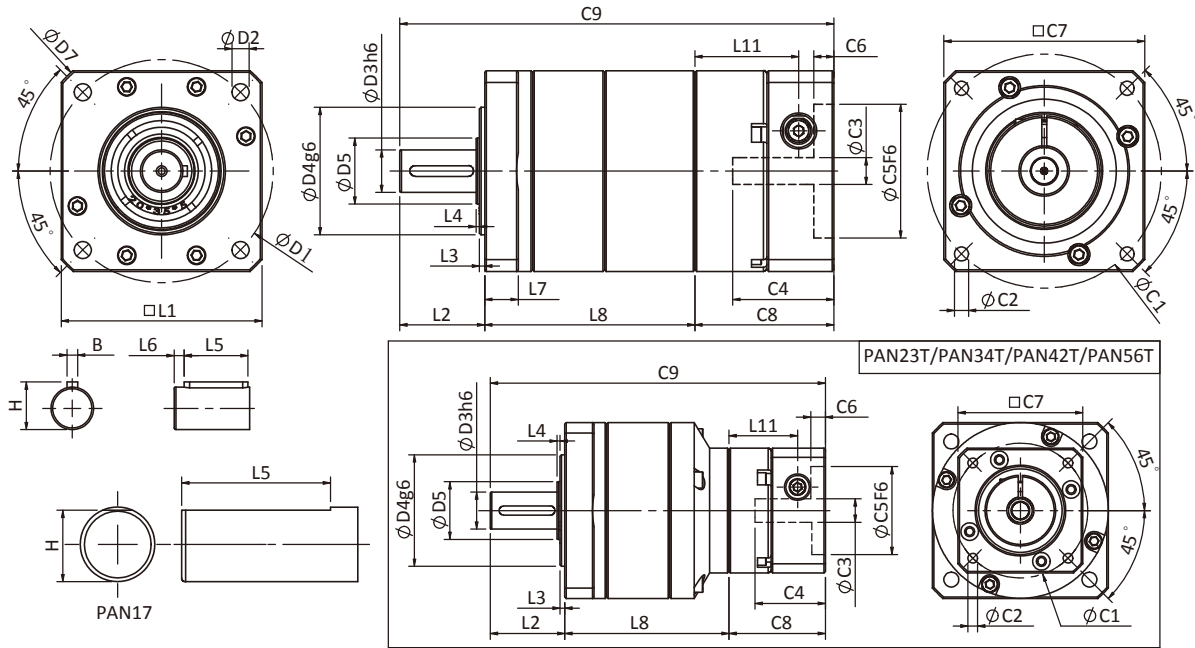
Unit:mm

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
D3 <sub>h6</sub>	9.525	12.7	19.05	25	25
D4 <sub>g6</sub>	21.97	38.1	73.025	55.55	114.3
D5	12	20	35	32	-
D7	56	80	118	148	195
L1	44(42.6)	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	37.25	51.8	51.8
C1 <sup>2</sup>	46	70	90	145	145
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P
C3 <sup>2</sup>	≤8/≤11	≤14/≤19	≤19/≤24/≤28	≤24/≤32/≤38	≤24/≤32/≤38
C4 <sup>2</sup>	26.5	33.5	41	51.5	51.5
C5 <sup>2</sup> <sub>F6</sub>	30	50	70	110	110
C6 <sup>2</sup>	4	4	6	6	6
C7 <sup>2</sup>	42.6	60	90	130	130
C8 <sup>2</sup>	36.4	42.1	51.5	68	68
C9 <sup>2</sup>	90.6	103.3	126.75	177.4	177.4
B	-	3.175	4.763	8	8
H	9.14	14.22	21.25	28	28

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

★ Specification subject to change without notice.

## PAN Double Stage Dimensions



## Specifications

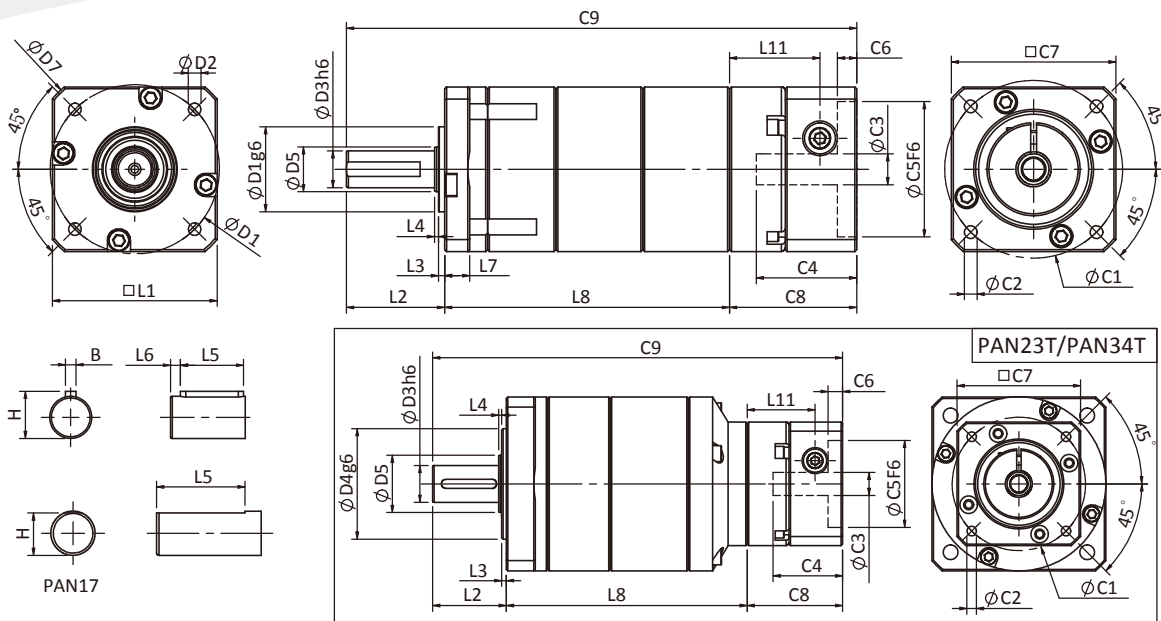
Unit:mm

Dimensions	PAN17	PAN23	PAN23T	PAN34	PAN34T	PAN42T	PAN56T
D1	43.8	66.67		98.425		125.7	177.8
D2	3.25	5.1		5.6		7.1	10.2
D3 <sub>h6</sub>	9.525	12.7		19.05		25	25
D4 <sub>g6</sub>	21.97	38.1		73.025		55.55	114.3
D5	12	20		35		32	-
D7	56	80		118		148	195
L1	44(42.6)	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	51.25	62.8	56.1	77.3	72.8	105.5	106.5
L11	23.4	31	23.4	37.25	31	37.3	37.3
C1 <sup>2</sup>	46	70	46	90	70	90	90
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P	M6x1.0P	M6x1.0P
C3 <sup>2</sup>	≤8/≤11	≤14/≤19	≤8/≤11	≤19/≤24/≤28	≤14/≤19	≤19/≤24/≤28	≤19/≤24/≤28
C4 <sup>2</sup>	26.5	33.5	26.5	41	33.5	41	41
C5 <sup>2</sup> <sub>F6</sub>	30	50	30	70	50	70	70
C6 <sup>2</sup>	4	4	4	6	4	6	6
C7 <sup>2</sup>	42.6	60	42.6	90	60	90	90
C8 <sup>2</sup>	32.9	41.5	32.9	51.5	41.5	51.5	51.5
C9 <sup>2</sup>	109.55	129.7	114.4	160.55	146.05	199	19
B	-	3.175		4.763		8	8
H	9.14	14.22		21.25		28	28

\* C1~C9 are motor specific dimensions(metric std shown ), Size may vary according to motor flange.

\* 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
D3 <sub>h6</sub>	9.525	12.7	19.05
D4 <sub>g6</sub>	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 <sup>2</sup>	46	46	70
C2 <sup>2</sup>	M4x0.7P	M4x0.7P	M5x0.8P
C3 <sup>2</sup>	≤8/≤11	≤8/≤11	≤14/≤19
C4 <sup>2</sup>	26.5	26.5	33.5
C5 <sup>2</sup> <sub>F6</sub>	30	30	50
C6 <sup>2</sup>	4	4	4
C7 <sup>2</sup>	42.6	42.6	60
C8 <sup>2</sup>	32.9	32.9	41.5
C9 <sup>2</sup>	132	141.4	179.85
B	-	3.175	4.763
H	9.14	14.1	21.1

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

★ Specification subject to change without notice.

★ L1=44 when gear ratio is 10.



## PAN Specifications Table

Specifications	Stage	Ratio	PAN-17	PAN-23	PAN-34	PAN-42	PAN-56		
Nominal Output Torque $T_{2N}$	1	3	9	28	85	200	200		
		4	10	32	80	215	215		
		5	11	35	95	215	215		
		7	10	28	85	200	200		
		9	8	23	75	195	195		
		10	8	21	65	180	180		
	2	Stage	Ratio	PAN-17	PAN-23 / PAN-23T	PAN-34 / PAN-34T	PAN-42T	PAN-56T	
		15	11	35/24	95/68	168	168		
		20	11	35/31	95/95	215	215		
		25	11	35/30	95/95	215	215		
		35	11	35/28	95/95	215	215		
		45	11	35/27	95/92	215	215		
		50	(Ratio 49): 10	35/27	95/82	205	205		
		70	(Ratio 63): 10	28/28	85/85	200	200		
		90	(Ratio 81): 8	23/23	75/75	195	195		
		100	8	21/21	65/65	180	180		
		3	Stage	Ratio	PAN-17	PAN-23T	PAN-34T	PAN-42T	PAN-56T
			125	11	35	95	215	215	
	175		11	35	95	215	215		
	225		11	35	95	215	215		
	245		11	35	95	215	215		
	315		11	35	95	215	215		
	405		11	35	95	215	215		
	567		10	28	85	200	200		
	729		8	23	75	195	195		
	1000		8	21	65	180	180		
	Emergency Stop Torque $T_{2NOT}$	N • m	2.5 times of Nominal Output Torque (* Max. Output Torque $T_{2B}$ =60% of Emergency Stop Torque)						
	Nominal Input Speed $n_{1N}$	rpm	1,2,3	3-1000	4000	4000	3000	2500	2500
Max. Input Speed $n_{1max}$	rpm	1,2,3	3-1000	6000	6000	6000	5000	5000	
Standard Backlash $P_2$	arcmin	1	3-10	≤ 9	≤ 8	≤ 7	≤ 6	≤ 6	
		2	15-100	≤ 12	≤ 10	≤ 9	≤ 8	≤ 8	
		3	125~1000	≤ 15	≤ 12	≤ 12	≤ 12	≤ 12	
Torsional Rigidity	N • m / arcmin	1,2,3	3-1000	1.2	3.5	8.5	17	17	
Max. Radial Load $F_{2rB}^{-1}$	N	1,2,3	3-1000	580	960	2160	4760	4760	
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	-10°C ~ +90°C					
Service Life	hr	1,2,3	3-1000	20,000(10,000 / Continuous operation)					
Efficiency	%	1	3-10	≥ 95%					
		2	15-100	≥ 90%					
		3	125~1000	≥ 85%					
Weight	kg	1	3-10	0.5	1.1	2.8	6.3	6.6	
		2	15-100	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 <sup>2</sup>	dBA/1m	1,2,3	3-1000	60	63	66	67	67	
Protection Class	-	1,2,3	3-1000	IP 65					
Lubrication	-	1,2,3	3-1000	Synthetic Lubricant					
Inertia (J1)									
Stage	Ratio	unit	PAN-17(ψ8)	PAN-23(ψ14)	PAN-34(ψ19)	PAN-42(ψ24)	PAN-56(ψ24)		
1	3	Kg • cm <sup>2</sup>	0.04	0.23	0.77	2.30	2.30		
	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		PAN-17(ψ8)	PAN-23(ψ14) / PAN-23T(ψ8)	PAN-34(ψ19) / PAN-34T(ψ14)	PAN-42T(ψ19)	PAN-56T(ψ19)		
2	15		0.04	0.23(0.04)	0.77(0.23)	0.77	0.77		
	Other ratios		0.03	0.21(0.03)	0.61(0.21)	0.61	0.61		
Stage	Ratio		PAN-17(ψ8)	PAN-23T(ψ8)	PAN-34T(ψ14)	PAN-42T(ψ19)	PAN-56T(ψ19)		
3	All ratios		0.03	0.03	0.21	0.61	0.61		

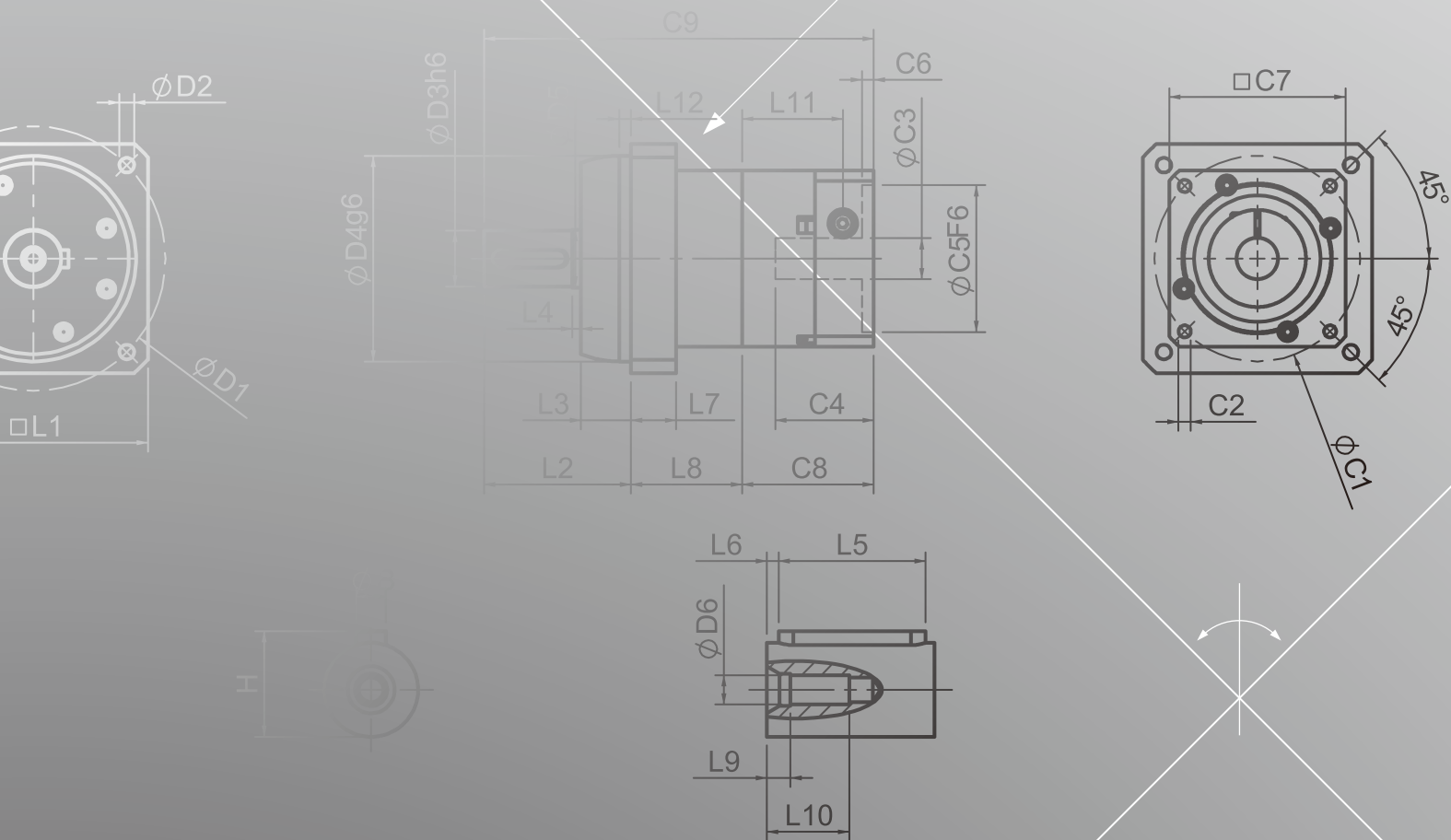
\* 1. Applied to the output shaft center @100rpm.

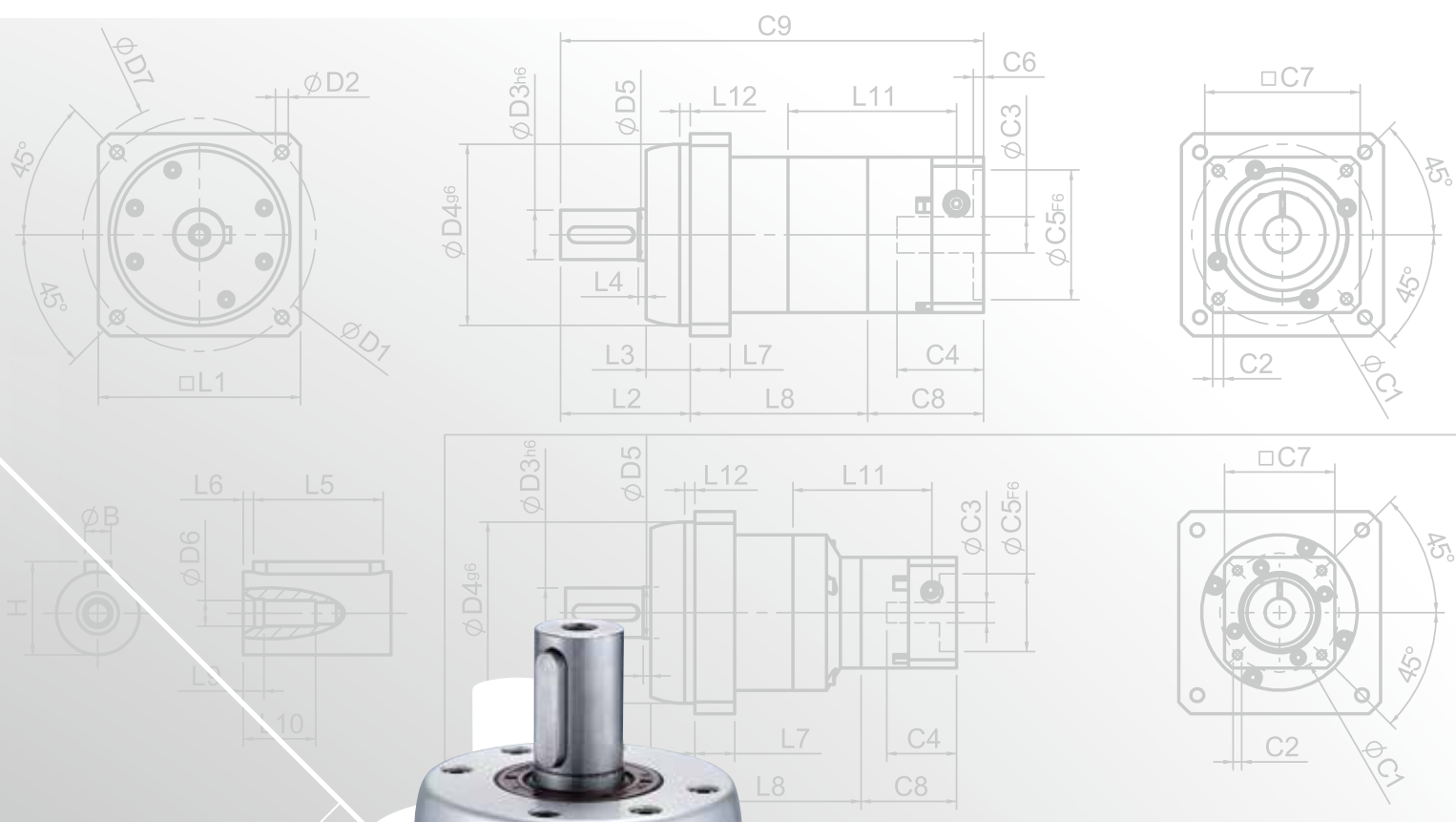
\* 2. Measured at 3000 rpm with no load. These values are measured by gearbox with ratio = 10 (1-stage) or ratio = 100 (2-stage) at nominal input speed or 3000 rpm (if nominal input speed is higher than 3000 rpm) with no load.

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

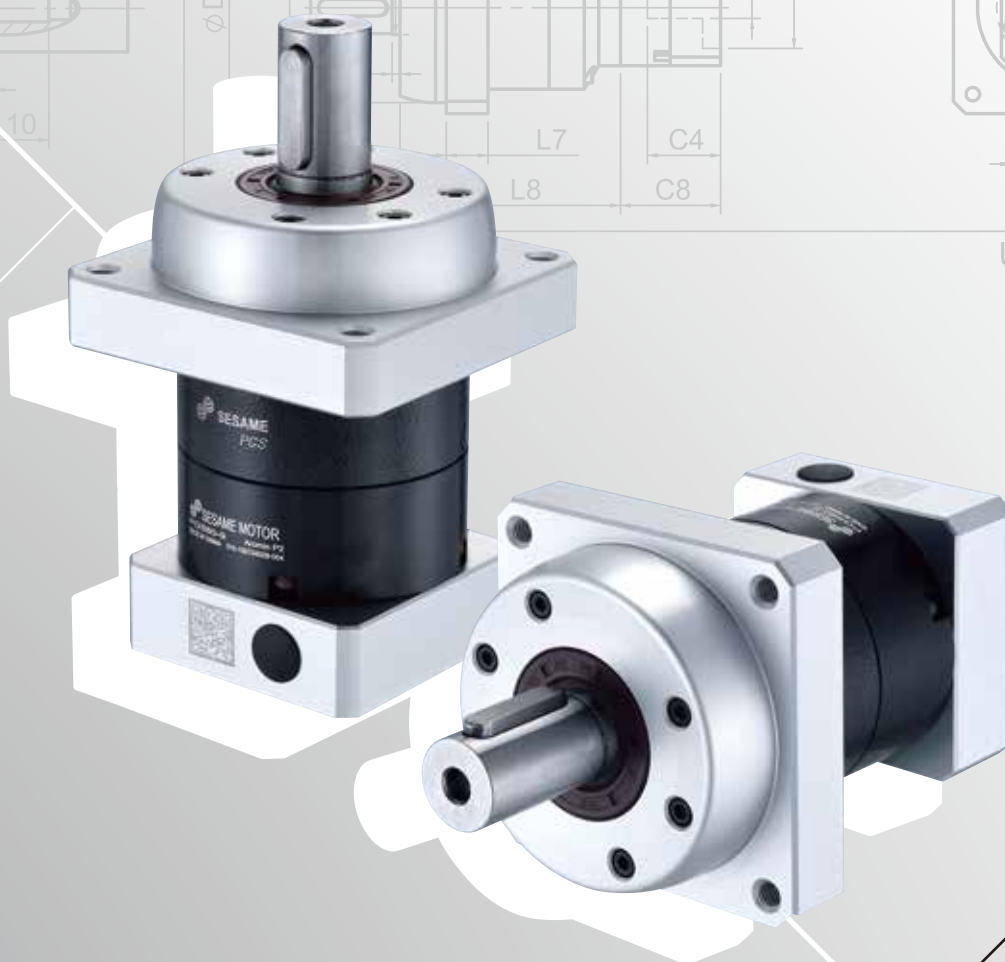
Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

# PGS SERIES

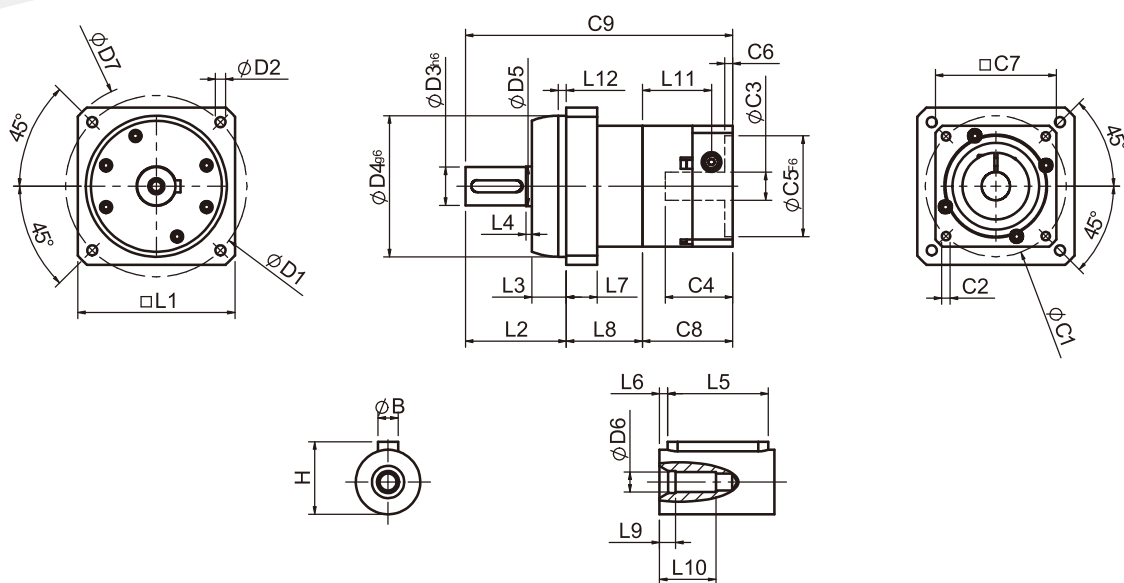




Unit:mm



## PGS Single Stage Dimensions



## Specifications

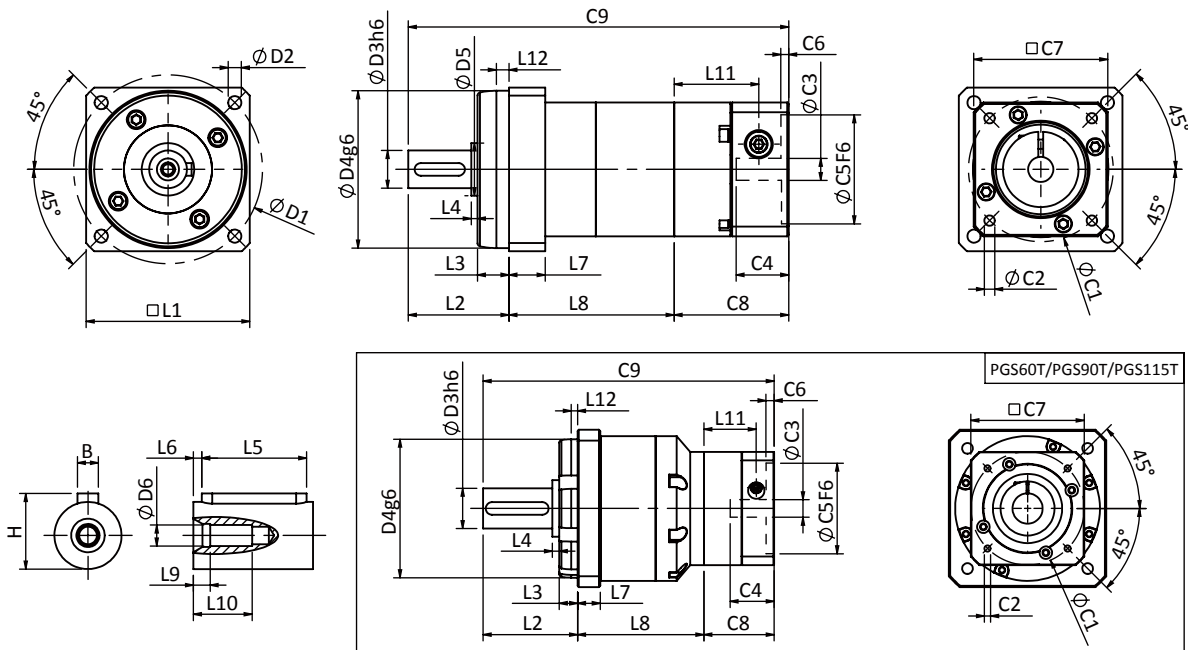
Unit:mm

Dimensions	PGS42	PGS60	PGS90	PGS115
D1	60	90	115	135
D2	M5x0.8P	M6x1.0P	M8x1.25P	M10x1.5P
D3 <sub>h6</sub>	12	19	24	32
D4 <sub>g6</sub>	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 <sup>2</sup>	46	70	90	145
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P
C3 <sup>2</sup>	$\leq 8 / \leq 11$	$\leq 14 / \leq 19$	$\leq 19 / \leq 24 / \leq 28$	$\leq 24 / \leq 32 / \leq 38$
C4 <sup>2</sup>	26.5	33.5	41	51.5
C5 <sup>2</sup> <sub>F6</sub>	30	50	70	110
C6 <sup>2</sup>	4	4	6	6
C7 <sup>2</sup>	42.6	60	90	130
C8 <sup>2</sup>	36.4	44.8	55.8	68
C9 <sup>2</sup>	96	132.6	163	205.3
B	4	6	8	10
H	13.5	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.

## PGS Double Stage Dimensions



## Specifications

Unit:mm

Dimensions	PGS42	PGS60	PGS60T	PGS90	PGS90T	PGS115T
D1	60	90		115		135
D2	M5x0.8P	M6x1.0P		M8x1.25P		M10x1.5P
D3 <sub>h6</sub>	12	19		24		32
D4 <sub>g6</sub>	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	52.5	68.5	64.1	87.2	83.8	100.4
L9	4	4		4.5		6
L10	14	16.5		20.5		30
L11	51.8	34.3	26.9	41.55	34.3	41.55
L12	3	4		5		5
C1 <sup>2</sup>	46	70	46	90	70	90
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P	M6x1.0P
C3 <sup>2</sup>	≤8/≤11	≤14/≤19	≤8/≤11	≤19/≤24/≤28	≤14/≤19	≤19/≤24/≤28
C4 <sup>2</sup>	26.5	33.5	26.5	41	33.5	41
C5 <sup>2</sup> <sub>F6</sub>	30	50	30	70	50	70
C6 <sup>2</sup>	4	4	4	6	4	6
C7 <sup>2</sup>	42.6	60	42.6	90	60	90
C8 <sup>2</sup>	36.4	44.8	36.4	55.8	44.8	55.8
C9 <sup>2</sup>	120.9	163.3	150.5	204	189.6	231.2
B	4	6		8		10
H	13.5	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.

## PGS Specifications Table

Specifications		Stage	Ratio	PGS-42	PGS-60	PGS-90	PGS-115	
Nominal Output Torque $T_{2N}$	N • m	1	3	9	28	85	250	
			4	10	32	80	230	
			5	11	35	95	255	
			7	10	28	85	210	
			9	8	23	75	180	
			10	8	21	65	190	
		Stage	Ratio	PGS-42	PGS-60/ PGS-60T	PGS-90/ PGS-90T	PGS-115T	
		2	15	11	34	90	250	
			20	10	32	80	230	
			25	11	35	95	255	
			35	11	35	95	255	
			45	11	35	95	255	
			49	10	28	85	210	
			63	10	28	85	210	
81	8		23	75	180			
100	8	21	65	190				
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 $n_{1N}$	rpm	1,2	3-100	4000	4000	3000	2500	
Max. Input Speed $n_{1max}$	rpm	1,2	3-100	8000	6000	6000	5000	
Standard Backlash P2	arcmin	1	3-10	$\leq 9$	$\leq 8$	$\leq 7$	$\leq 6$	
		2	15-100	$\leq 12$	$\leq 10$	$\leq 9$	$\leq 8$	
Torsional Rigidity	N • m /arcmin	1,2	3-100	1.5	4.0	8.5	17	
Max. Radial Load $F_{2rB}^{-1}$	N	1,2	3-100	1120	1720	2800	4600	
Max. Axial Load $F_{2aB}^{-1}$	N	1,2	3-100	520	830	1730	2950	
Operating Temp.	°C	-10 °C ~ +90 °C						
Service Life	hr	3-100 20,000 (10,000/ Continuous operation)						
Efficiency	%	1	3-10	$\geq 95\%$				
		2	15-100	$\geq 90\%$				
Weight	kg	1	3-10	0.6	1.5	3.4	7.8	
		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 <sup>2</sup>	dB(A)/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		PGS-42( $\psi$ 8)	PGS-60( $\psi$ 14)	PGS-90( $\psi$ 19)	PGS-115( $\psi$ 24)	
1	3	Kg • cm <sup>2</sup>		0.04	0.23	0.77	2.30	
	4			0.03	0.21	0.67	1.92	
	5			0.03	0.21	0.61	1.71	
	7			0.03	0.21	0.60	1.65	
	9			0.03	0.21	0.60	1.63	
Stage	Ratio			PGS-42( $\psi$ 8)	PGS-60( $\psi$ 14)/ PGS-60T( $\psi$ 8)	PGS-90( $\psi$ 19)/ PGS-90T( $\psi$ 14)	PGS-115T( $\psi$ 19)	
2	15/20/25			0.03	0.21(0.03)	0.61(0.21)	0.61	
	35/49			0.03	0.21(0.03)	0.60(0.21)	0.60	
	45/63/81			0.03	0.21(0.03)	0.60(0.21)	0.60	

\* 1. Applied to the output shaft center @100rpm.  
\* 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.

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# SERVO MOTOR GEARHEADS



PHL

PHFR

PHF

PGH

PUR

PUL

PGLH

PGL

PGC

PGE

PGRH

PCR

PGFR

PGF

PBC

PBE

PAE

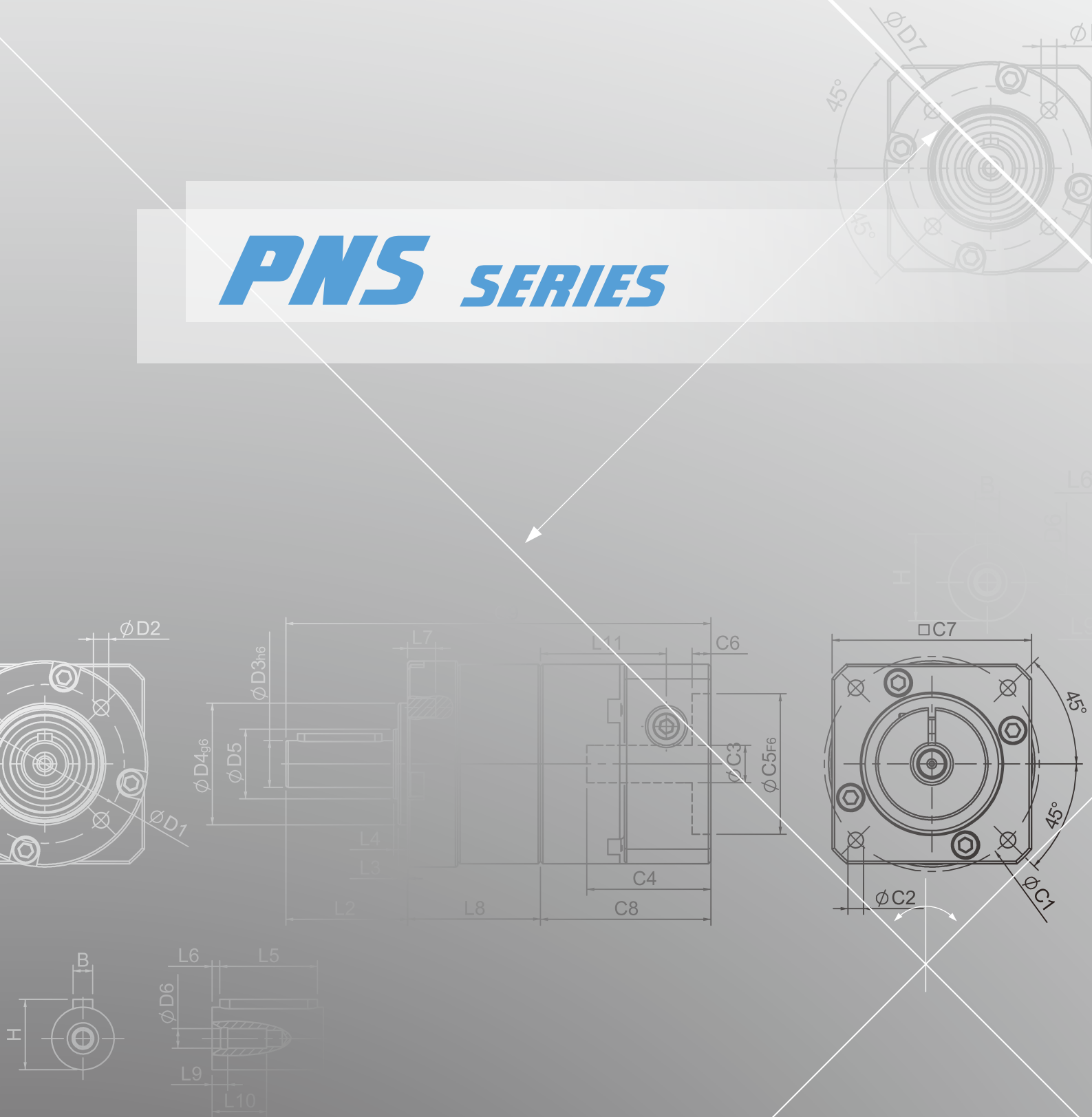
PAC

PAN

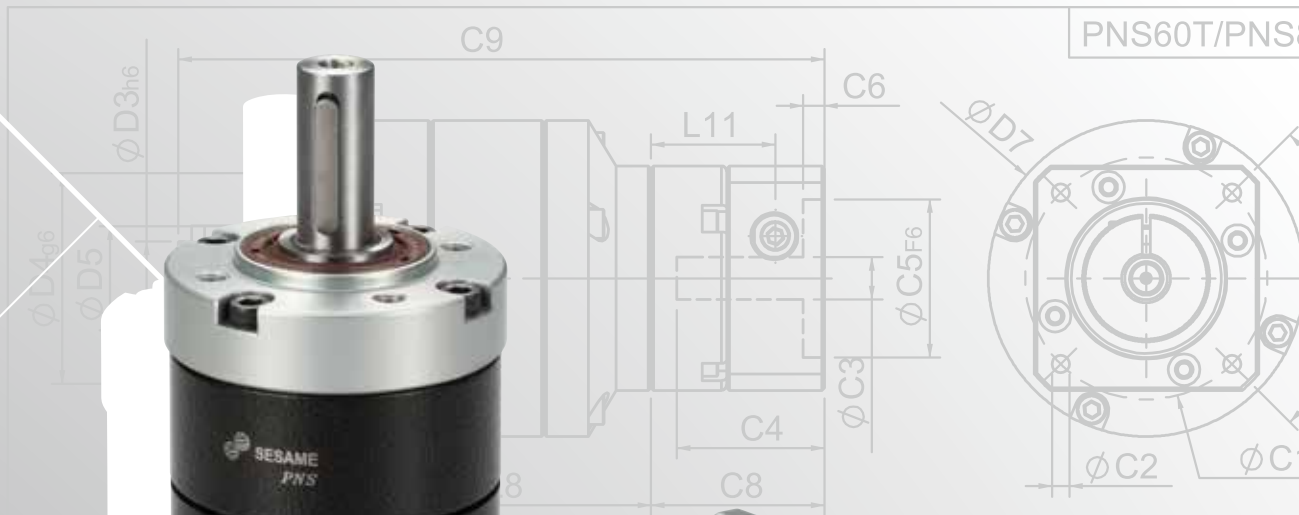
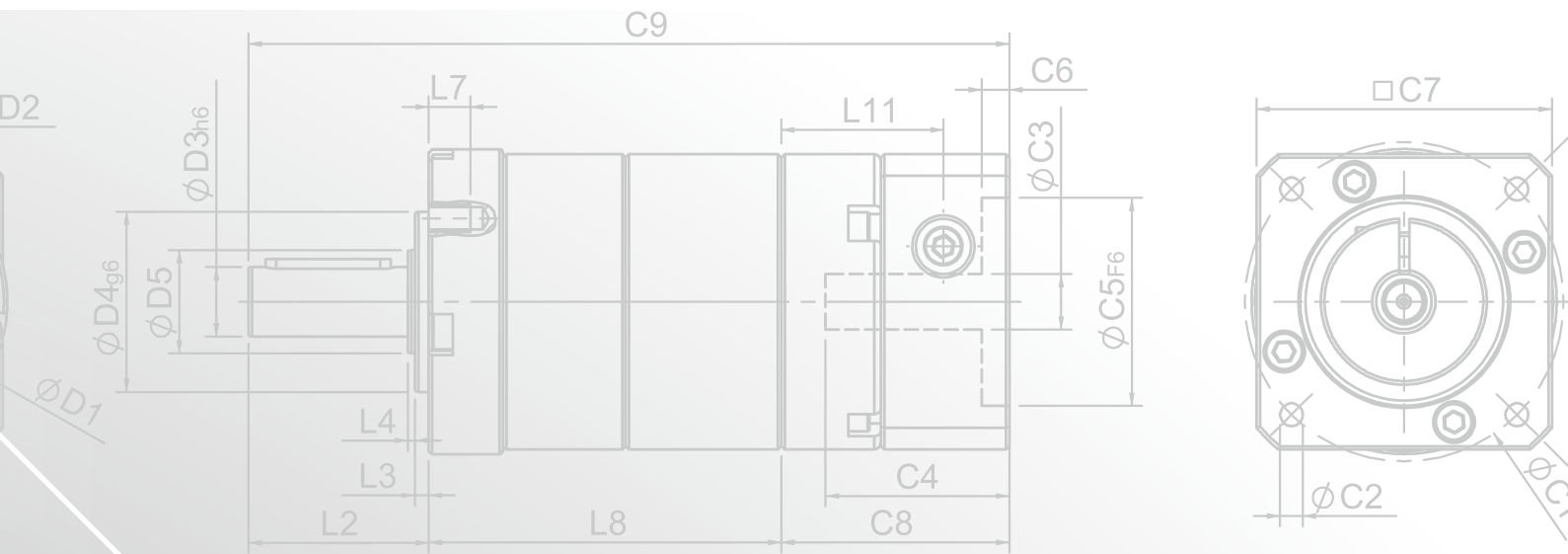
PGS

PNS

# ***PNS*** SERIES



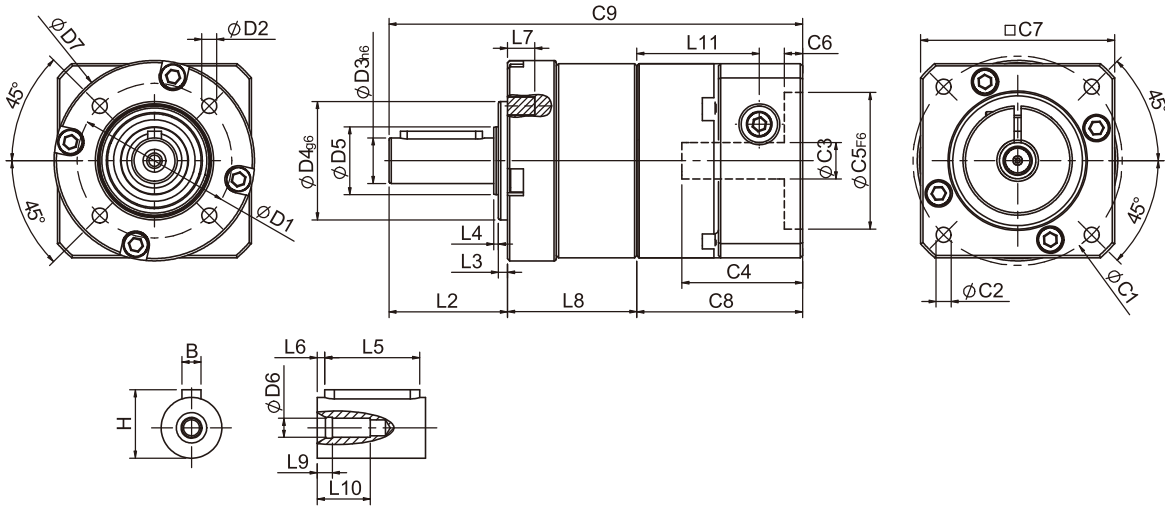




PNS60T/PNS



## PNS Single Stage Dimensions



## Specifications

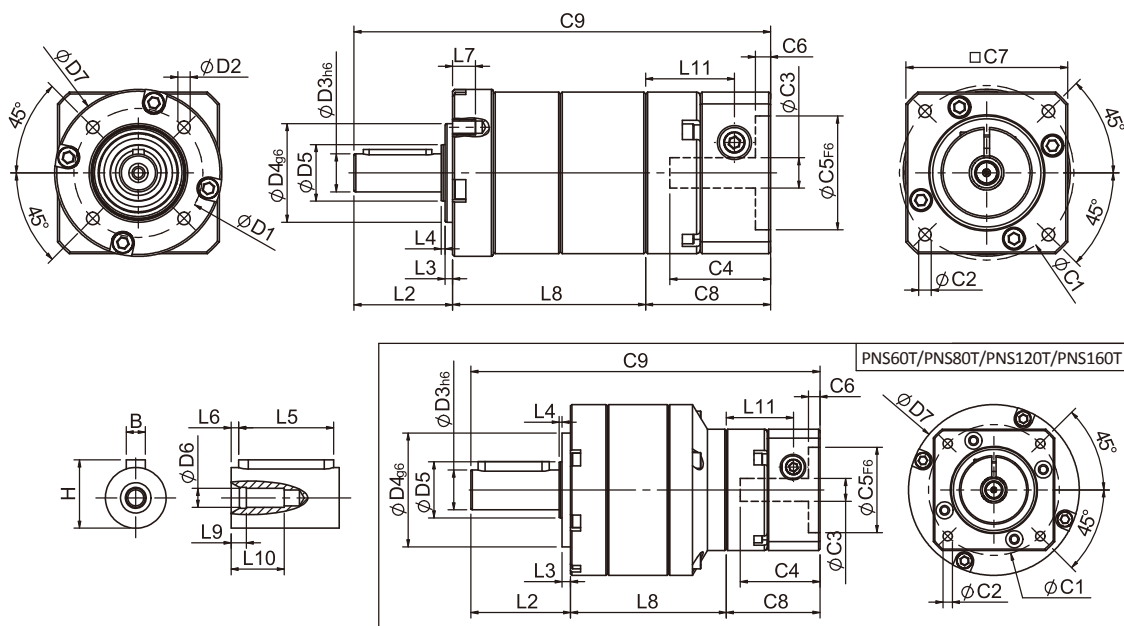
Unit:mm

Dimensions	PNS40	PNS60	PNS80	PNS120	PNS160
D1	34	52	70	100	145
D2	M4x0.7P	M5x0.8P	M6x1.0P	M10x1.5P	M12x1.75P
D3 <sub>h6</sub>	10	14	20	25	40
D4 <sub>g6</sub>	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 <sup>2</sup>	46	70	90	145	130
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P
C3 <sup>2</sup>	$\leq 8/\leq 11$	$\leq 14/\leq 19$	$\leq 19/\leq 24/\leq 28$	$\leq 24/\leq 32/\leq 38$	$\leq 35/\leq 38$
C4 <sup>2</sup>	26.5	33.5	41	51.5	66.5
C5 <sup>2</sup> <sub>F6</sub>	30	50	70	110	110
C6 <sup>2</sup>	4	4	6	6	5.5
C7 <sup>2</sup>	42.6	60	90	130	140
C8 <sup>2</sup>	36.4	42.1	51.5	68	80
C9 <sup>2</sup>	90.8	111.5	133.7	191.8	248
B	3	5	6	8	12
H	11.2	16	22.5	28	43

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

★ Specification subject to change without notice.

## PNS Double Stage Dimensions



## Specifications

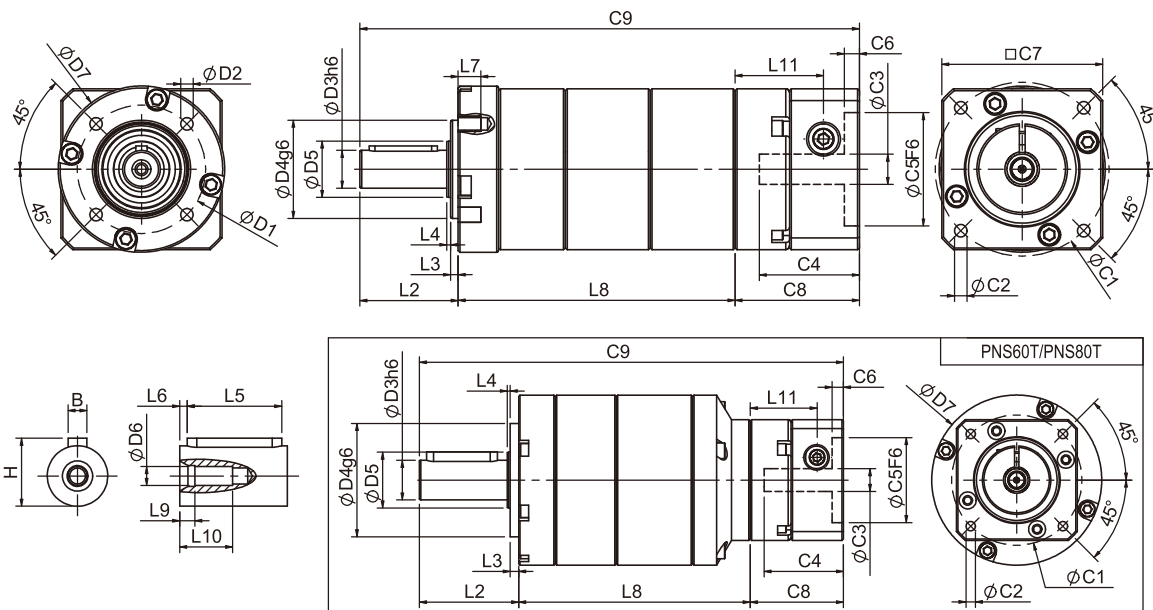
Unit:mm

Dimensions	PNS40	PNS60	PNS60T	PNS80	PNS80T	PNS120T	PNS160	PNS160T
D1	34	52		70		100	145	
D2	M4x0.7P	M5x0.8P		M6x1.0P		M10x1.5P	M12x1.75P	
D3 <sub>h6</sub>	10	14		20		25	40	
D4 <sub>g6</sub>	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	50.9	61.4	54.7	76	71.5	106.9	142	129
L9	3	4		4.5		6	6	
L10	9	16.5		16.5		26	38	
L11	23.4	31	23.4	37.3	31	37.3	63	42
C1 <sup>2</sup>	46	70	46	90	70	90	130	115
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P
C3 <sup>2</sup>	$\leq 8/\leq 11$	$\leq 14/\leq 19$	$\leq 8/\leq 11$	$\leq 19/\leq 24/\leq 28$	$\leq 14/\leq 19$	$\leq 19/\leq 24/\leq 28$	$\leq 35/\leq 38$	$\leq 24/\leq 28$
C4 <sup>2</sup>	26.5	33.5	26.5	41	33.5	41	66.5	53.5
C5 <sup>2</sup> <sub>F6</sub>	30	50	30	70	50	70	110	95
C6 <sup>2</sup>	4	4	4	6	4	6	5.5	5.5
C7 <sup>2</sup>	42.6	60	42.6	90	60	90	140	120
C8 <sup>2</sup>	32.9	41.5	32.9	51.5	41.5	51.5	80	58
C9 <sup>2</sup>	109.8	137.9	122.6	167.5	153	213.4	30	274
B	3	5		6		8	12	
H	11.2	16		22.5		28	43	

\* 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



## Specifications

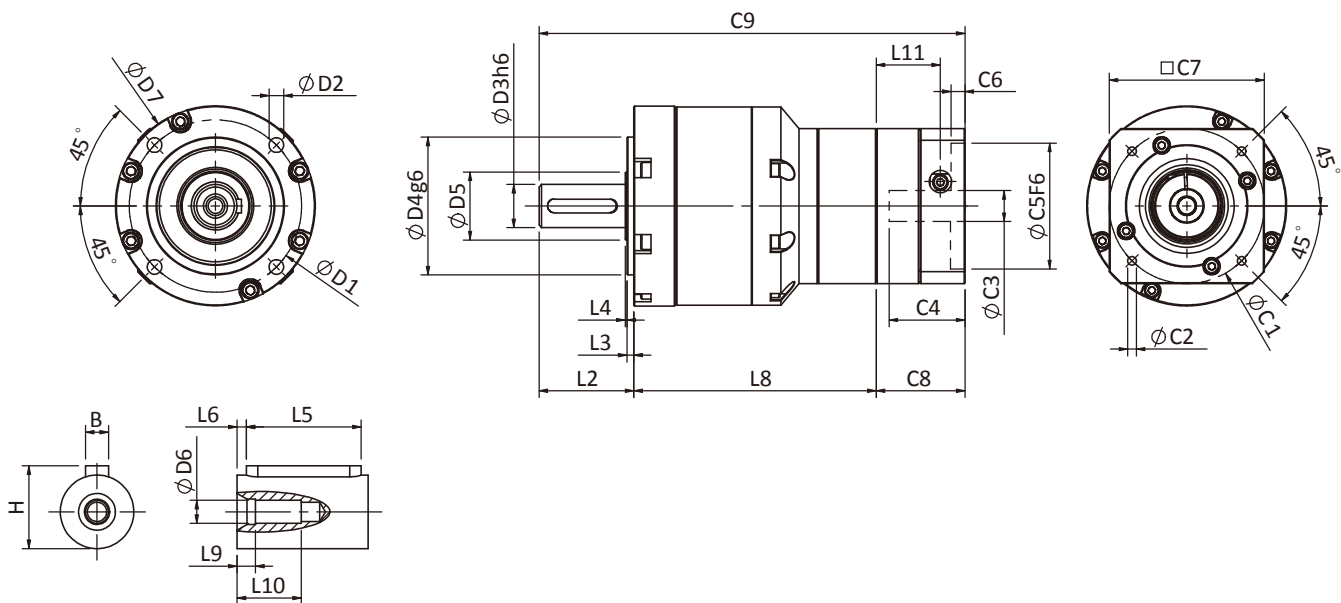
Unit:mm

Dimensions	PNS40	PNS60T	PNS80T
D1	34	52	70
D2	M4x0.7P	M5x0.8P	M6x1.0P
D3 <sub>h6</sub>	10	14	20
D4 <sub>g6</sub>	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 <sup>2</sup>	46	46	70
C2 <sup>2</sup>	M4x0.7P	M4x0.7P	M5x0.8P
C3 <sup>2</sup>	≤8/≤11	≤8/≤11	≤14/≤19
C4 <sup>2</sup>	26.5	26.5	33.5
C5 <sup>2</sup> <sub>F6</sub>	30	30	50
C6 <sup>2</sup>	4	4	4
C7 <sup>2</sup>	42.6	42.6	60
C8 <sup>2</sup>	32.9	32.9	41.5
C9 <sup>2</sup>	132.2	149.6	186.8
B	3	5	6
H	11.2	16	22.5

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

★ Specification subject to change without notice.

## PNS Triple Stage Dimensions



## Specifications

Unit:mm

Dimensions	PNS120T	PNS160T
D1	100	145
D2	M10x1.5P	M12x1.75P
D3 <sub>h6</sub>	25	40
D4 <sub>g6</sub>	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 <sup>2</sup>	90	115
C2 <sup>2</sup>	M6x1.0P	M8x1.25P
C3 <sup>2</sup>	≅ 19/ ≅ 24/ ≅ 28	≅ 24/ ≅ 28
C4 <sup>2</sup>	41	53.5
C5 <sup>2</sup> <sub>F6</sub>	70	95
C6 <sup>2</sup>	6	5.5
C7 <sup>2</sup>	90	120
C8 <sup>2</sup>	51.5	58
C9 <sup>2</sup>	247.2	322
B	8	12
H	28	43

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

★ Specification subject to change without notice.

## PNS Specifications Table

Specifications		Stage	Ratio	PNS-40	PNS-60	PNS-80	PNS-120	PNS160		
Nominal Output Torque $T_{2N}$	N • m	1	3	9	28	85	200	420		
			4	10	32	80	215	490		
			5	11	35	95	215	473		
			7	10	28	85	200	400		
			9	8	23	75	195	320		
			10	8	21	65	180	320		
		Stage	Ratio	PNS-40	PNS-60 / PNS-60T	PNS-80 / PNS-80T	PNS-120T	PNS160 / PNS160T		
		2	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		
			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	PNS-40	PNS-60T	PNS-80T	PNS-120T	PNS160T		
		3	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		
			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		
		Emergency Stop Torque $T_{2NOT}$	N • m	2.5 times of Nominal Output Torque (* Max. Output Torque $T_{2B}$ = 60% of Emergency Stop Torque)						
		Nominal Input Speed $n_{1N}$	rpm	1,2,3	3-1000	4000	4000	3000	2500	2500
Max. Input Speed $n_{1max}$	rpm	1,2,3	3-1000	6000	6000	6000	5000	4000		
Standard Backlash P2	arcmin	1	3-10	≤ 9	≤ 8	≤ 7	≤ 6	≤ 5		
		2	15-100	≤ 12	≤ 10	≤ 9	≤ 8	≤ 7		
		3	125~1000	≤ 15	≤ 12	≤ 12	≤ 12	≤ 10		
Torsional Rigidity	N • m / arcmin	1,2,3	3-1000	1.2	3.5	8.5	17	30		
Max. Radial Load $F_{2RB}^1$	N	1,2,3	3-1000	580	890	2050	4370	6720		
Max. Axial Load $F_{2aB}^1$	N	1,2,3	3-1000	410	430	1100	2630	4200		
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	%	1	3-10	≥ 95%						
		2	15-100	≥ 90%						
		3	125~1000	≥ 85%						
Weight	kg	1	3-10	0.5	1.1	2.8	6.3	15.6		
		2	15-100	0.7	1.5/1.3	4.2/3.1	7.9	20.7/17.2		
		3	125~1000	0.8	1.7	4.5	9.3	9.3/19.2		
Mounting Position	-	1,2,3	3-1000	Any direction						
Noise Level <sup>2</sup>	dBA/1m	1,2,3	3-1000	60	63	66	67	68		
Protection Class	-	1,2,3	3-1000	IP65						
Lubrication	-	1,2,3	3-1000	Synthetic Lubricant						
Inertia (J1)										
Stage	Ratio	unit	PNS-40(ψ8)	PNS-60(ψ14)	PNS-80(ψ19)	PNS-120(ψ24)	PNS-160(ψ35)			
1	3	Kg • cm <sup>2</sup>	0.04	0.23	0.77	2.30	7.89			
	4		0.03	0.21	0.67	1.92	5.83			
	5~10		0.03	0.21	0.61	1.71	5.38			
Stage	Ratio		PNS-40(ψ8)	PNS-60(ψ14) / PNS-60T(ψ8)	PNS-80(ψ19) / PNS-80T(ψ14)	PNS-120T(ψ19)	PNS-160(ψ35) / PNS-160T(ψ24)			
2	15		0.04	0.23(0.04)	0.77(0.23)	0.77	5.38 (1.61)			
	Other ratios		0.03	0.21(0.03)	0.61(0.21)	0.61	5.38 (1.61)			
Stage	Ratio		PNS-40(ψ8)	PNS-60T(ψ8)	PNS-80T(ψ14)	PNS-120T(ψ19)	PNS-160T(ψ24)			
3	All ratios		0.03	0.03	0.21	0.61	1.61			

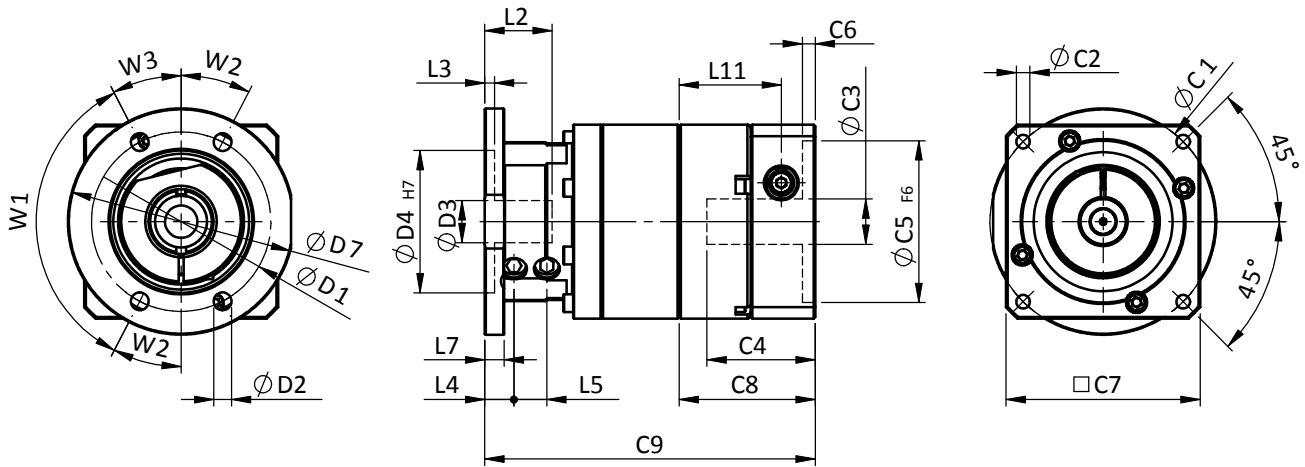
\* 1. Applied to the output shaft center @100rpm.  
\* 2. Measured at 3000 rpm with no load. These values are measured by gearbox with ratio = 10 (1-stage) or ratio = 100 (2-stage) at nominal input speed or 3000 rpm (if nominal input speed is higher than 3000 rpm) with no load.  
※ The above figures/specifications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

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# ***PGW SERIES***



## PGW Single Stage Dimensions



## Specifications

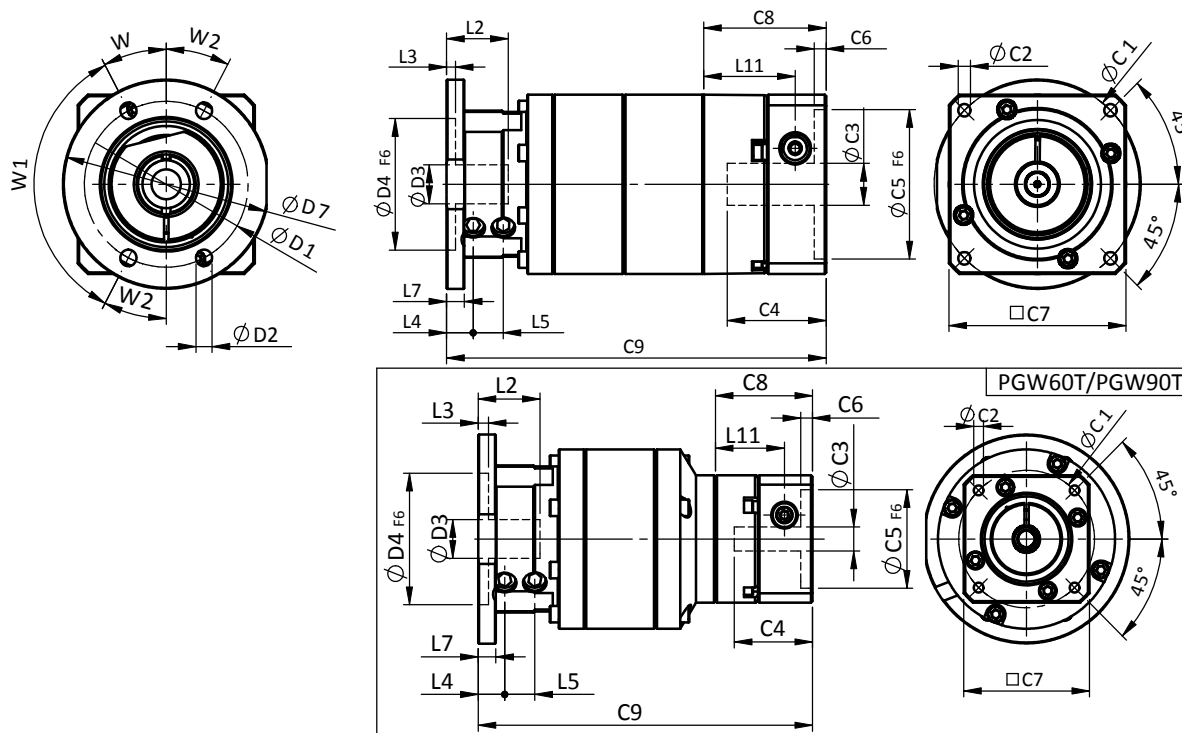
Unit:mm

Dimensions	PGW60	PGW90
D1	55.5	73
D2	5.5	5.5
D3	16	20
D4 <sub>H7</sub>	44	60
D7	70	84
L2	31	31
L3	3.5	3.5
L4	9	10.2
L5	10.2	10.9
L7	6	6
L11	31.6	37.3
W1	125°	90°
W2	27.5°	22.5°
W3	27.5°	67.5°
C1 <sup>2</sup>	70	90
C2 <sup>2</sup>	M5x0.8P	M6x1.0P
C3 <sup>2</sup>	≤14/≤19	≤19/≤24/≤28
C4 <sup>2</sup>	33.5	41
C5 <sup>2</sup> <sub>F6</sub>	50	70
C6 <sup>2</sup>	4	6
C7 <sup>2</sup>	60	90
C8 <sup>2</sup>	42.1	51.5
C9 <sup>2</sup>	102.2	126.5

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



## PGW Double Stage Dimensions



## Specifications

Unit:mm

Dimensions	PGW60	PGW60T	PGW90	PGW90T
D1		55.5		73
D2		5.5		5.5
D3		16		20
D4 <sub>F6</sub>		44		60
D7		70		84
L2		31		31
L3		3.5		3.5
L4		9		10.2
L5		10.2		10.9
L7		6		6
L11	31	23.4	37.3	31
W1		125°		90°
W2		27.5°		22.5°
W3		27.5°		67.5°
C1 <sup>2</sup>	70	46	90	46
C2 <sup>2</sup>	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P
C3 <sup>2</sup>	≤14/≤19	≤8 /≤11	≤19/≤24/≤28	≤14/≤19
C4 <sup>2</sup>	33.5	26.5	41	33.5
C5 <sup>2</sup> <sub>F6</sub>	50	30	70	50
C6 <sup>2</sup>	4	4	6	4
C7 <sup>2</sup>	60	42.6	90	60
C8 <sup>2</sup>	41.5	32.9	51.5	41.5
C9 <sup>2</sup>	128.6	113.3	160.3	145.8

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

## PGW Specifications

Specifications		Stage	Ratio	PGW-60	PGW-90	PGW-115	
Nominal Output Torque $T_{2N}$	N • m	1	3	28	85	200	
			4	32	80	215	
			5	35	95	215	
			7	28	85	200	
			9	23	75	195	
			10	21	65	180	
		Stage	Ratio	PGW-60/PGW-60T	PGW-90/PGW-90T	PGW-115T	
		2	15	35/24	95/68	168	
			20	35/31	95/95	215	
			25	35/30	95/95	215	
			35	35/28	95/95	215	
			45	35/27	95/92	215	
			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	PGW-60T	PGW-90T	PGW-115T	
		3	125	35	95	215	
			175	35	95	215	
			225	35	95	215	
			245	35	95	215	
			315	35	95	215	
			405	35	95	215	
			567	28	85	200	
			729	23	75	195	
			1000	21	65	180	
		Emergency Stop Torque $T_{2NOT}$	N • m	(2.5 times of Nominal Output Torque) *Max. Output Torque $T_{2B}$ = 60% of Emergency Stop Torque)			
Nominal Input Speed $n_{1N}$	rpm	1,2,3	3-1000	4000	3000	2500	
Max. Input Speed $n_{1max}$	rpm	1,2,3	3-1000	6000	6000	5000	
Standard Backlash P2	arcmin	1	3-10	≤ 8	≤ 7	≤ 6	
		2	15-100	≤ 10	≤ 9	≤ 8	
		3	125~1000	≤ 12	≤ 12	≤ 12	
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	%	1	3-10	≥ 95%			
		2	15-100	≥ 90%			
		3	125~1000	≥ 85%			
Weight	kg	1	3-10	1.2	2.9	6.4	
		2	15-100	1.6/1.4	4.3/3.2	8.0	
		3	125~1000	1.8	4.6	9.4	
Mounting Position	-	1,2,3	3-1000	Any direction			
Noise Level <sup>2</sup>	dBA/1m	1,2,3	3-1000	63	66	67	
Protection Class	-	1,2,3	3-1000	IP 65			
Lubrication	-	1,2,3	3-1000	Synthetic Lubricant			
Inertia (J1)							
Stage	Ratio	unit		PGW-60 (ψ14)	PGW-90 (ψ19)	PGW-115 (ψ24)	
1	3	Kg • cm <sup>2</sup>		0.23	0.77	2.30	
	4			0.21	0.67	1.92	
	5~10			0.21	0.61	1.71	
Stage	Ratio			PGW-60 (ψ14) PGW-60T (ψ8)	PGW-90 (ψ19) PGW-90T (ψ14)	PGW-115T (ψ19)	
2	15			0.23/0.04	0.77/0.23	0.77	
	Other ratios			0.21/0.03	0.61/0.21	0.61	
3	All ratios	PGW-60T (ψ8)	PGW-90T (ψ14)	PGW-115T (ψ19)			
		0.03	0.21	0.61			

\* 1. Applied to the output shaft center @100rpm.  
\* 2. Measured at 3000rpm with no load.  
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PHL  
PHFR  
PHF  
PGH  
PUR  
PUL  
PGLH  
PGL  
PGC  
PGE  
PGRH  
PGR  
PGRF  
PGF  
PBC  
PBE  
PAE  
PAC  
PAN  
PGS  
PGW