



Sesame Motor Corp., A leading brand in gear technology.

PLANETARY GEARHEADS



100%

Made in Taiwan

www.sesamemotor.com



ISO 9001



ISO 14001





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PREMIUM TYPE

- | | | | |
|----|-------------|----|------------|
| 19 | PHL Series | 43 | PGH Series |
| 25 | PHFR Series | 49 | PUR Series |
| 33 | PHF Series | 55 | PUL Series |



PRECISION ADVANCED TYPE PRECISION TYPE

- | | | | |
|----|-------------|-----|-------------|
| 61 | PUA Series | 105 | PGE Series |
| 67 | PGLH Series | 111 | SGC Series |
| 73 | PGCH Series | 117 | SGE Series |
| 79 | PGEH Series | 123 | PGRH Series |
| 85 | PGSH Series | 131 | PGR Series |
| 91 | PGL Series | 137 | PGFR Series |
| 99 | PGC Series | 145 | PGF Series |



STANDARD TYPE

- | | | | |
|-----|------------|-----|------------|
| 167 | PAE Series | 185 | PGS Series |
| 173 | PAC Series | 191 | PNS Series |
| 179 | PAN Series | 199 | PGW Series |



PRIMARY TYPE

- 155 PBC Series
- 161 PBE Series

Company Profile

"SESAME MOTOR CORP." founded in 1990, have nearly 30 years of professional motor and gearbox manufacturing and sales experience. Sesame Motor's 7000 square meters factory locates at Taichung City. Adding modern workshop facilities with the effective integration of ERP systems, purchase world class processing and testing equipment; as we continuously enhance key parts' productivity we had not only expending overall productivity, shorten delivery, and ensure products' quality to achieve customer satisfaction. SESAME MOTOR products have received unanimous praise.



Quality Policy :

- "Honesty" , to provide integrity and pragmatic services
- "Creativity" , to create customer competitive advantage
- "Positivity" , positive support and responsibility
- "Innovation" , moving forward of technical innovation

Environmental Policy :

- Full participation to comply with eco-regulation
- Prevent pollution; save energy and reduce waste
- Keep improving and propagating Green Concept

"SESAME MOTOR" is built base on spirit of "customer satisfaction, priority service" philosophy, providing three privileges "best quality, fastest delivery, and best sale service" . Our products have obtained high market share in Taiwan, that had lead "SESAME MOTOR" be a well-known brand. In addition to our official branch in Shanghai, we have agents in the United States, Germany, Denmark, Poland, UK, Turkey, Russia, Korea, Japan, China, Thailand, Malaysia and India. Trademark registered in major countries all over the world.

"SESAME MOTOR" has been successively obtained CE, CCC, UL, ISO9001 and ISO14001 certification and honorary awards. "SESAME MOTOR" also has a professional R&D team and experienced production-related sectors; can provide high accuracy products for different customer needs; high-quality servo gearhead and the surrounding transmission components, develop and produce other kinds of gear; customized motor products. **All Sesame products are 100% Made in Taiwan**, including raw material, development, design, machining and assembly, to offer the best solutions with detailed-oriented, high precision, high efficiency and low noise properties. Product will be used in tool machines, industrial robots, semiconductor devices, aircraft industrial, medical and rehabilitation equipment, electric scooter, auto storage devices, green energy-related industries, testing and food machinery, bakery equipment, packaging machinery and agricultural equipment and other sophisticated automation equipment.





Vision

“SESAME MOTOR” strong operating team adhere to the blue ocean strategy of entering the international market and high-tech field, to create the future more professional, better quality of sustainable management systems, establishment of “a combination of leading technology and brand reputation” for competitive advantage.

Mission

We adhere to three product principles of "technology, environmental protection, innovation", as entering the era of Industry 4.0, providing contribution to precision automation equipment in various fields.

Business Philosophy

Corporate Culture

“SESAME MOTOR” continuously providing quality products and best services; with “Honesty” for providing integrity and pragmatic service; with “Creativity” given customer advantage competitiveness; with "Positivity" to support and responsible for the efficiency of productivity; with "Innovation" on profession and knowledge of knowhow. Taking into account environment protection, employee welfare and sustainable management, we aim to become the first market trend indicators.

Quality Products

We offer premium performance planetary gearboxes, gear motors and customized products with a strong R&D team.

Priority Service

“SESAME MOTOR” is moving forward to globalization based on spirit of “customer satisfaction, priority service” philosophy, providing three privileges “best quality, fastest delivery, and best sale service”.



Trade Mark & Certification



CE Certification

UL Certification

ISO 9001:2015

ISO 14001:2015



China Compulsory Certification (CCC)



Gearhead PHL Series China SIPO Patent



The United States, Canada, European Union, China, Taiwan, Japan, Korea, Iran, The Philippines, Vietnam, Indonesia, Malaysia, Singapore ...etc. trade mark certifications.

Corporate Environment



PLANETARY GEARHEADS



Production Line



Planetary Gearheads Production Line



Induction Motor and
Speed Reducer Production Line



Precision Gear Motor Production Line

Applications

Applications of Planetary Gearhead

Machine Tools

Metal Cutting Machines, Machining Centers, CNC Drilling Machines, Lathes and Turning Machines, Milling and Boring Machines, Grinding Machines, Drilling Machines, Planning Machines, Metal Forming Machine Tools, Presses, Tube and Wire Processing Machines.

Industry Machinery

Packaging Machinery, Food and Beverage Processing Machinery, Bakery Equipment, Agricultural Machinery, Textile Machinery, Shoemaking Machinery, Wood Working Machinery, Printing Machinery, Plastic processing Machinery, Laser Cutting and Welding Machines.

Automation Equipment

Industrial Robots, Semiconductor Devices, Automatic Storage System, Surface Treatment Equipments.

Aerospace Industry

Medical and Rehabilitation Equipment

Electric Scooter

Green Energy-Related Industries

Testing Devices

Automation and Precise Positioning Equipment with Servo Motors



PLANETARY GEARHEAD SERIES LINEUP

Program Features & Benefits

- Multiple design configurations and performance levels
- Adapters for all servo motors
- Drop-ins for most industry standards
- Hardened and ground gearing
- One-piece planet carrier/output shaft on most models
- Planets with full needle bearing support
- IP65 protection on most models



Premium Type

- Backlash as low as 1 arc-minute, ultimate performance
- 3 designs to choose from, up to 7 sizes available
- Capacity from 10-2000 Nm

Precision Advanced Type

- 3 levels of backlash, for demanding applications
- 3 designs configurations, 7 frame sizes 42-220 mm
- Square or round mounting, ratio from 3-100:1

Precision Type

- 3 levels of backlash, 4 design configurations
- 7 frame sizes 42-220 mm
- Square or round mounting, ratio from 3-100 : 1
- Stainless steel series available

Standard Type

- 5 frame sizes 42-115 mm, general purpose applications
- Good backlash values, ratios up to 1000:1
- Reliable operating performance, cost effective integration

Primary Type

- 5 frame sizes 42-115 mm, general purpose applications
- Good backlash values, ratios up to 1000:1
- Reliable operating performance, cost effective integration

Output Shaft

In-line Series

- Multiple models and performance levels including stainless steel material ready for most industry applications
- 3 levels of backlash, frame sizes 42-220 mm
- Square or round mounting, ratios up to 1000:1

Right Angle Series

- 3 models to choose from, saving linear space
- 3 backlash levels, 7 sizes from 42-220 mm
- Premium and precision designs, ratios from 3-200:1

Output Flange

- Right angle and inline models, ISO mounting dimensions
- 3 levels of backlash, 7 frame sizes available
- High moment and axial load capacity

Output Flange

In-line Series



PHL Series
High Precision



PGH Series
High Performance



PUL Series
High Radial Load



PUR Series



PHF Series



PHFR Series

Right Angle



PGLH Series



PGCH Series



PGEH Series



PUA Series



PGSH Series



PGRH Series



PGF Series



PGFR Series



PGL Series



PGE Series



PGC Series



SGC Series
Stainless Steel



SGE Series
Stainless Steel



PGR Series



PAC Series



PAE Series



PGS Series



PAN Series (NEMA)
High Ratio
(max. i=1000)



PNS Series
High Ratio
(max. i=1000)



PNSR Series



PGW Series



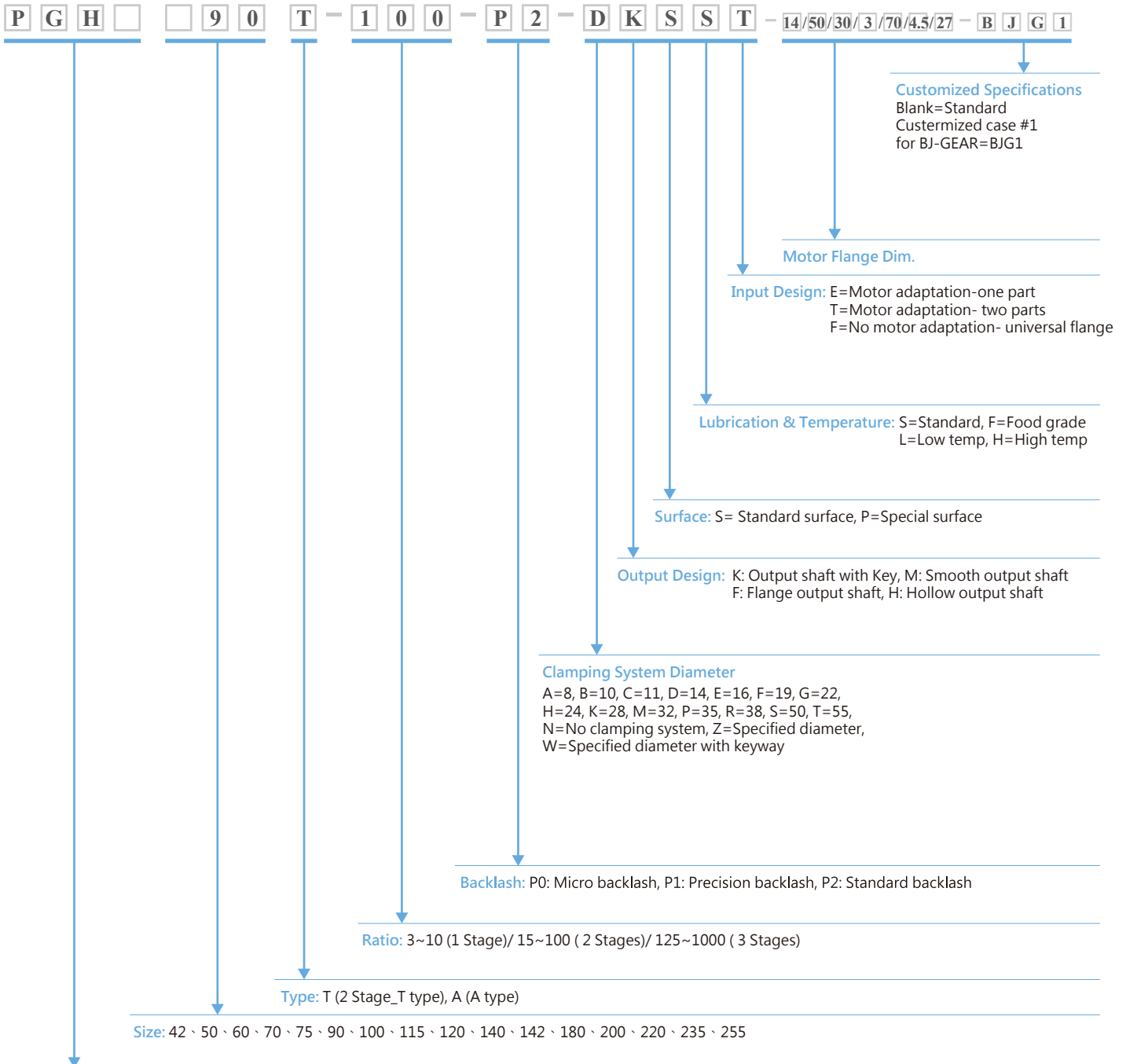
PBC Series
High Ratio (max. i=1000)



PBE Series
High Ratio (max. i=1000)

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

CODING SYSTEM

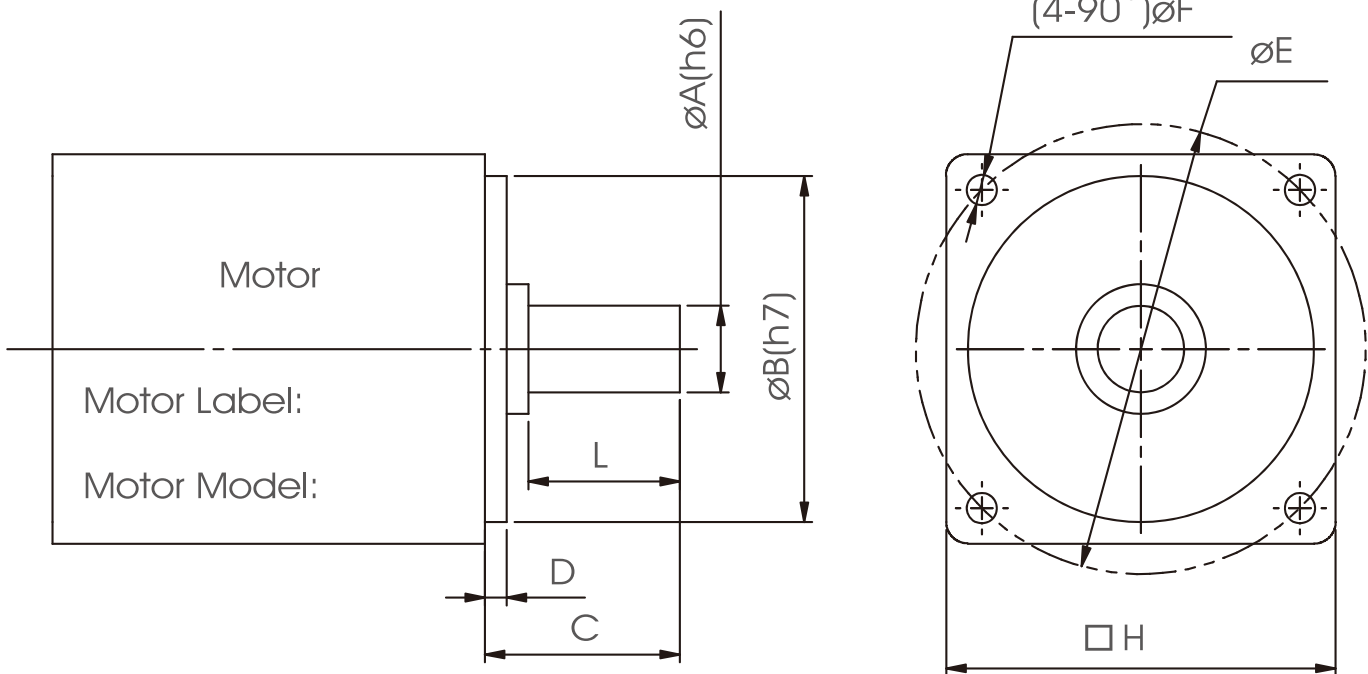


Series: PHL/PGH/PGRH/PGLH/PGSH/PGCH/PGEH (Output Shaft)
PGL/PGR/PGE/PEE/PGC/PEC (Output Shaft)
PUL/PUA/PUR (Output Shaft/High Radial Force)
PHF/PGF/PHFR/PGFR (Output Flange)
PAE/PAC/PGS/PAN/PNS (Output Shaft)
PBE/PBC (Output Shaft) ; SGC/SGE (Stainless Steel/Output Shaft)
PGW (Hollow Output Shaft)

Motor Flange Dimensions:

Motor shaft diameter A =5/6/6.35/8/9/11/9.5/9.525/10/11/12/12.7/14/15.875/16/19/20/22/24/28/32/35/38/42/48/50/55
Flange diameter B=30/50/70/90/110/130... ; Motor shaft length C=25/40/50/79... ; Flange height D=2/3/4/5...
PCD of bore E=43.38/66.67/70/90/115... ; Bore diameter F=3.4/4.5/5.1/6.6/9... ; Effective length of motor shaft L=21/27...

FILL IN DATA OF MOTOR



SPECIFICATIONS

Motor Shaft Dia.	Flange Dia.	Motor Shaft Length	Flange Height	P.C.D of Bore	Bore Dia.	Motor Flange Square	Actual Length of Motor Shaft	Backlash
$\varnothing A(h6)$	$\varnothing B(h7)$	C	D	$\varnothing E$	$\varnothing F$	$\square H$	L	P0/P1/P2

* Sesame Planetary Gearheads are produced under strictly exclusive Pairing Process to ensure accuracy and lifespan.

* The above motor shaft and flange dimensions are required to prevent selection error when ordering gearheads. Online selection tools are available to configure and draw SESAME planetary gearheads, please visit www.sesamemotor.com.

1.NOTE

1.1 Preparation before installation

- Please read this operation manual before using gearheads. Any problems caused by inappropriate operation contrary with the manual, or damage caused by natural disasters, or restructure the gearheads without our permission, Sesame will not hold any responsibility nor will the gearheads be covered by warranty.
- Warranty is one year after purchase of the gearheads. Within warranty period, if gearheads damage is not caused by operation error nor by natural disaster, then please send back the gearheads, we should replace the damage spare part at free of charge.
- Installation, disassemble, maintenance on the gearheads, needed to be performed by trained technicians.
- According to the application and operation environment, the gearheads temperature might be raising after period of running. Please do not touch the gearheads directly during operation, or right off from operation.
- Do not touch any rotating components when the gearheads are running. Ensure that the plugs of the gearheads were inserted after installation. Avoid any small object fall into the gearheads.
- Handle the gearheads gently during installation, do not knock the gearheads by any tool, to avoid the influence of running accuracy.
- Do not disassemble or modify gearheads to prevent injury or equipment damage .
- Synthetic lubricant is sealed in gearheads, there is no need to change lubricant.

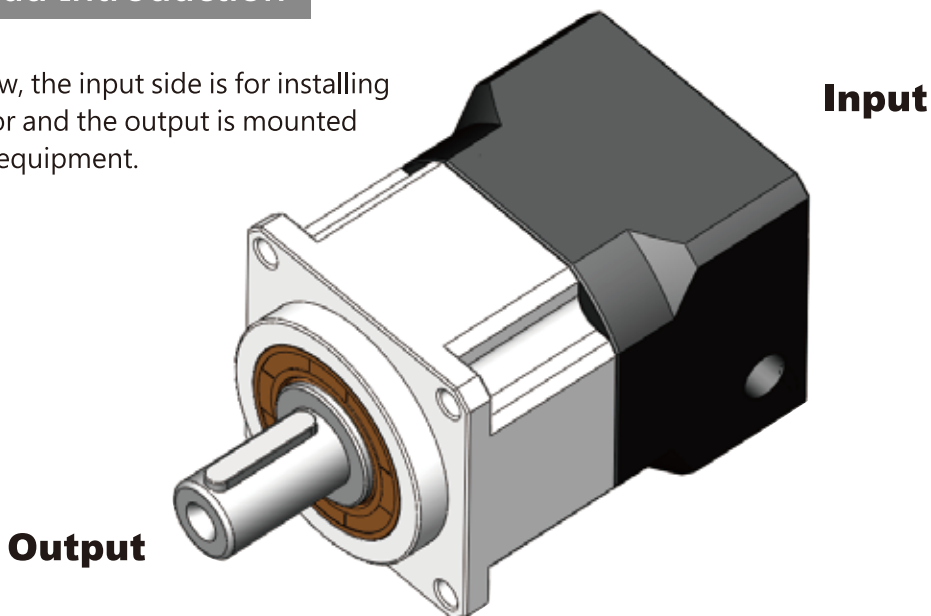
1.2 Installation environment limitation

Gearheads must be installed under following terms to prevent damages which are not covered by warranty.

- Gearheads are designed or manufactured to be used with other mechanical equipment assembly.
- Operate temperature is between $-10\text{ }^{\circ}\text{C}$ to $+90\text{ }^{\circ}\text{C}$.
- Operate altitude may not be higher than 1000 m above sea-level
- Avoid continuity vibration or impact.
- Avoid gearbox used in flammable gas or corrosion gas environment.
- Humidity: no more than 85%, in order to avoid condensation.
- Avoid direct sunlight, dust accumulation.
- Avoid water or oil splashed.
- Used in good ventilated place.

2. Gearhead Introduction

As shown below, the input side is for installing the servo motor and the output is mounted to application equipment.



To ensure the product performance, both the input and output ends must be protected carefully to avoid any damage and cause improper operation.

PLANETARY GEARHEAD WITH MOTOR MOUNTING INSTRUCTIONS

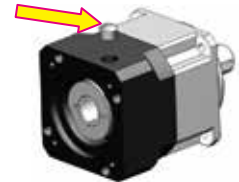
For Parallel Type

1



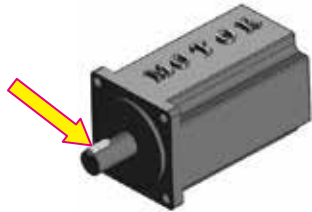
Check the motor and gearbox size. Clean the mounting surface.

2



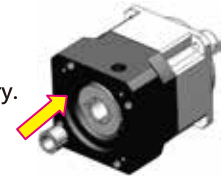
Take off the plug from the bracket. Revolve the set collar until the bolt is aligned with the hole.

3



Remove the key from the motor shaft. Mounting the balance key if necessary.

4



Make sure the motor shaft size. Choose the right bushing if necessary.



As installing on flatted shaft, be sure to align the collet gap over the flat and the set collar bolt perpendicular to the flat.

5



Install gearbox and motor vertically. Tighten the set collar bolt with torque wrench to 5% of specified torque.

6



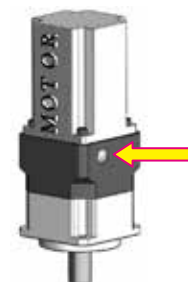
Tighten the mounting bolts in 1~4 order with torque wrench to specified torque.

7



Tighten the set collar bolt with torque wrench to specified torque.

8



Put the plug back.

For Hollow Spindle

1

Check the motor and gearbox size. Clean the mounting surface.



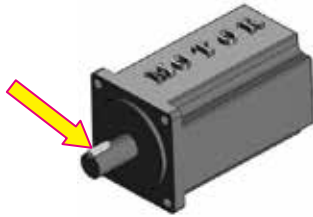
2

Take off the plug from the adapter plate. Revolve the set collar until the bolt is aligned with the hole.



3

Remove the key from the motor shaft. Mounting the balance key if necessary.



4

Make sure the motor shaft size. Choose the right bushing if necessary.

As installing on flatted shaft, be sure to align the collet gap over the flat and the set collar bolt perpendicular to the flat.



5

Install gearbox and motor vertically. Tighten the set collar bolt with torque wrench to 5% of specified torque.



6

Tighten the mounting bolts in 1~4 order with torque wrench to specified torque.



7

Tighten the set collar bolt with torque wrench to specified torque.



8

Put the plug back.



Tightening Torque Table

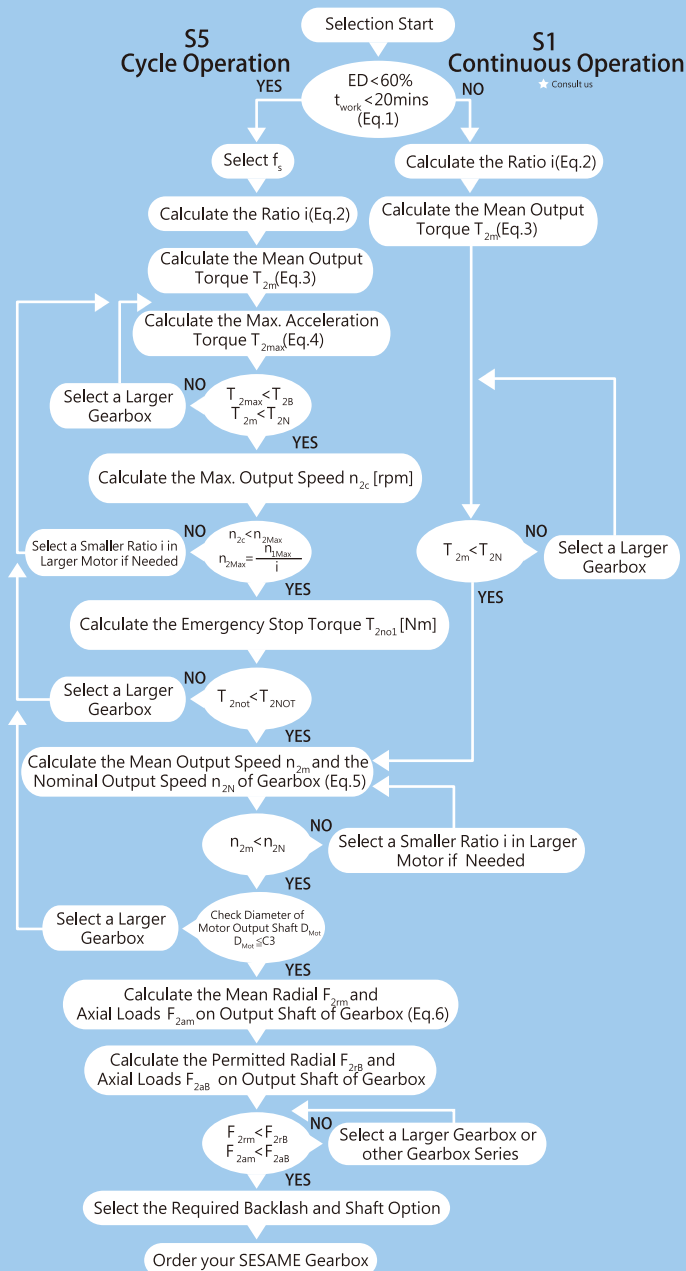
Tightening Torque Recommended for Motor Mounting Bolt

Bolt Size	Width Across Flats	Strength 12.9 Tightening Torque	
	mm	N-m	In-lbs
M3*0.5P	2.5	2.1	19
M4*0.7P	3	4.9	44
M5*0.8P	4	9.8	87
M6*1P	5	17	151
M8*1.25P	6	41	364
M10*1.5P	8	80	709
M12*1.75P	10	139	1232
M14*2P	12	223	1976
M16*2P	14	343	3038

Note 1: Holding torques must be bigger than values shown above. Bolts can be tightened up to 20% higher for increased holding.

SELECTION OF THE OPTIMUM GEARHEAD

Selection of the Optimum Gearhead



Recommended (for S5 Cycle Operation)

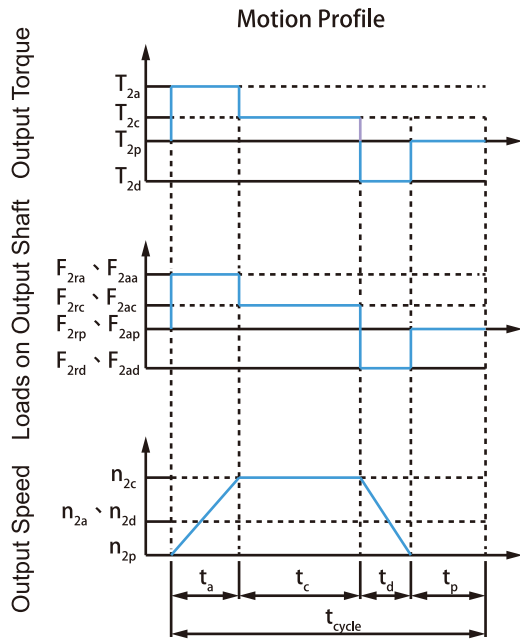
The general design is given for

$$\frac{J_L}{i^2} \leq 4 \times J_m$$

The optimal design is given for

$$\frac{J_L}{i^2} \leq J_m$$

J_L Load Inertia
 J_m Motor Inertia



$$1. ED = \frac{t_{work}}{t_{cycle}} \times 100\%, t_{work} = t_a + t_c + t_d$$

Index : a. Acceleration, c. Constant, d. Deceleration, p. Pause (Eq.1)

$$2. i \cong \frac{n_m}{n_{work}}$$

n_m Output Speed of the Motor
 n_{work} Working Speed (Eq.2)

$$3. T_{2m} = 3 \sqrt{\frac{n_{2a} \times t_a \times T_{2a}^3 + n_{2c} \times t_c \times T_{2c}^3 + n_{2d} \times t_d \times T_{2d}^3}{n_{2a} \times t_a + n_{2c} \times t_c + n_{2d} \times t_d}}$$

(Eq.3)

$$4. T_{2max} = T_{mB} \times i \times f_s \times \eta$$

Where f_s is

f_s	No. of Cycles / hr
1.0	0 ~ 1,000
1.1	1,000 ~ 1,500
1.3	1,500 ~ 2,000
1.6	2,000 ~ 3,000
1.8	3,000 ~ 5,000

T_{mB} Max. Output Torque of the Motor
 η Efficiency of the Gearbox (Eq.4)

$$5. n_{2a} = n_{2d} = \frac{1}{2} \times n_{2c}$$

$$n_{2m} = \frac{n_{2a} \times t_a + n_{2c} \times t_c + n_{2d} \times t_d}{t_a + t_c + t_d}$$

$$n_{2N} = \frac{n_{1N}}{i}$$

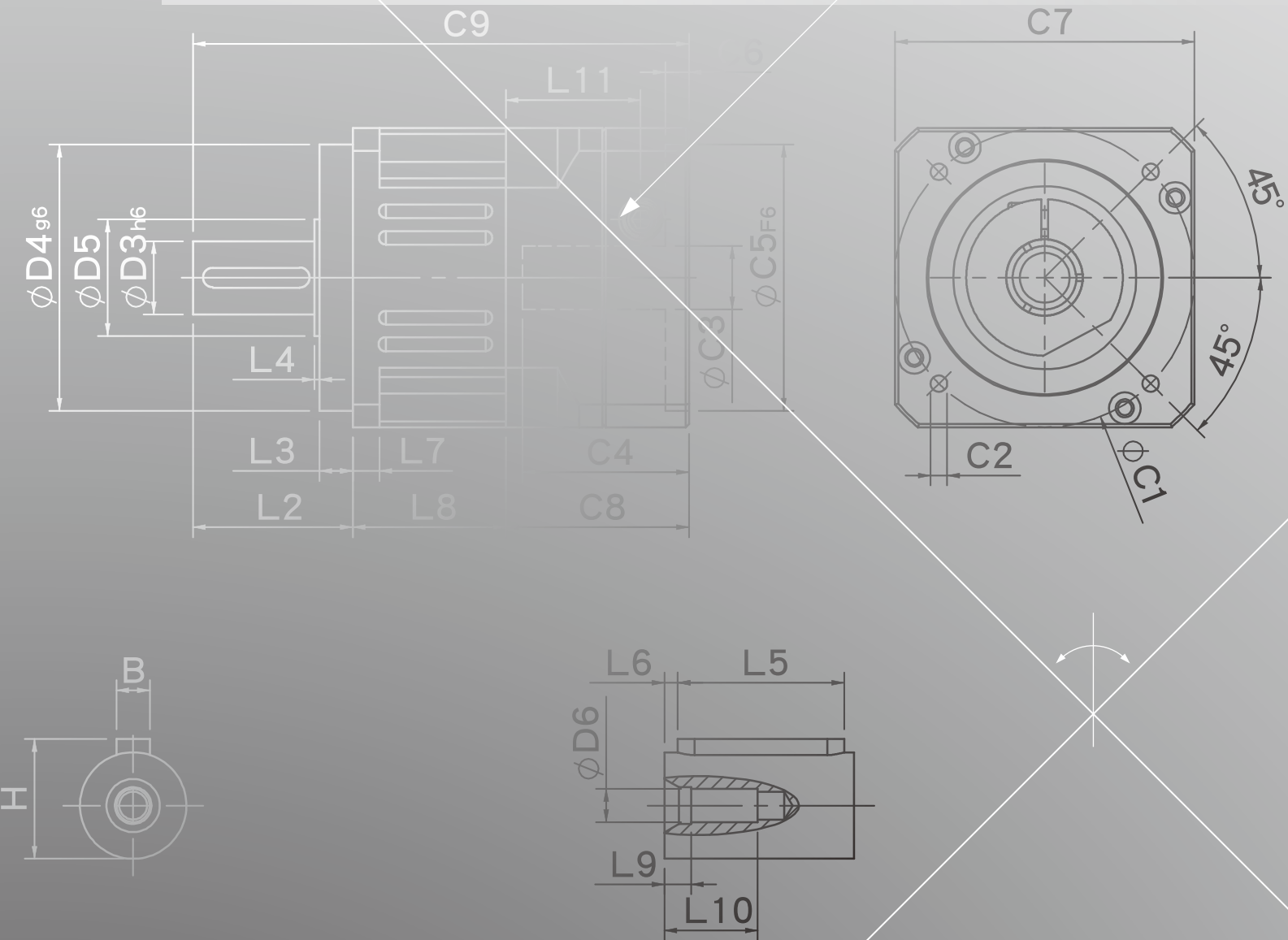
(Eq.5)

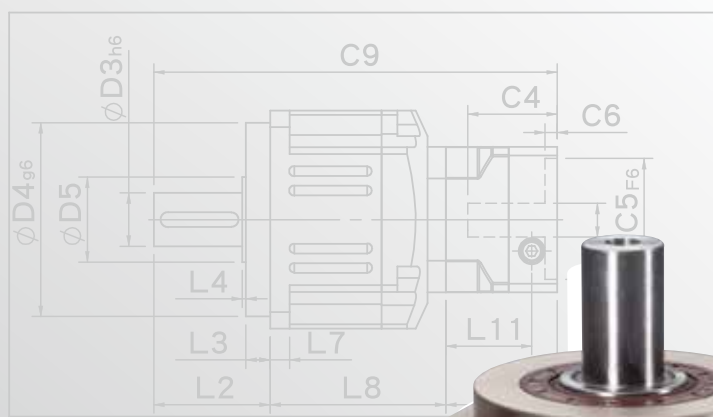
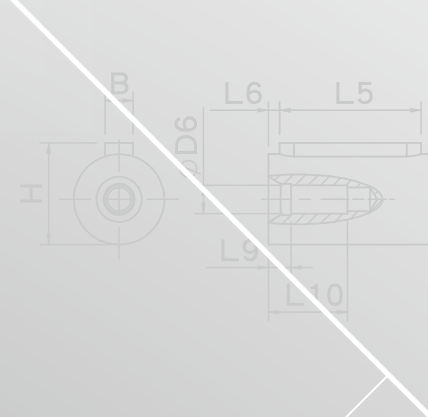
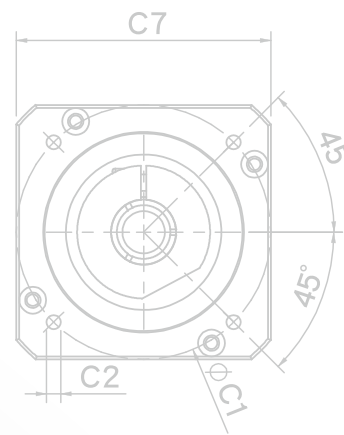
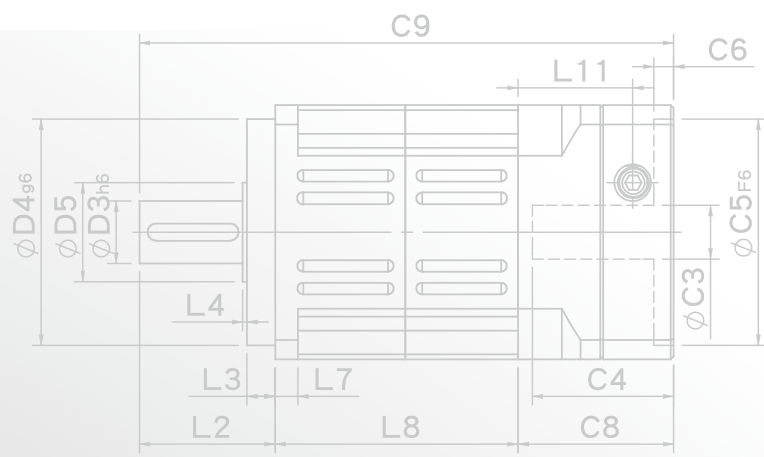
$$6. F_{2m} = 3 \sqrt{\frac{n_{2a} \times t_a \times F_{2ra}^3 + n_{2c} \times t_c \times F_{2rc}^3 + n_{2d} \times t_d \times F_{2rd}^3}{n_{2a} \times t_a + n_{2c} \times t_c + n_{2d} \times t_d}}$$

$$F_{2am} = 3 \sqrt{\frac{n_{2a} \times t_a \times F_{2aa}^3 + n_{2c} \times t_c \times F_{2ac}^3 + n_{2d} \times t_d \times F_{2ad}^3}{n_{2a} \times t_a + n_{2c} \times t_c + n_{2d} \times t_d}}$$

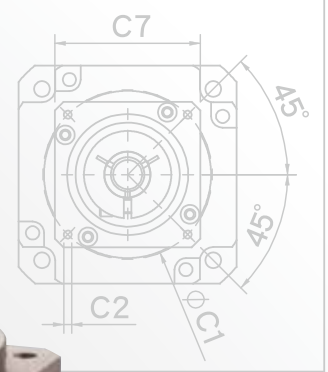
(Eq.6)

PHL SERIES

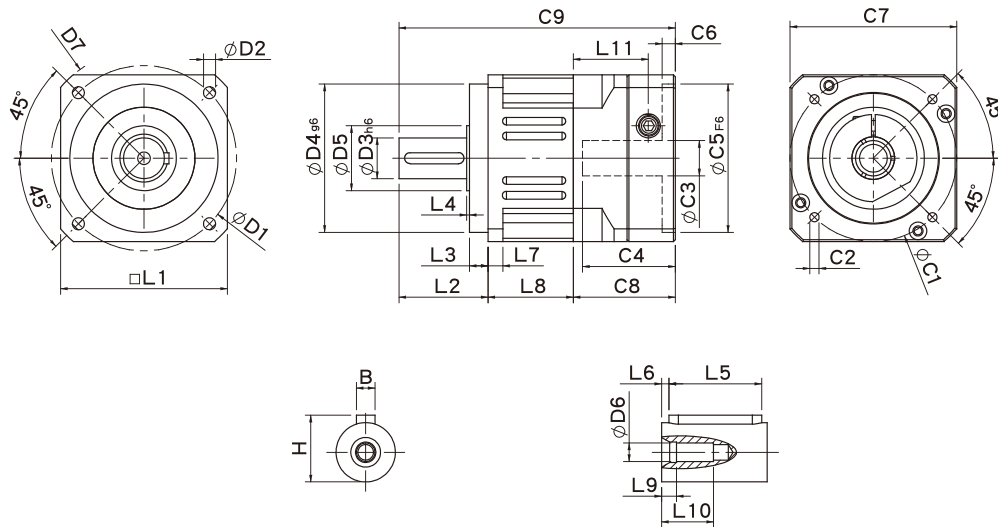




PHL60T/PHL90T/PHL115T



PHL Single Stage Dimensions



Specifications

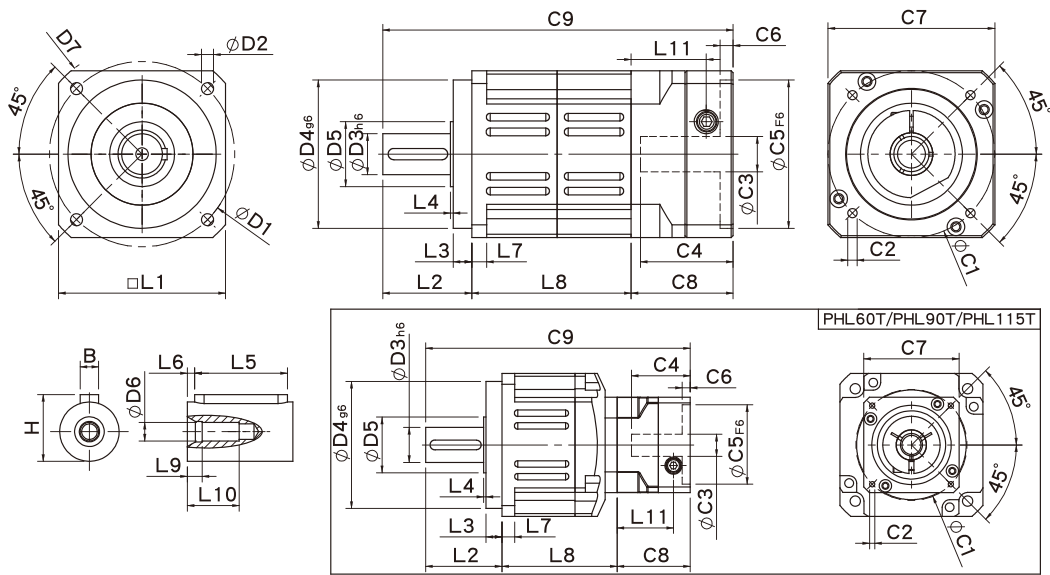
Unit:mm

Dimensions	PHL42	PHL60	PHL90
D1	50	70	100
D2	3.4	5.5	6.5
D3 h6	13	16	22
D4 g6	35	50	80
D5	15	25	35
D6	M4x0.7P	M5x0.8P	M8x1.25P
D7	56	80	118
L1	42.6	60	90
L2	26	37	48
L3	5.5	7	10
L4	1	1.5	1.5
L5	15	25	32
L6	2	2	3
L7	4	6	8
L8	28.3	37	46
L9	4	4	4.5
L10	14	16.5	20.5
L11	29	35.5	40.5
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	≤8/≤11	≤14	≤19/≤24
C4 ²	27	37	47
C5 ² F6	30	50	70
C6 ²	4	4	6
C7 ²	42.6	60	90
C8 ²	38.5	46	55
C9 ²	92.8	120	149
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 h6	13		16		22
D4 g6	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 ²	46	70	46	90	70
C2 ²	M4x0.7P	M5x0.8P	M5x0.8P	M6x1.0P	M5x0.8P
C3 ²	≤8/≤11	≤14	≤8/≤11	≤19/≤24	≤14
C4 ²	27	37	27	47	37
C5 ² F6	30	50	30	70	50
C6 ²	4	4	4	6	4
C7 ²	42.6	60	42.6	90	60
C8 ²	38.5	46	38.5	55	46
C9 ²	119.8	153	141	189	172.5
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 ²	dBA/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 ²		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 at 100 rpm.						
* 2. Measured at 3000 rpm with no load. These values are measured by gearbox with ratio = 10 (1-stage) or ratio = 100 (2-stage) at nominal input speed or 3000 rpm (if nominal input speed is higher than 3000 rpm) with no load.						
※ The above figures/specifications are subject to change without prior notice.						

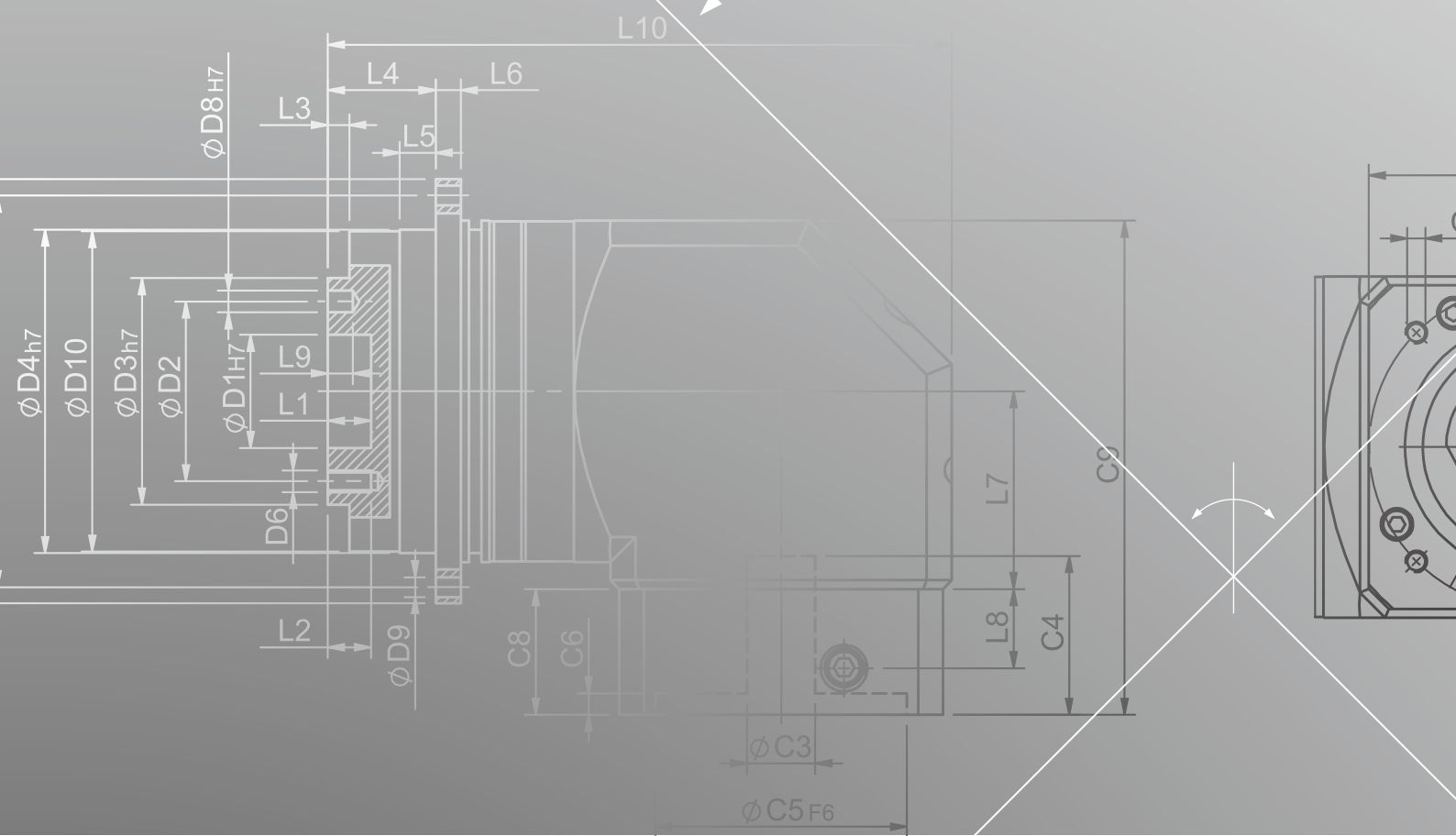
Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

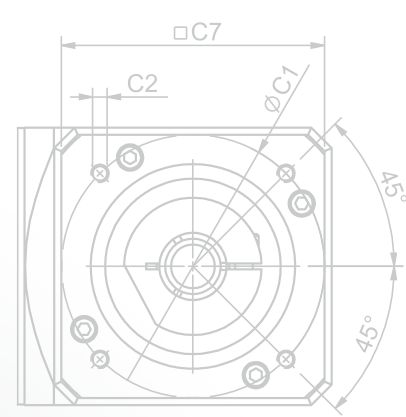
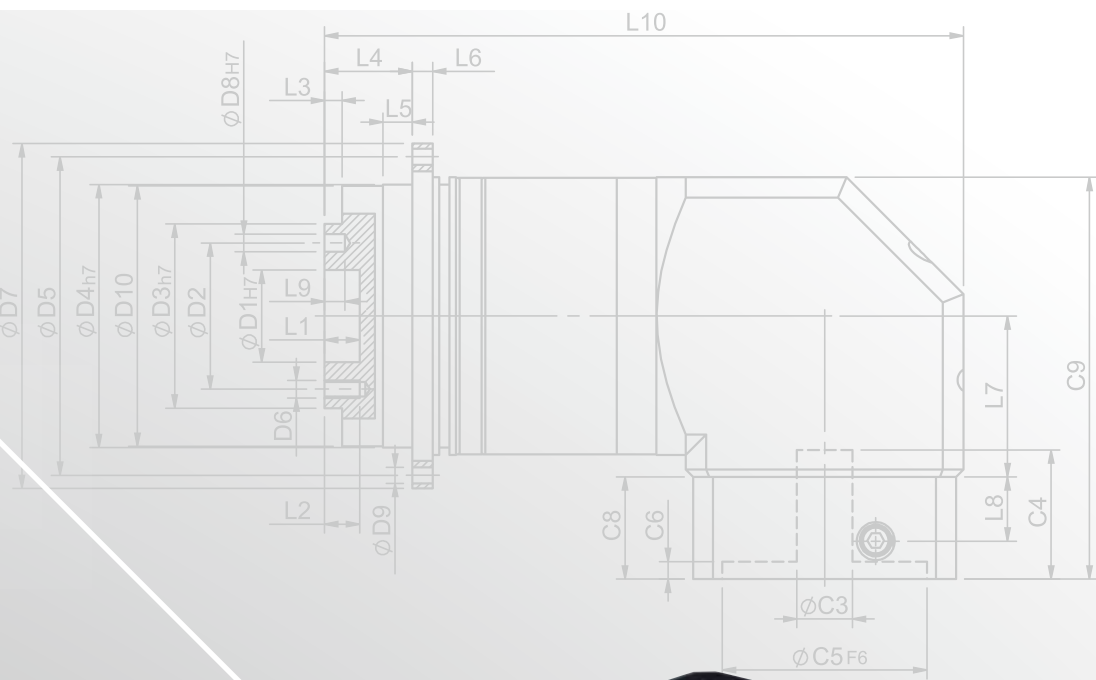
PLANETARY GEARHEADS



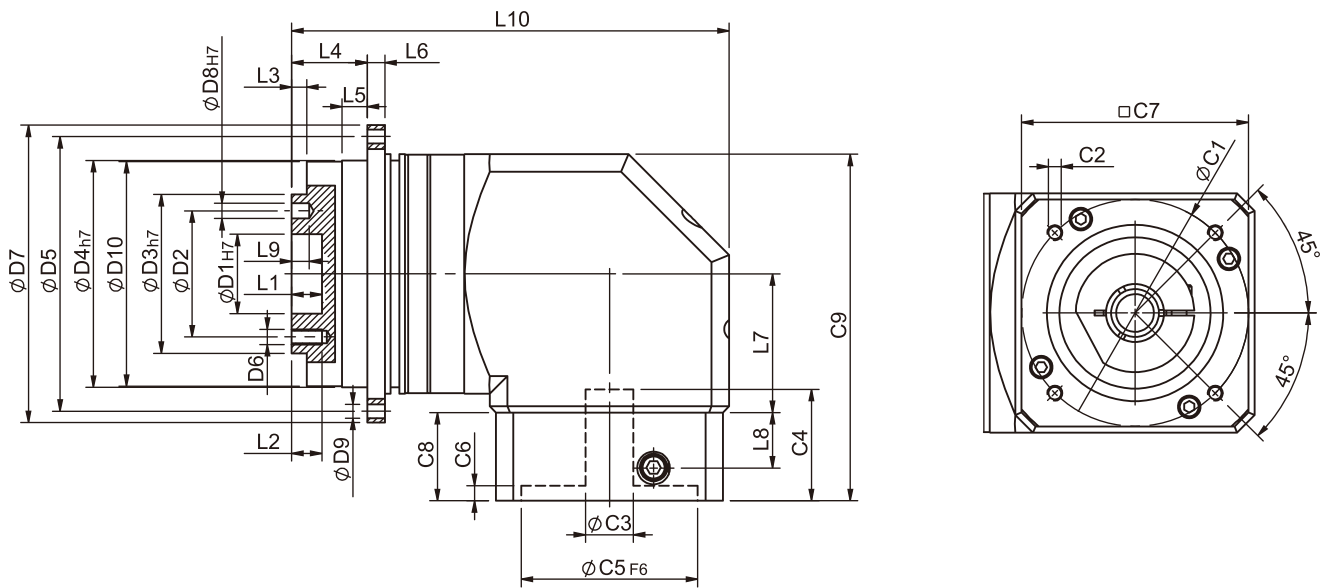
- PHL
- PHFR
- PHF
- PGH
- PUR
- PUL
- PUA
- PGLH
- PGCH
- PGEH
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- PGE
- SGC
- SGE
- PGRH
- PGR
- PGFR
- PGF
- PBC
- PBE
- PAE
- PAC
- PAN
- PGS
- PNS
- PGW

PHFR SERIES





PHFR Single Stage Dimensions



Specifications

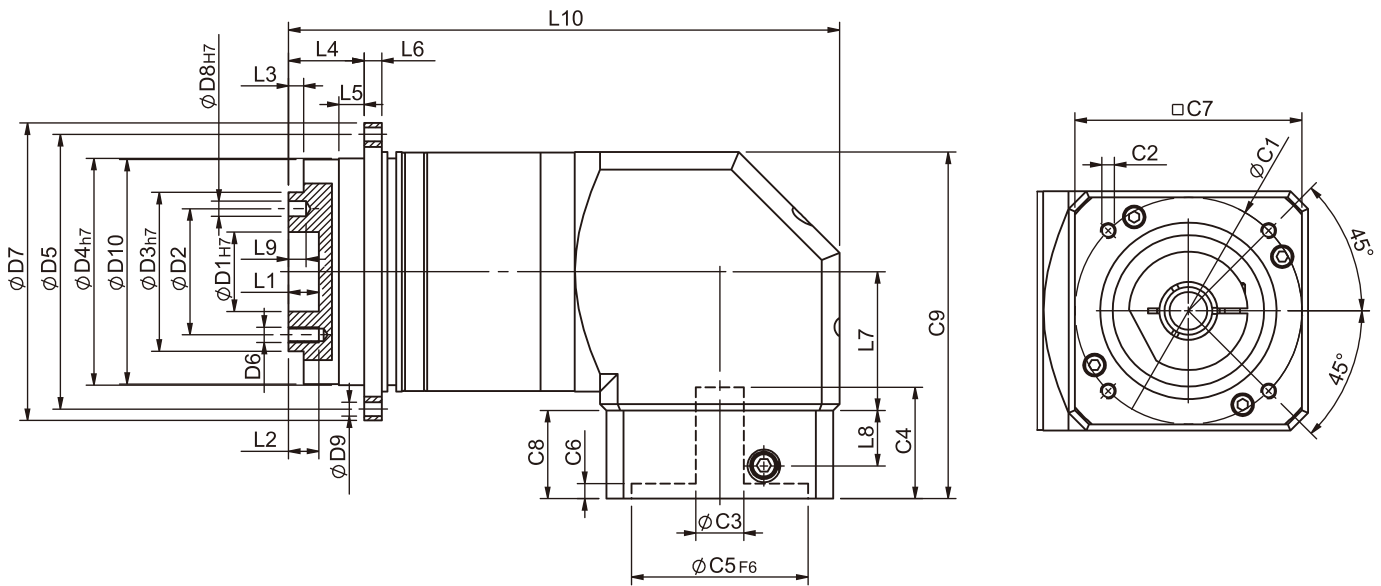
Unit:mm

Dimensions	PHFR42	PHFR60	PHFR90	PHFR115	PHFR142	PHFR200	PHFR255
D1 _{H7}	12	20	31.5	40	50	80	100
D2	20	31.5	50	63	80	125	140
D3 _{h7}	28	40	63	80	100	160	180
D4 _{h7}	47	64	90	110	140	200	255
D5	67	79	109	135	168	233	280
D6	M3x0.5P	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P	M10x1.5P	M16x2.0P
D7	72	86	118	145	179	247	300
D8 _{H7}	3	5	6	6	8	10	12
D9	3.4	4.5	5.5	5.5	6.6	9	13.5
D10	46.2	63.2	89.2	109.2	139.2	199.2	254.2
L1	4	8	12	12	12	16	20
L2	6	7.2	12	13.5	16	22.5	30.5
L3	3	3	6	6	6	8	12
L4	19.5	19.5	30	29	38	50	66
L5	7	7	10	10	14.6	15	20
L6	4	4	7	8	10	12	18
L7	32.2	44.8	55	69	71	92.5	92.5
L8	13.5	21.5	22	32	44.7	44	60
L9	4	6	7	7	7	10	10
L10	92.2	128.3	173.6	204.2	250.7	330.7	392.2
C1 ²	46	70	90	90	145	200	215
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P	M12x1.75P	M12x1.75P
C3 ²	≤8/≤11	≤14/≤19	≤19/≤24	≤24/≤32	≤35	≤50	≤55
C4 ²	29	34	44	53.5	76.8	78.8	98.7
C5 ² _{F6}	30	50	70	70	110	114.3	180
C6 ²	6	5	5	5.5	9	6	6
C7 ²	42.6	60	90	115	140	180	220
C8 ²	25	33	35	48	65	65	85
C9 ²	78.5	112.8	137.5	176.5	225.5	246.5	266.5

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

★ Specification subject to change without notice.

PHFR Double Stage Dimensions-1



Specifications

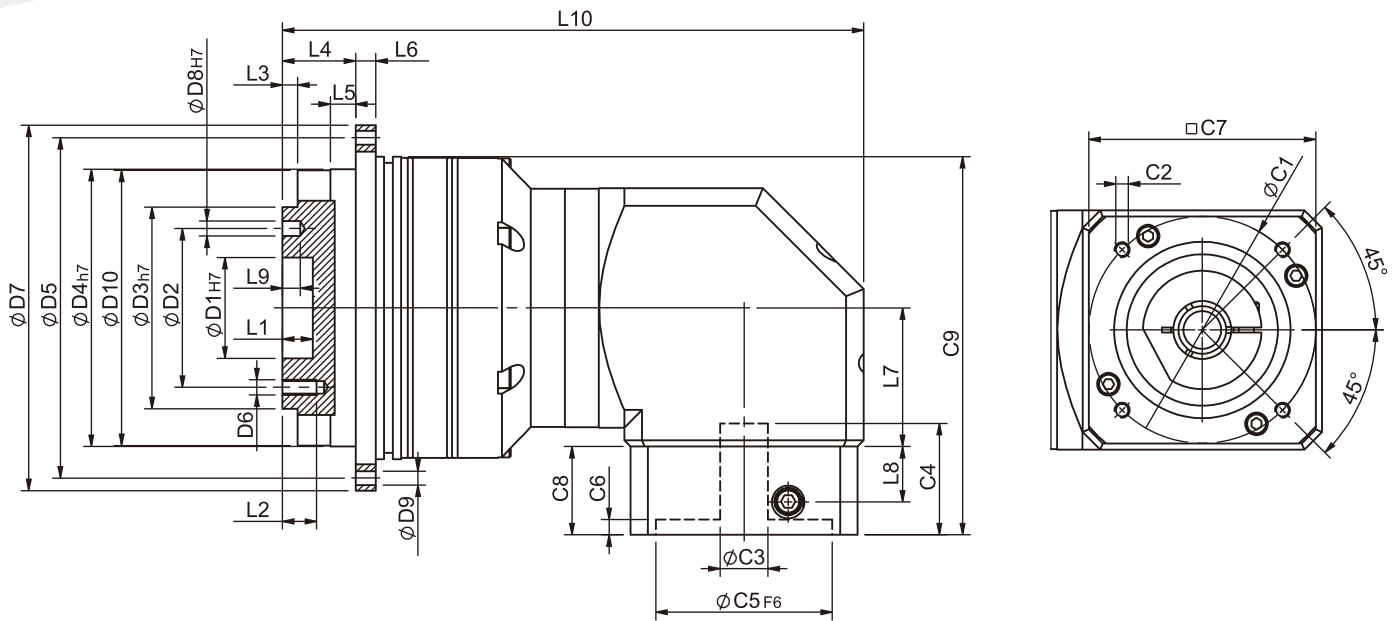
Unit:mm

Dimensions	PHFR42	PHFR60	PHFR90
D1 _{H7}	12	20	31.5
D2	20	31.5	50
D3 _{h7}	28	40	63
D4 _{h7}	47	64	90
D5	67	79	109
D6	M3x0.5P	M5x0.8P	M6x1.0P
D7	72	86	118
D8 _{H7}	3	5	6
D9	3.4	4.5	5.5
D10	46.2	63.2	89.2
L1	4	8	12
L2	6	7.2	12
L3	3	3	6
L4	19.5	19.5	30
L5	7	7	10
L6	4	4	7
L7	32.2	44.8	55
L8	13.5	21.5	22
L9	4	6	7
L10	119.9	163.3	218.6
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	≤8	≤14	≤19/≤24
C4 ²	29	34	44
C5 ² _{F6}	30	50	70
C6 ²	6	5	5
C7 ²	42.6	60	90
C8 ²	25	33	35
C9 ²	78.5	112.8	137.5

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

★ Specification subject to change without notice.

PHFR Double Stage Dimensions-2



Specifications

Unit:mm

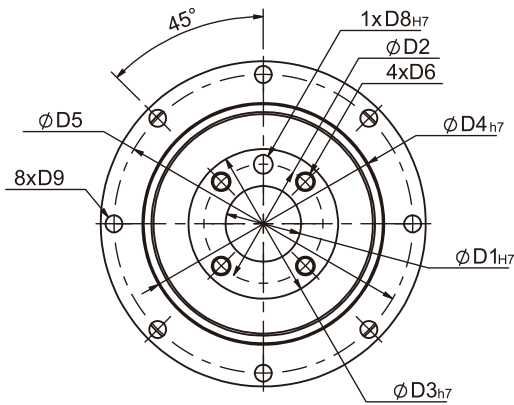
Dimensions	PHFR60T	PHFR90T	PHFR115T	PHFR142T	PHFR200T	PHFR255T
D1 _{H7}	20	31.5	40	50	80	100
D2	31.5	50	63	80	125	140
D3 _{h7}	40	63	80	100	160	180
D4 _{h7}	64	90	110	140	200	255
D5	79	109	135	168	233	280
D6	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P	M10x1.5P	M16x2.0P
D7	86	118	145	179	247	300
D8 _{H7}	5	6	6	8	10	12
D9	4.5	5.5	5.5	6.6	9	13.5
D10	63.2	89.2	109.2	139.2	199.2	254.2
L1	8	12	12	12	16	20
L2	7.2	12	13.5	16	22.5	30.5
L3	3	6	6	6	8	12
L4	19.5	30	29	38	50	66
L5	7	10	10	14.6	15	20
L6	4	7	8	10	12	18
L7	32.2	44.8	55	69	71	92.5
L8	13.5	21.5	22	32	44.7	44
L9	6	7	7	7	10	10
L10	130.6	173.8	230.6	270.7	361.4	439.2
C1 ²	46	70	90	90	145	200
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P	M12x1.75P
C3 ²	≤8/≤11	≤14/≤19	≤19/≤24	≤24/≤32	≤35	≤50
C4 ²	29	34	44	53.5	76.8	78.8
C5 ² _{F6}	30	50	70	70	110	114.3
C6 ²	6	5	5	5.5	9	6
C7 ²	42.6	60	90	115	140	92.5
C8 ²	25	33	35	48	65	65
C9 ²	84.4	125.3	150	176.5	259.5	284

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

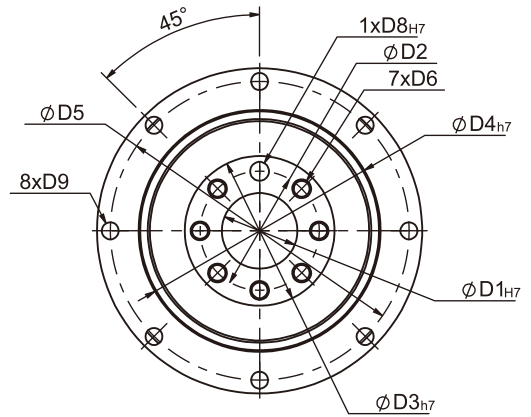
★ Specification subject to change without notice.

PHFR Flange Dimensions

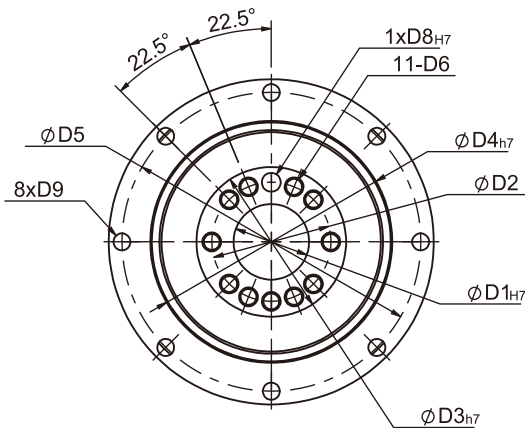
PHFR42



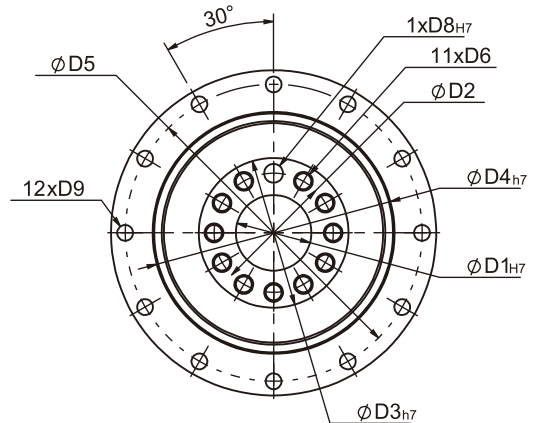
PHFR60 PHFR90



PHFR115



PHFR142 PHFR200



Specifications

Unit:mm

Dimensions	PHFR42	PHFR60	PHFR90	PHFR115	PHFR142	PHFR200
D1 _{H7}	12	20	31.5	40	50	80
D2	20	31.5	50	63	80	125
D3 _{h7}	28	40	63	80	100	160
D4 _{h7}	47	64	90	110	140	200
D5	67	79	109	135	168	233
D6	M3x0.5P	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P	M10x1.5P
D8 _{H7}	3	5	6	6	8	10
D9	3.4	4.5	5.5	5.5	6.6	9

★ Specification subject to change without notice.

PHFR Specifications Table

Specifications		Stage	Ratio	PHFR-42	PHFR-60	PHFR-90	PHFR-115	PHFR-142	PHFR-200	PHFR-255
Nominal Output Torque T_{2N}	N • m	1	3	-	40	105	180	340	580	950
			4	16	43	110	240	500	1100	1500
			5	17	50	130	290	600	1200	1800
			7	14	44	125	270	530	1100	1750
			10	17	50	130	260	540	900	1500
			14	14	44	125	270	530	1100	1750
		20	11	37	95	220	430	900	1450	
		Stage	Ratio	PHFR-42	PHFR-60 (T)	PHFR-90(T)	PHFR-115T	PHFR-142T	PHFR-200T	PHFR-255T
		2	15	-	40	105	180	600	1200	2000
			20	16	43	110	240	600	1200	2000
			25	17	50	130	290	600	1200	2000
			30	17	40	105	180	600	1200	2000
			35	17	50	130	290	600	1200	2000
			40	16	43	110	240	600	1200	2000
			50	17	50	130	290	600	1200	2000
			70	14	44	125	270	530	1100	1750
			100	11	37	95	220	430	900	1450
			140	14	44	125	270	530	1100	1750
200	11	37	95	220	430	900	1450			
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	3-200	5000	5000	4000	4000	3000	3000	2000
Max. Input Speed n_{1max}	rpm	1,2	3-200	10000	10000	8000	8000	6000	6000	4000
Micro Backlash P0	arcmin	1	3-20	-	-	≤ 3	≤ 2	≤ 2	≤ 2	≤ 2
		2	15-200	-	-	≤ 5	≤ 4	≤ 4	≤ 4	≤ 4
Precision Backlash P1	arcmin	1	3-20	≤ 5	≤ 5	≤ 5	≤ 4	≤ 4	≤ 4	≤ 4
		2	15-200	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
Standard Backlash P2	arcmin	1	3-20	≤ 7	≤ 7	≤ 7	≤ 6	≤ 6	≤ 6	≤ 6
		2	15-200	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
Torsional Rigidity	N • m / arcmin	1,2	3-200	6	12	30	80	150	450	1000
Max. Bending Moment M_{2kB}^1	N • m	1,2	3-200	43	125	288	503	1470	2950	6500
Max. Axial Load F_{2aB}^1	N	1,2	3-200	1015	1340	2868	3890	9850	12560	21850
Operating Temp.	°C		3-200	-10 °C ~ +90 °C						
Service Life	hr		3-200	20,000 (10,000 Continuous operation)						
Efficiency	%	1	3-20	≥ 95%						
		2	15-200	≥ 92%						
Weight	kg	1	3-20	1.1	2.3	6.6	13.5	25.1	50	85
		2	15-200	1.6	3.2/2.2	8.6/5.3	14.8	26.7	55	88
Mounting Position	-	1,2	3-200	Any direction						
Noise Level ²	dBA/1m	1,2	3-200	62	64	66	68	70	72	74
Protection Class	-	1,2	3-200	IP65						
Lubrication	-	1,2	3-200	Synthetic Lubricant						
Inertia (J1)										
Stage	Ratio	unit		PHFR-42	PHFR-60	PHFR-90	PHFR-115	PHFR-142	PHFR-200	PHFR-255
1	3/4/5/7/9	Kg • cm ²		0.06	0.40	2.28	6.87	24.2	69.8	138.2
	10/14/20			0.05	0.30	1.45	4.76	14.5	50.3	103.6
Stage	Ratio			PHFR-42	PHFR-60(T)	PHFR-90(T)	PHFR-115T	PHFR-142T	PHFR-200T	PHFR-255T
2	15/20/25/35			0.06	0.40(0.08)	2.28(0.72)	3.02	7.83	27.7	80.3
	others			0.05	0.30(0.06)	1.45(0.38)	1.64	5.00	15.9	55.3

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

* 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.

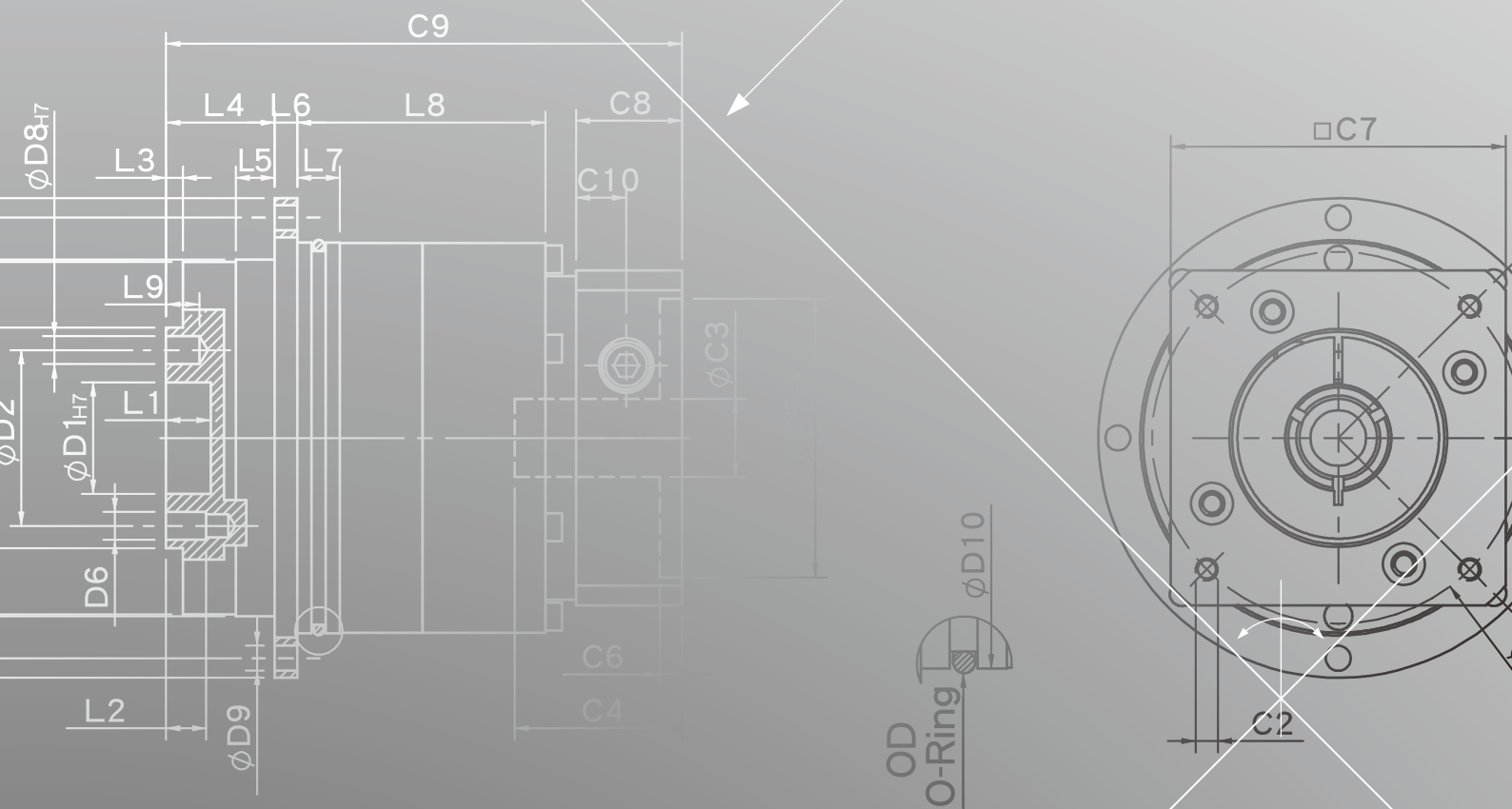
Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

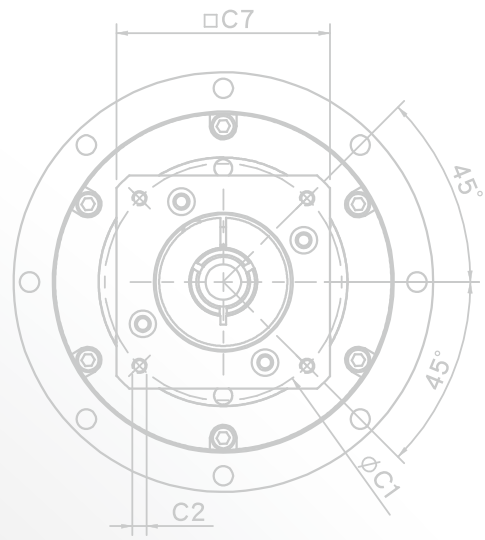
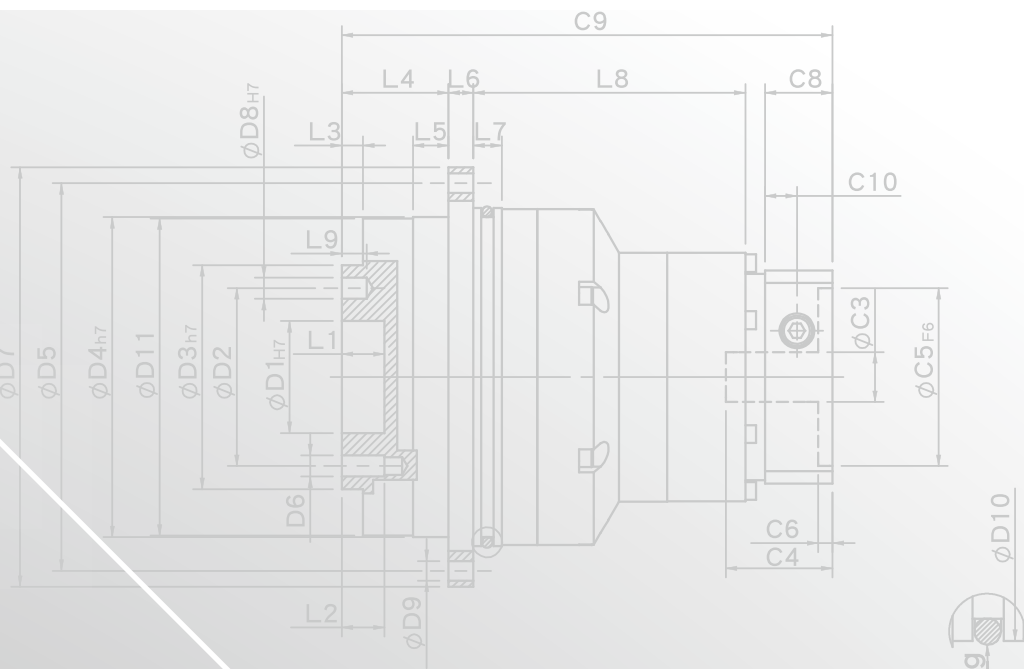
PLANETARY GEARHEADS



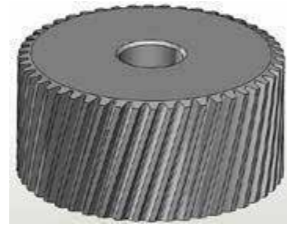
PHL PHFR PHF PGH PUR PUL PUA PGLH PGCH PGEH PGSH PGL PGC PGE SGC SGE PGRH PGR PGFR PGF PBC PBE PAE PAC PAN PGS PNS PGW

PHF SERIES

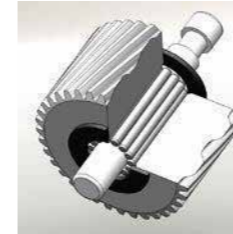




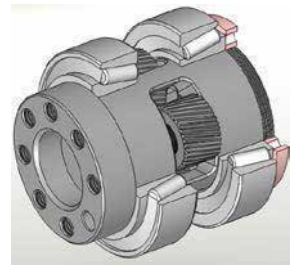
PHF SERIES FEATURES



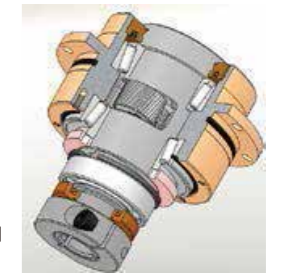
Alloy steel gear with unique heat treatment. Additionally, with gear grinding process-ing to get the best accuracy, high wear resistance and high impact toughness.



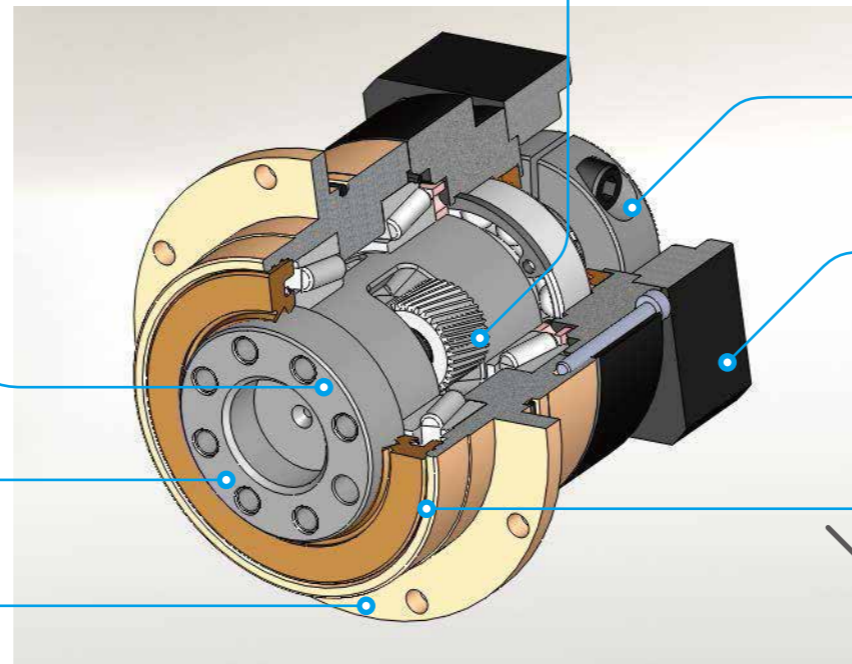
Planet gear transmission interface equipped with needle bearings, full needle roller bearings aligned without retainer achieve maximum exposure but smallest gap tolerances. Enhance over-all gear structure rigid and output torque.



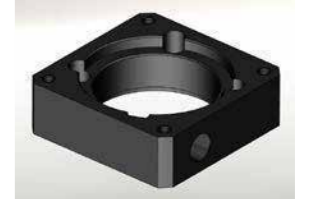
Planetary arm bracket and output shaft are one-piece constructed, using tapered roller bearings can bear the axial load and radial load that are more than deep groove ball bearings. Setting the bearing apart for larger span to reach the largest torsional rigidity and contribute high axial load and radial load capacity.



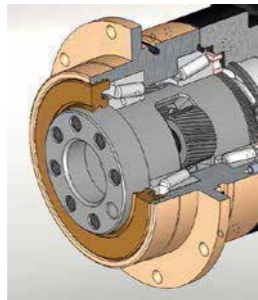
Input-end and motor shaft are coupled through a dynamic balanced collar clamping mechanism to ensure connection interface concentricity and zero slip power transmission at high speed.



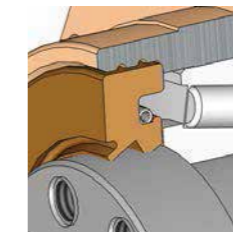
Advanced motor bracket design coupled with the input shaft bushing is easy to mount to any servo or stepper motor.



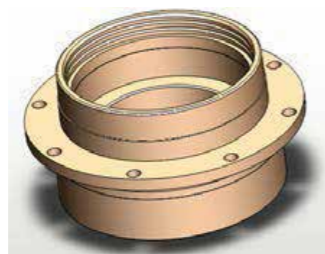
Grinding process to smooth surface of output shaft, and with oil seal to minimum friction coefficient and reducing start up load; result in the best seal-ability and extended lifespan. Hollow out-put shaft connect perfectly with circular flange drastically reducing the installation space.



PHF series overall design suitable for combination operation with servo motor high-speed input and achieves maximum torque output. Hollow out-put shaft connects perfectly with circular flange drastically reducing the installation space. Precision helical gear design and gear processing create a planetary gearhead with low backlash operation, high efficiency, low noise and long lifespan.



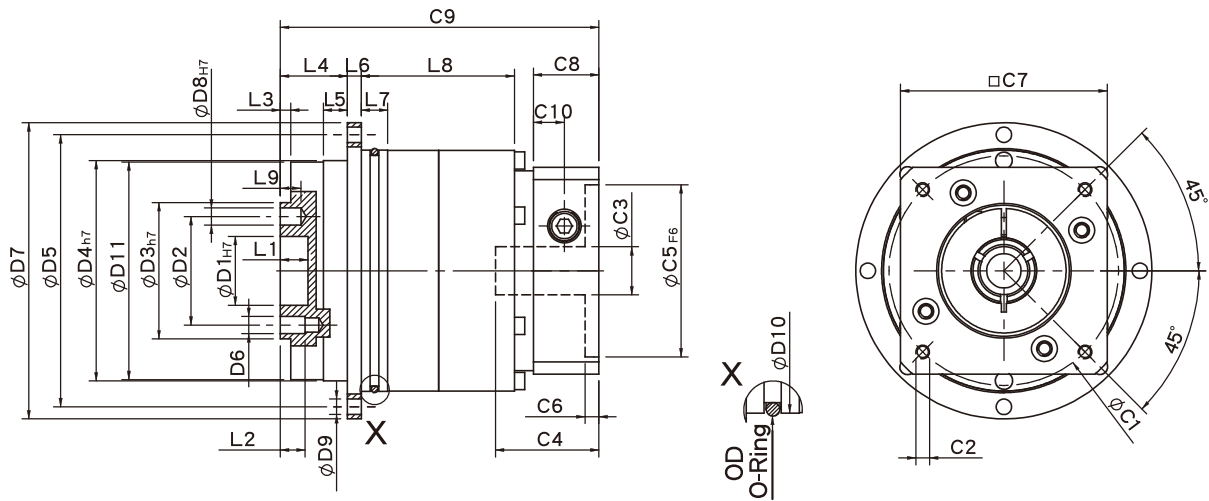
High-tech oil seal design on the upper lip guard against dust intruder, lower lip to guard against oil leak. Protection grade IP65 safeguards fully avoid leaking problem, and given it maintenance-free.



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.

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

PHF Single Stage Dimensions



Specifications

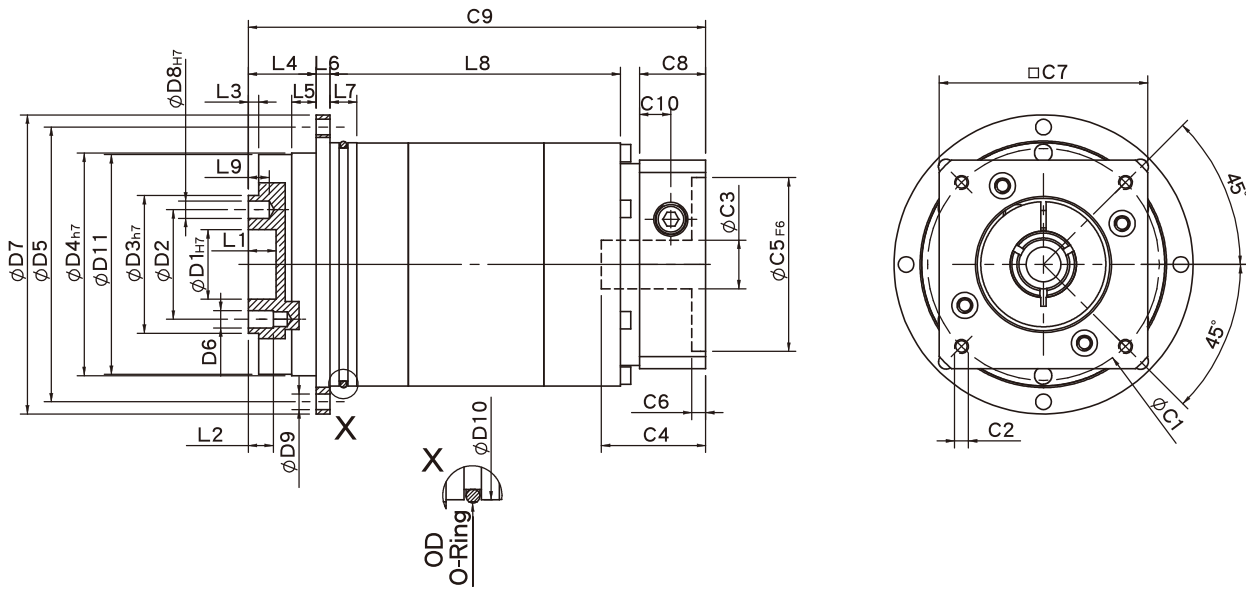
Unit:mm

Dimensions	PHF42	PHF60	PHF90	PHF115	PHF142	PHF200	PHF255
D1 _{H7}	12	20	31.5	40	50	80	100
D2	20	31.5	50	63	80	125	140
D3 _{H7}	28	40	63	80	100	160	180
D4 _{H7}	47	64	90	110	140	200	255
D5	67	79	109	135	168	233	280
D6	M3x0.5P	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P	M10x1.5P	M16x2.0P
D7	72	86	118	145	179	247	300
D8 _{H7}	3	5	6	6	8	10	12
D9	3.4	4.5	5.5	5.5	6.6	9	13.5
D10	60	70	95	120	152	212	255
D11	46.2	63.2	89.2	109.2	139.2	199.2	254.2
L1	4	8	12	12	12	12	20
L2	6	7.2	12	13.5	16	22.5	30.5
L3	3	3	6	6	6	8	12
L4	19.5	19.5	30	29	38	50	66
L5	7	7	10	10	14.6	15	20
L6	4	4	7	8	10	12	18
L7	5	7.7	8	10	12	17	39.5
L8	25	37.5	36.5	54.5	65	92	118
L9	4	6	7	7	7	10	10
C1 ²	46	70	90	115	145	200	235
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P	M12x1.75P
C3 ²	≤8/≤11	≤14/≤19	≤19/≤24	≤24/≤32/≤38	≤35/≤38	≤50	≤55
C4 ²	28.1	36.5	41.2	51.1	69.7	81	112
C5 ² _{F6}	30	50	70	95	110	114.3	200
C6 ²	4	4	6.7	6	8.5	6	6
C7 ²	42	60	90	115	140	182	220
C8 ²	16.5	19	25.5	30	38	40	50
C9 ²	74.8	92.5	107	131.5	171.5	215	271
C10 ²	7.4	9	11.3	13.9	17.8	21	21
OD	56x2	66x2	90x3	110x3	145x3	200x5	238x5

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

★ Specification subject to change without notice.

PHF Double Stage Dimensions-1



Specifications

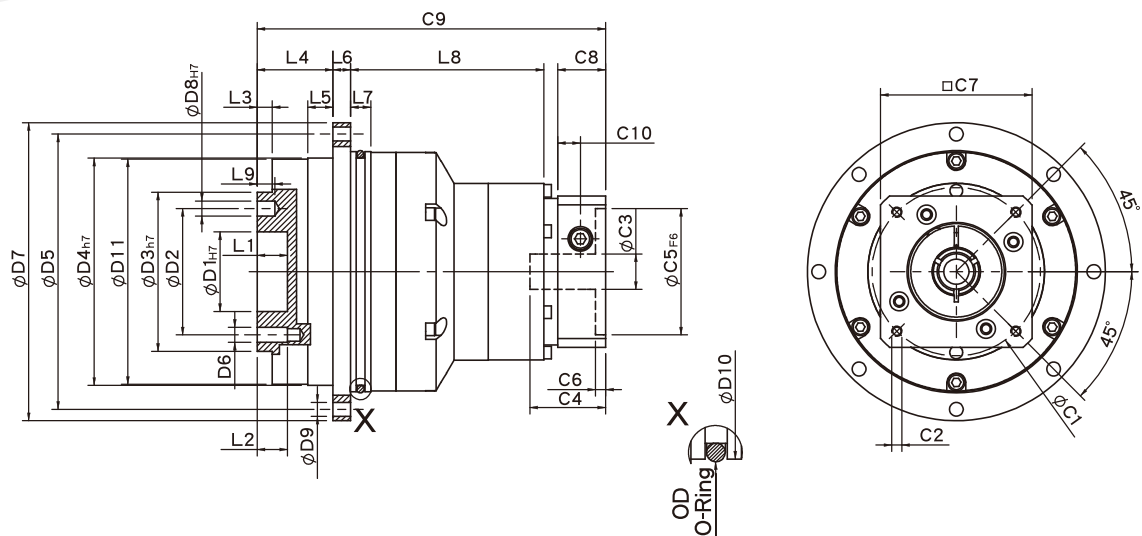
Unit:mm

Dimensions	PHF42	PHF60	PHF90
D1 _{H7}	12	20	31.5
D2	20	31.5	50
D3 _{h7}	28	40	63
D4 _{h7}	47	64	90
D5	67	79	109
D6	M3x0.5P	M5x0.8P	M6x1.0P
D7	72	86	118
D8 _{H7}	3	5	6
D9	3.4	4.5	5.5
D10	60	70	95
D11	46.2	63.2	89.2
L1	4	8	12
L2	6	7.2	12
L3	3	3	6
L4	19.5	19.5	30
L5	7	7	10
L6	4	4	7
L7	5	7.7	8
L8	54.5	72.5	81.5
L9	4	6	7
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	≤8/≤11	≤14/≤19	≤19/≤24
C4 ²	28.1	36.4	41.2
C5 ² _{F6}	30	50	70
C6 ²	4	4	6.7
C7 ²	42	60	90
C8 ²	16.5	19	25.5
C9 ²	102.5	127.5	151.1
C10 ²	7.4	9	11.3
OD	56x2	66x2	90x3

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

* Specification subject to change without notice.

PHF Double Stage Dimensions-2



Specifications

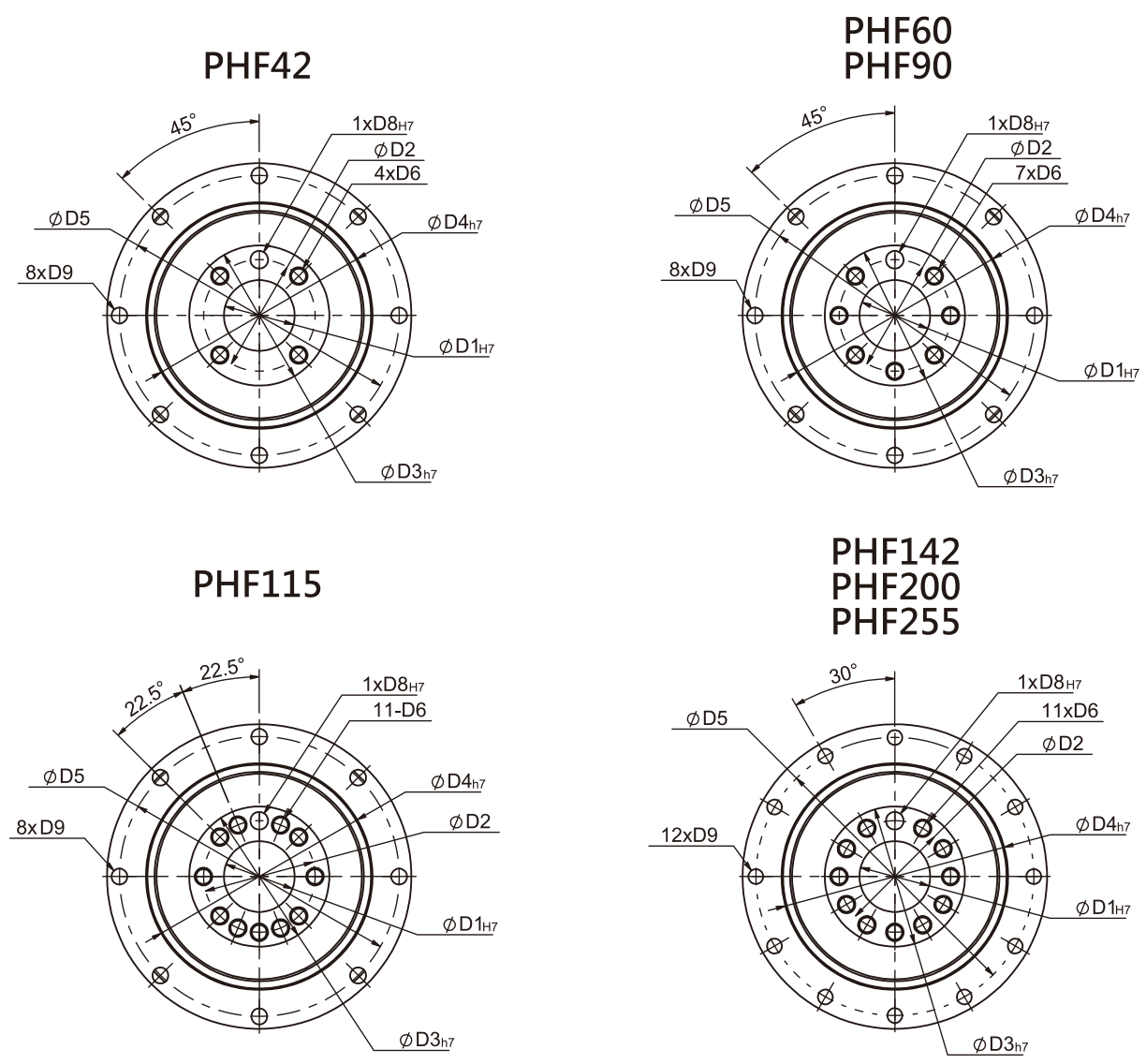
Unit:mm

Dimensions	PHF60T	PHF90T	PHF115T	PHF142T	PHF200T	PHF255T
D1 _{H7}	20	31.5	40	50	80	100
D2	31.5	50	63	80	125	140
D3 _{h7}	40	63	80	100	160	180
D4 _{h7}	64	90	110	140	200	255
D5	79	109	135	168	233	280
D6	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P	M10x1.5P	M16x2.0P
D7	86	118	145	179	247	300
D8 _{H7}	5	6	6	8	10	12
D9	4.5	5.5	5.5	6.6	9	13.5
D10	70	95	120	152	212	255
D11	63.2	89.2	109.2	139.2	199.2	254.2
L1	8	12	12	12	12	20
L2	7.2	12	13.5	16	22.5	30.5
L3	3	6	6	6	8	12
L4	19.5	30	29	38	50	66
L5	7	10	10	14.6	15	20
L6	4	7	8	10	12	18
L7	7.7	8	10	12	17	39.5
L8	65.2	69.5	93.5	110	161.7	192
L9	6	7	7	7	10	10
C1 ²	46	70	90	115	145	200
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 ²	≤8/≤11	≤14/≤19	≤19/≤24	≤24/≤32/≤38	≤35/≤38	≤50
C4 ²	28.1	36.5	41.2	51.1	69.7	81
C5 ² _{F6}	30	50	70	95	110	114.3
C6 ²	4	4	6.7	6	8.5	6
C7 ²	42	60	90	115	140	180
C8 ²	16.5	19	25.5	30	38	40
C9 ²	113.2	138	163.1	198	281	335
C10 ²	7.4	9	11.3	13.9	17.8	21
OD	66x2	90x3	110x3	145x3	200x5	238x5

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

★ Specification subject to change without notice.

PHF Flange Dimensions



Specifications

Unit:mm

Dimensions	PHF42	PHF60	PHF90	PHF115	PHF142	PHF200	PHF255
D1 H7	12	20	31.5	40	50	80	100
D2	20	31.5	50	63	80	125	140
D3 h7	28	40	63	80	100	160	180
D4 h7	47	64	90	110	140	200	255
D5	67	79	109	135	168	233	280
D6	M3x0.5P	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P	M10x1.5P	M16x2.0P
D8 H7	3	5	6	6	8	10	12
D9	3.4	4.5	5.5	5.5	6.6	9	13.5

★ Specification subject to change without notice.

PHF Specifications Table

Specifications		Stage	Ratio	PHF-42	PHF-60	PHF-90	PHF-115	PHF-142	PHF-200	PHF-255
Nominal Output Torque T_{2N}	N • m	1	3	-	40	105	180	340	580	1100
			4	16	43	110	240	500	1100	1700
			5	17	50	130	290	600	1200	2000
			7	14	44	125	270	530	1100	1750
			10	11	37	95	220	430	900	1450
		Stage	Ratio	PHF-42	PHF-60 (T)	PHF-90(T)	PHF-115T	PHF-142T	PHF-200T	PHF-255T
		2	15	-	40	105	180	600	1200	2000
			20	16	43	110	240	600	1200	2000
			25	17	50	130	290	600	1200	2000
			30	17	50	130	290	600	1200	2000
			35	17	50	130	290	600	1200	2000
			40	17	50	130	290	600	1200	2000
			50	17	50	130	290	600	1200	2000
			70	14	44	125	270	530	1100	1750
100	11	37	95	220	430	900	1450			
Emergency Stop 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	5000	4000
Micro Backlash P0	arcmin	1	3-10	≤ 2	≤ 2	≤ 2	≤ 1	≤ 1	≤ 1	≤ 1
		2	12-100	≤ 4	≤ 4	≤ 4	≤ 3	≤ 3	≤ 3	≤ 3
Precision Backlash P1	arcmin	1	3-10	≤ 4	≤ 4	≤ 4	≤ 3	≤ 3	≤ 3	≤ 3
		2	12-100	≤ 6	≤ 6	≤ 6	≤ 5	≤ 5	≤ 5	≤ 5
Standard Backlash P2	arcmin	1	3-10	≤ 6	≤ 6	≤ 6	≤ 5	≤ 5	≤ 5	≤ 5
		2	12-100	≤ 8	≤ 8	≤ 8	≤ 7	≤ 7	≤ 7	≤ 7
Torsional Rigidity	N • m /arcmin	1,2	3-100	6	12	30	80	150	450	1000
Max. Bending Moment M_{2kB}^1	N • m	1,2	3-100	43	125	288	503	1470	2950	6080
Max. Axial Load F_{2aB}^1	N	1,2	3-100	1015	1340	2868	3890	9850	12560	21850
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	0.7	1.5	3.3	6.2	13.6	32.1	63.3
		2	12-100	1.1	2.3(1.8)	6.0(4.1)	8.1	17.9	38.6	79.5
Mounting Position	-	1,2	3-100	Any direction						
Noise Level ²	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		PHF-42	PHF-60	PHF-90	PHF-115	PHF-142	PHF-200	PHF-255
1	3	Kg • cm ²		-	0.19	0.72	2.35	9.05	29.80	72.50
	4			0.02	0.18	0.67	1.66	7.17	25.86	58.21
	5			0.02	0.17	0.65	1.50	6.52	23.63	54.36
	7			0.02	0.14	0.60	1.45	6.17	22.92	54.12
	10			0.02	0.14	0.58	1.41	6.10	22.73	53.98
Stage	Ratio			PHF-42	PHF-60(T)	PHF-90(T)	PHF-115T	PHF-142T	PHF-200T	PHF-255T
2	15/20			0.02	0.17(0.02)	0.65(0.17)	0.65	2.35	9.05	29.8
	25/30/35/40			0.02	0.14(0.02)	0.60(0.14)	0.60	1.45	6.17	22.92
	50/70/100			0.02	0.14(0.02)	0.58(0.14)	0.58	1.41	6.10	22.73

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

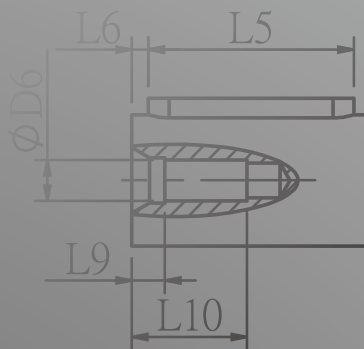
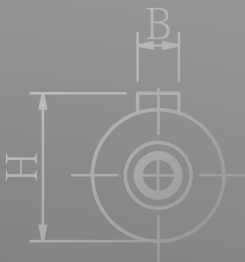
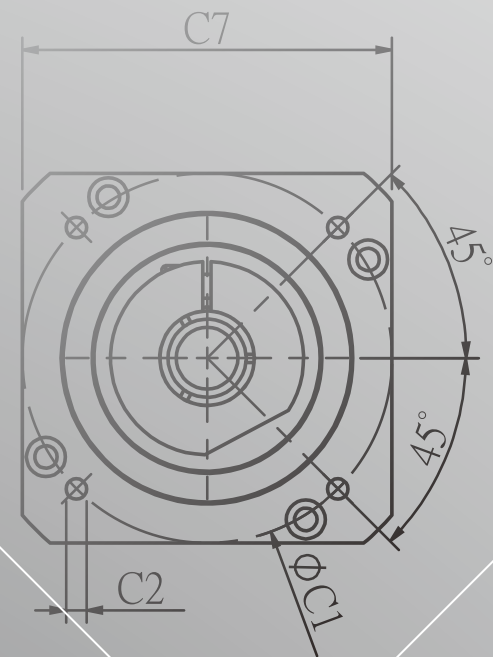
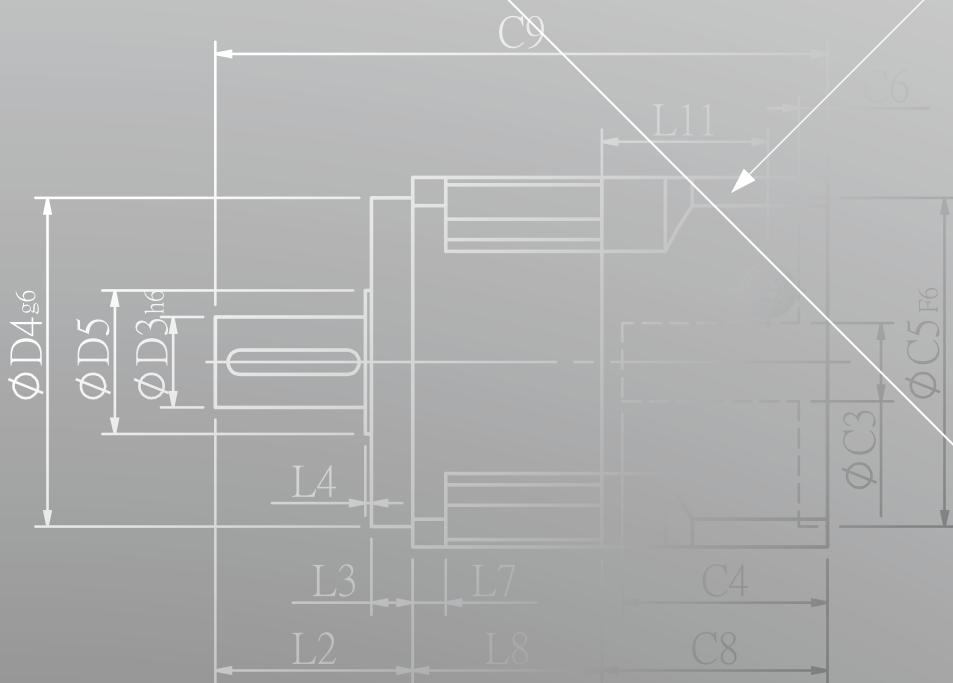
Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

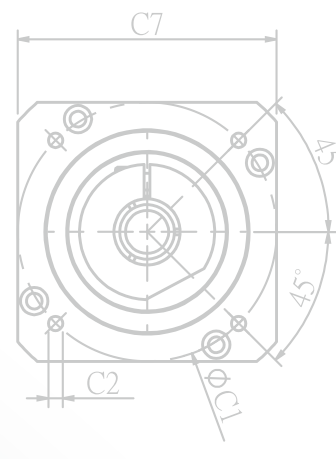
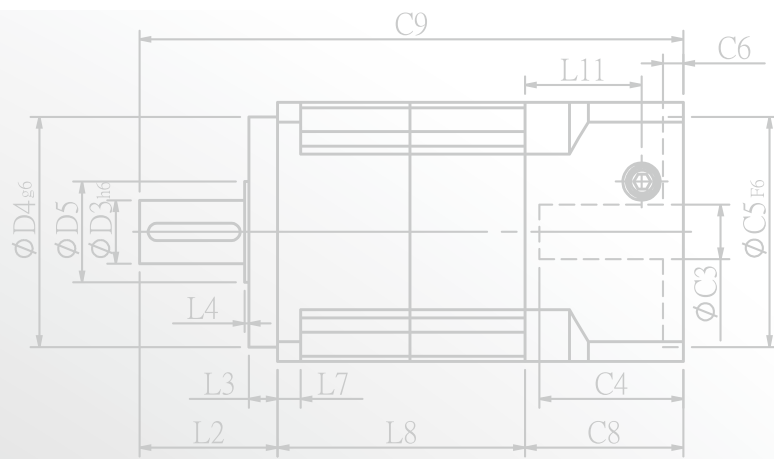
PLANETARY GEARHEADS



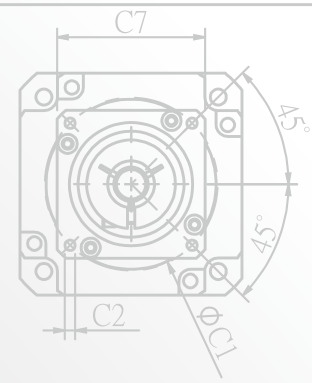
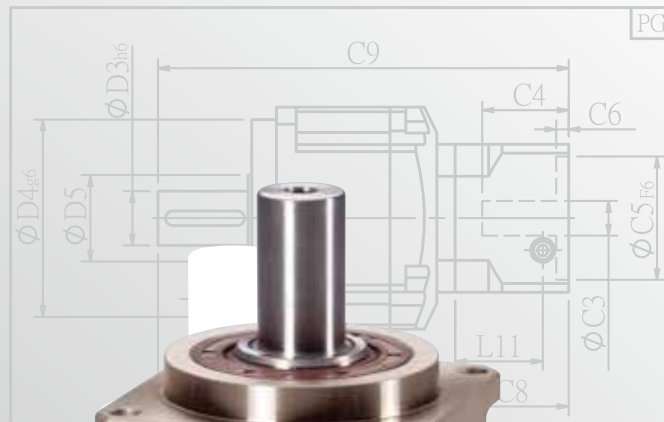
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PGH SERIES

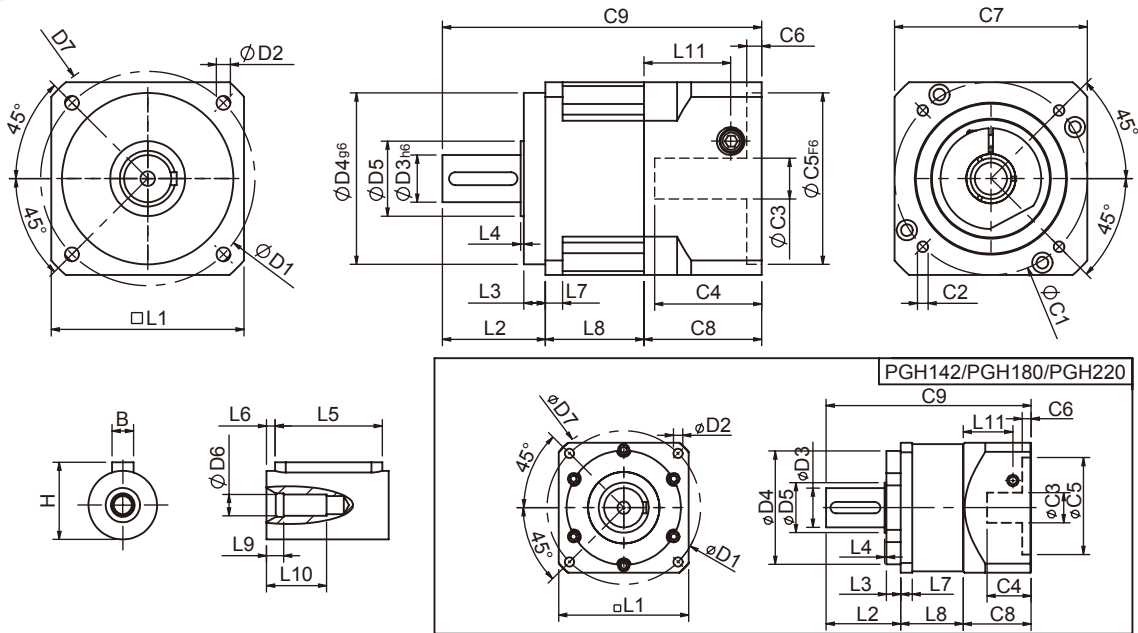




PGH60T/PGH90T/PGH115T/PGH142T/PGH180T



PGH Single Stage Dimensions



Specifications

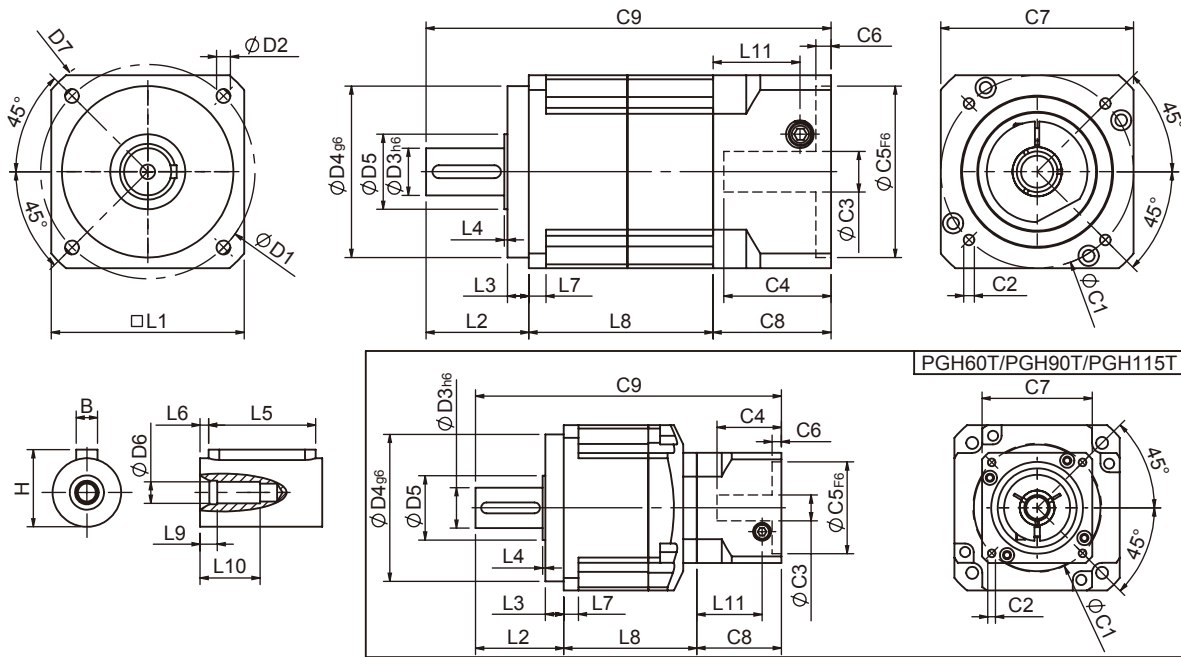
Unit:mm

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

★ Specification subject to change without notice.

PGH Double Stage Dimensions-1



Specifications

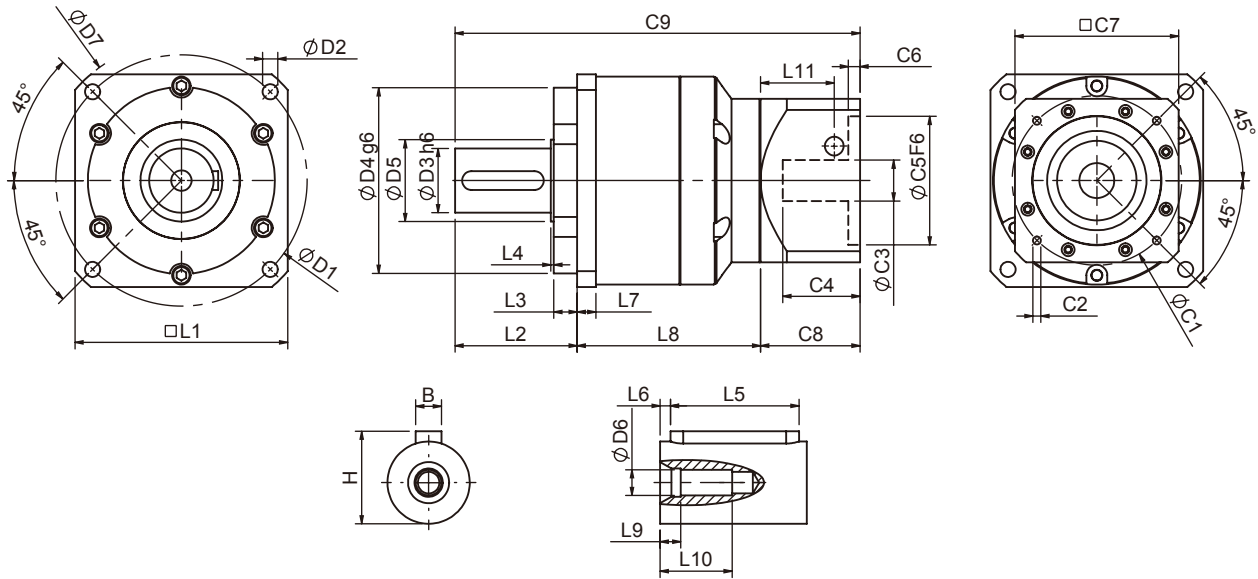
Unit:mm

Dimensions	PGH42	PGH60	PGH60T	PGH90	PGH90T	PGH115T
D1	50		70		100	130
D2	3.4		5.5		6.5	8.5
D3 _{h6}	13		16		22	32
D4 _{g6}	35		50		80	110
D5	15		25		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	63
L3	5.5		7		10	10
L4	1		1.5		1.5	3.5
L5	15		25		32	40
L6	2		2		3	5
L7	4		6		8	11
L8	55.3	70	65.5	86	78.5	99.5
L9	4		4		4.5	6
L10	14		16.5		20.5	30
L11	29	35.5	29	40.5	35.5	40.5
C1 ²	46	70	46	90	70	90
C2 ²	M4x0.7P	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P	M6x1.0P
C3 ²	≤8/≤11	≤14/≤19	≤8/≤11	≤19/≤24	≤14	≤19/≤24
C4 ²	27	37	27	47	37	47
C5 ² _{F6}	30	50	30	70	50	70
C6 ²	4	4	4	6	4	6
C7 ²	42.6	60	42.6	90	60	90
C8 ²	38.5	46	38.5	55	46	55
C9 ²	119.8	153	141	189	172.5	217.5
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.

PGH Double Stage Dimensions-2



Specifications

Unit:mm

Dimensions	PGH142T	PGH180T	PGH220T
D1	165	215	250
D2	10.5	13	17
D3 _{h6}	40	55	75
D4 _{g6}	130	160	180
D5	50	70	114.4
D6	M16x2.0P	M20x2.5P	M20x1.5P
D7	186	239	292
L1	142	182	220
L2	91.5	100.5	138
L3	10	16	30
L4	2.5	2.5	3
L5	60	70	90
L6	5	6	7
L7	16	18	20
L8	127.5	166	202
L9	6	8	15
L10	38	48	42
L11	42	63	74
C1 ²	115	145	200
C2 ²	M8x1.25P	M8x1.25P	M12x1.75P
C3 ²	≤24/≤32/≤38	≤35/≤38	≤50
C4 ²	56	66.5	81
C5 ² _{F6}	95	110	114.3
C6 ²	10	6	6
C7 ²	115	140	180
C8 ²	63	80	93
C9 ²	282	346.5	433
B	12	16	20
H	43	59	79.5

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

★ Specification subject to change without notice.

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	1050	1700	
			5	22	60	160	330	600	1200	2000	
			6	20	55	150	310	560	1100	1900	
			7	19	50	140	300	530	1100	1800	
			8	17	45	120	260	480	1000	1600	
			9	14	40	100	230	450	900	1500	
			10	14	40	100	230	450	900	1500	
			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	1050	2000		
		25	22	60	160	330	600	1200	2000		
		30	22	60	160	330	600	1200	2000		
		35	22	60	160	330	600	1200	2000		
		40	22	60	160	330	600	1200	2000		
		45	22	60	160	330	600	1200	2000		
		50	22	60	160	330	600	1200	2000		
		60	20	55	150	310	560	1100	1900		
		70	19	50	140	300	530	1100	1800		
		80	17	45	120	260	480	1000	1600		
90	14	40	100	230	450	900	1500				
100	14	40	100	230	450	900	1500				
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	3	7	14	25	50	145	225	
Max. Radial Load F_{2rB}^1	N	1,2	3-100	760	1570	3250	6620	9400	14500	33000	
Max. Axial Load F_{2aB}^1	N	1,2	3-100	410	750	1870	3310	4670	6460	18530	
Operating Temp.	°C	-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 ²	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 ²	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		

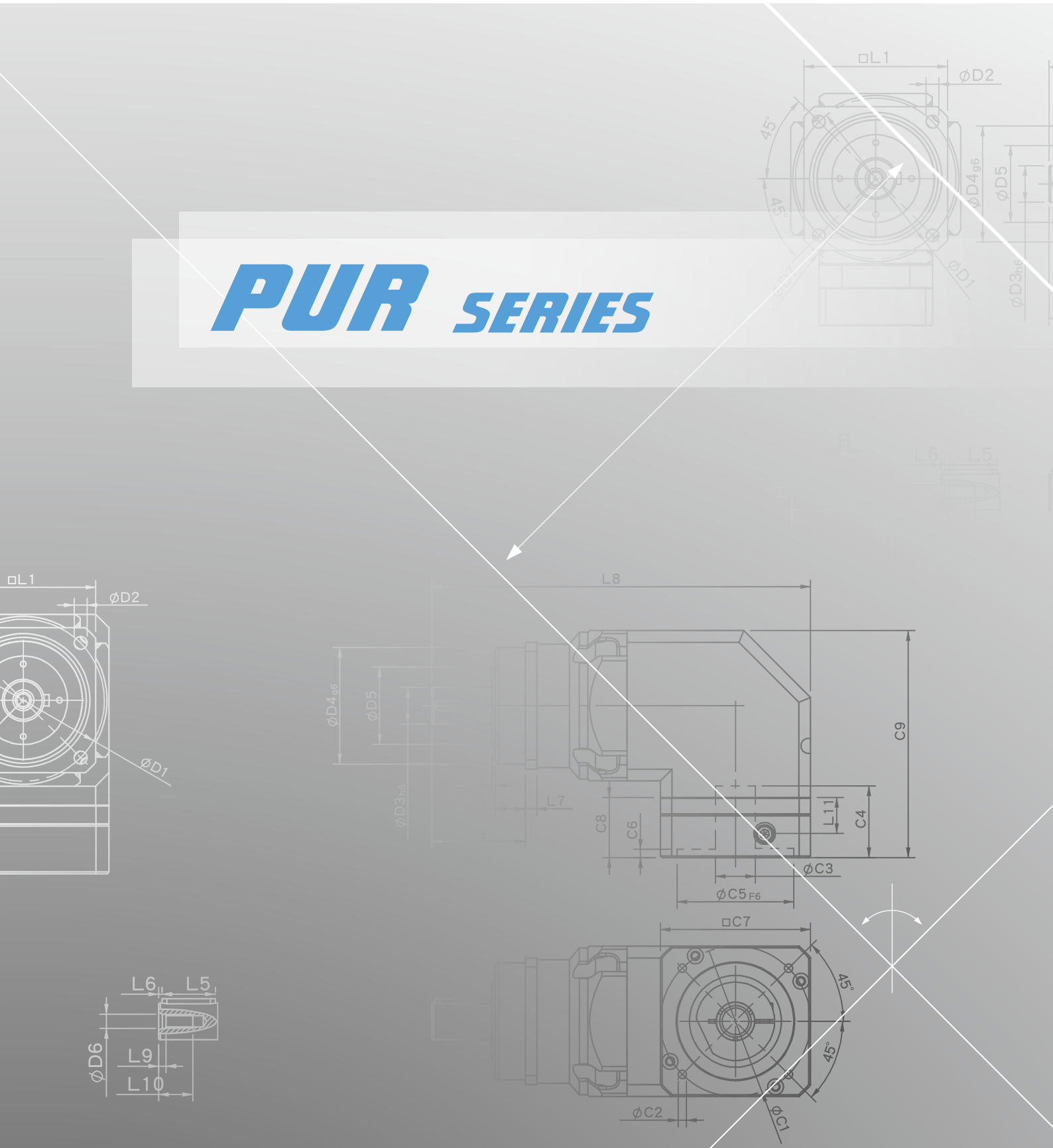
* 1. Applied to the output shaft center at 100 rpm.

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

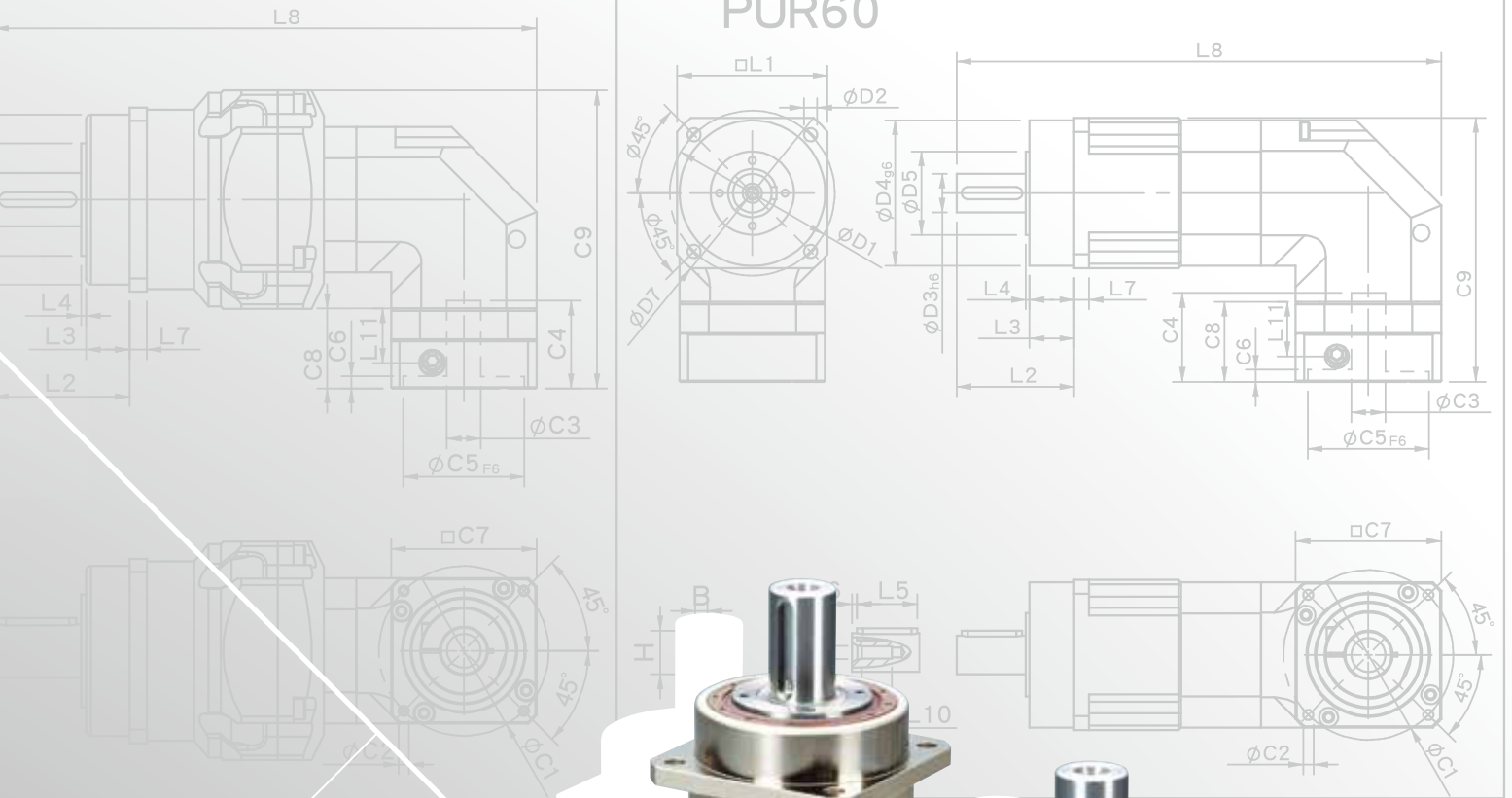
※ The above figures/specifications are subject to change without prior notice.

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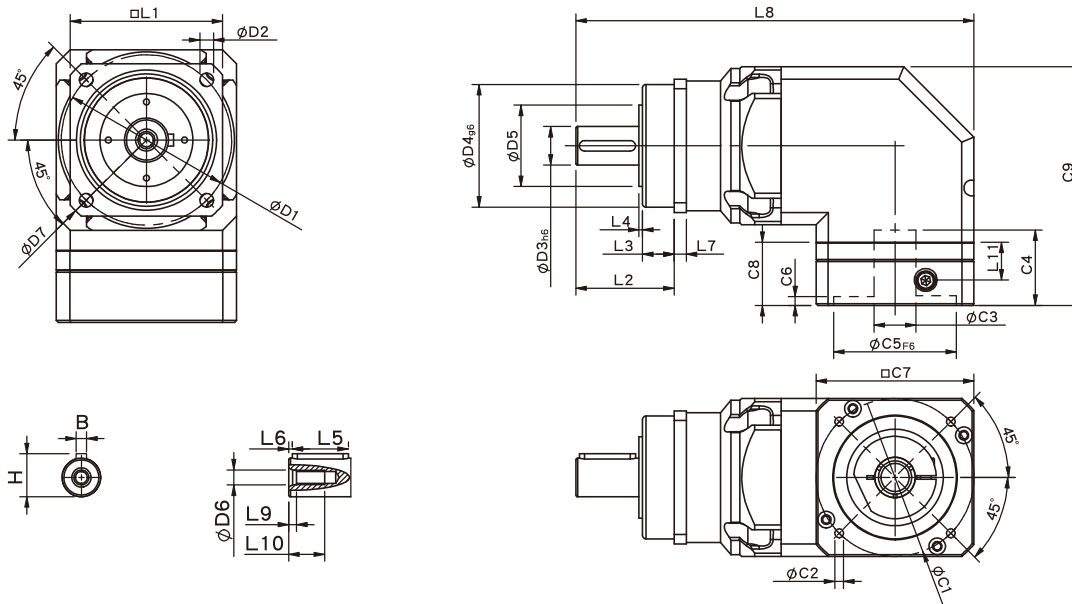
PUR SERIES



PUR60



PUR Single Stage Dimensions



Specifications

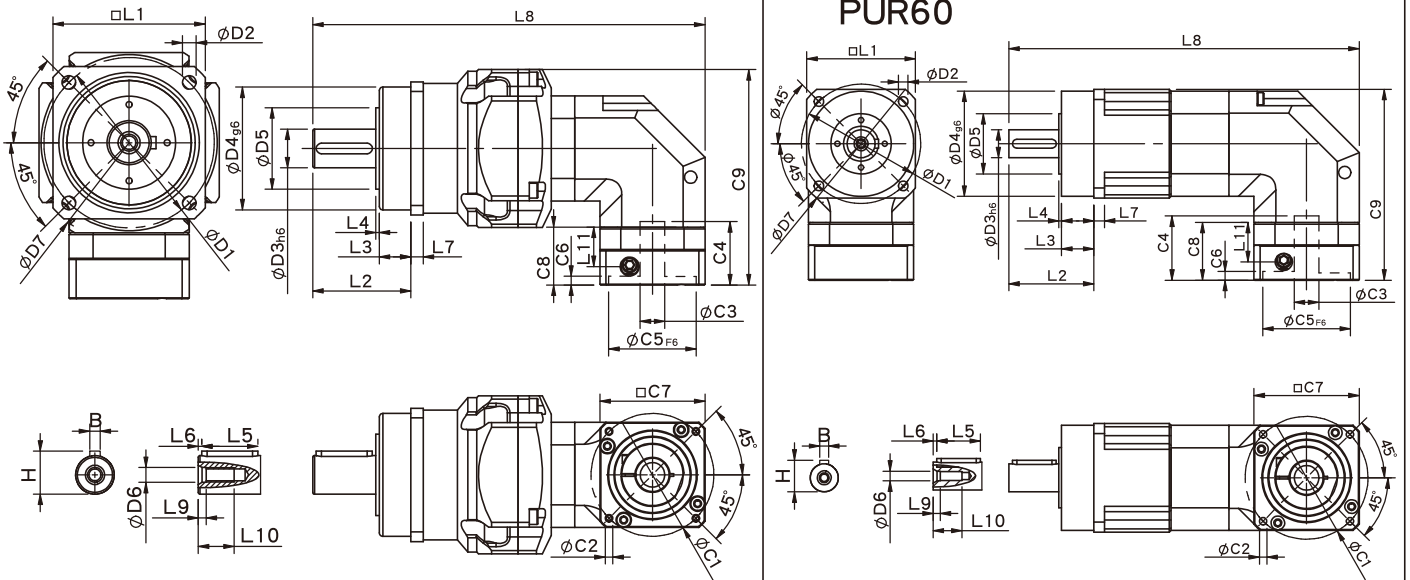
Unit:mm

Dimensions	PUR60	PUR75	PUR100	PUR140	PUR180	PUR220
D1 ^{H7}	68	85	120	165	215	250
D2	5.5	6.8	9	11	13	17
D3 _{h6}	16	22	32	40	55	75
D4 _{g6}	60	70	90	130	160	180
D5	34.4	46.4	59.6	79.2	94.5	114.4
D6	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	80	100	138	186	239	292
L1	62	76	105	142	180	220
L2	48.5	56	88	112	112	138
L3	18.5	18	28	27	27	30
L4	1.5	2	2	3	3	3
L5	25	32	40	60	70	90
L6	2	2	5	5	6	7
L7	6	7	10	12	15	20
L8	166.7	227	260.5	346.2	414.7	490.2
L9	4	4.5	6	6	8	15
L10	16.5	20.5	30	38	48	42
L11	22.5	21.5	31.8	44.7	44	60
C1*	70	90	115	145	200	215
C2*	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P	M12x1.75P
C3*	$\leq 14/\leq 19$	$\leq 19/\leq 24$	$\leq 24/\leq 32$	≤ 35	≤ 50	≤ 55
C4*	34	45	53.5	76.8	78.8	98.7
C5 ^{F6*}	50	70	95	110	114.3	180
C6*	4	4	6	5.5	6	6
C7*	60	90	115	140	180	220
C8*	33	36	48	65	65	85
C9*	108.8	136	174.5	207	247.5	287.5
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 motor flange.

* Specification subject to change without notice.

PUR Double Stage Dimensions



Specifications

Unit:mm

Dimensions	PUR60	PUR60T	PUR75T	PUR100T	PUR140T	PUR180T	PUR220T
D1	68	68	85	120	165	215	250
D2	5.5	5.5	6.8	9	11	13	17
D3 h6	16	16	22	32	40	55	75
D4 g6	60	60	70	90	130	160	180
D5	34.4	34.6	46.4	59.6	79.2	94.5	114.4
D6	M5x0.8P	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	80	80	100	138	186	239	292
L1	62	62	76	105	142	180	220
L2	48.5	48.5	56	88	112	112	138
L3	18.5	18.5	18	28	27	27	30
L4	1.5	1.5	2	2	3	3	3
L5	25	25	32	40	60	70	90
L6	2	2	2	5	5	6	7
L7	6	6	7	10	12	15	20
L8	199.7	170.3	223.7	286.5	358.5	445.4	537.2
L9	4	4	4.5	6	6	8	15
L10	16.5	16.5	20.5	30	38	48	42
L11	22.5	15.5	22.5	21.5	31.8	44.7	44
C1 ²	70	46	70	90	115	145	200
C2 ²	M5x0.8P	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 ²	≤14/≤19	≤8/≤11	≤14/≤19	≤19/≤24	≤24/≤32	≤35	≤50
C4 ²	34	29	34	45	53.5	76.8	78.8
C5 ² F6	50	30	50	70	95	110	114.3
C6 ²	4	4	4	6	6	5.5	6
C7 ²	60	42.6	60	90	115	140	180
C8 ²	33	25	33	36	48	65	65
C9 ²	108.8	80.5	122.8	148.5	188	223.5	267.5
B	6	5	6	10	12	16	20
H	18	18	24.5	35	43	59	79.5

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

* Specification subject to change without notice.

PUR Specifications Table

Specifications		Stage	Ratio	PUR-60	PUR-75	PUR-100	PUR-140	PUR-180	PUR-220
Nominal Output Torque T_{2N}	N • m	1	3	53	145	180	340	580	950
			4	55	150	240	500	1100	1500
			5	54	140	290	600	1200	1800
			6	46	135	280	500	1100	1620
			7	44	125	270	530	1100	1750
			8	41	110	240	470	1000	1550
			9	37	95	220	430	900	1500
			10	50	130	260	540	900	1500
		14	44	125	270	530	1100	1750	
		20	37	95	220	430	900	1450	
		Stage	Ratio	PUR-60 (T)	PUR-75T	PUR-100T	PUR-140T	PUR-180T	PUR-220T
		2	15	53	145	180	600	1200	2000
			20	55	150	240	600	1200	2000
			25	54	140	290	600	1200	2000
			30	53	145	180	600	1200	2000
			35	54	140	290	600	1200	2000
			40	55	150	240	600	1200	2000
			45	54	140	290	600	1200	2000
			50	54	140	290	600	1200	2000
			60	46	135	280	560	1100	1850
70	44		125	270	530	1100	1750		
80	41		110	240	480	1000	1550		
90	37		95	220	430	900	1500		
100	37	95	220	430	900	1450			
120	46	135	280	560	1100	1850			
140	44	125	270	530	1100	1750			
160	41	110	240	480	1000	1550			
180	37	95	220	430	900	1500			
200	37	95	220	430	900	1450			
Emergency Stop Torque T_{2NOT}	N • m		(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	3-200	5000	4000	4000	3000	3000	2000
Max. Input Speed n_{1max}	rpm	1,2	3-200	10000	8000	8000	6000	6000	4000
Micro Backlash P0	arcmin	1	3-20	-	≤ 3	≤ 2	≤ 2	≤ 2	≤ 2
		2	15-200	-	≤ 5	≤ 4	≤ 4	≤ 4	≤ 4
Precision Backlash P1	arcmin	1	3-20	≤ 5	≤ 5	≤ 4	≤ 4	≤ 4	≤ 4
		2	15-200	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
Standard Backlash P2	arcmin	1	3-20	≤ 7	≤ 7	≤ 6	≤ 6	≤ 6	≤ 6
		2	15-200	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
Torsional Rigidity	N • m /arcmin	1,2	3-200	7	14	25	50	150	220
Max. Radial Load F_{2rB}^1	N	1,2	3-200	4130	5220	10650	17600	22000	27800
Max. Axial Load F_{2aB}^1	N	1,2	3-200	2500	3300	5700	11300	14000	16200
Operating Temp.	°C		3-200	-10 °C ~ +90 °C					
Service Life	hr		3-200	30,000 (15,000 Continuous operation)					
Efficiency	%	1	3-20	≥ 95%					
		2	15-200	≥ 92%					
Weight	kg	1	3-20	3.1	5.5	12.5	25.5	46	75
		2	15-200	3.7(3.3)	4.9	13.6	27	50	88
Mounting Position	-	1,2	3-200	Any direction					
Noise Level ²	dBA/1m	1,2	3-200	64	66	68	70	72	74
Protection Class	-	1,2	3-200	IP65					
Lubrication	-	1,2	3-200	Synthetic Lubricant					
Inertia (J1)									
Stage	Ratio	unit		PUR-60	PUR-75	PUR-100	PUR-140	PUR-180	PUR-220
1	3/4/5/7/9	Kg • cm ²		0.40	2.28	6.87	24.2	69.8	138.2
	6/8/10/14/20			0.30	1.45	4.76	14.5	50.3	103.6
Stage	Ratio			PUR-60(T)	PUR-75T	PUR-100T	PUR-140T	PUR-180T	PUR-220T
2	15/20/25/35/45			0.40(0.08)	0.72	3.02	7.83	27.7	80.3
	others			0.30(0.06)	0.38	1.64	5.00	15.9	55.3

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

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

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

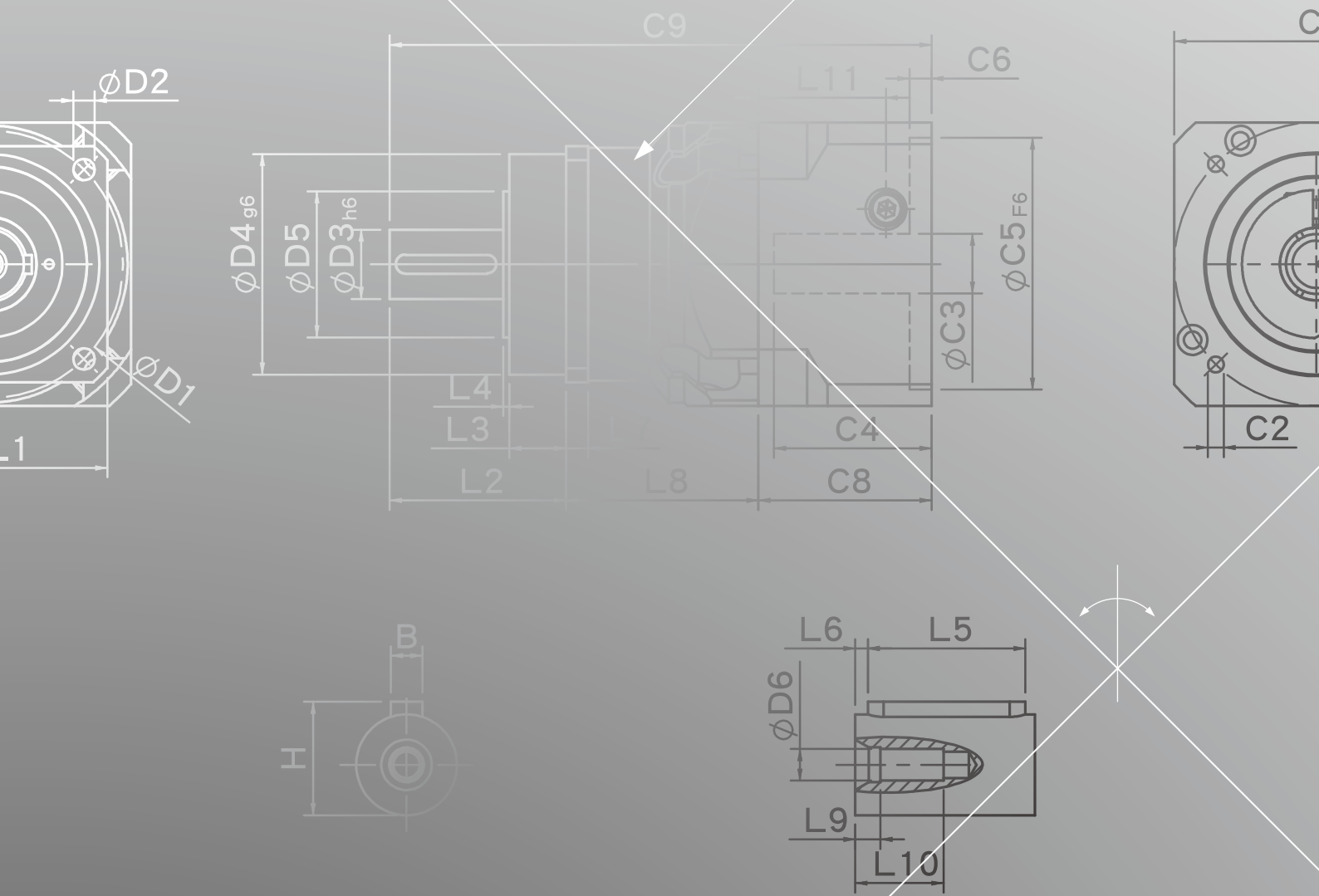
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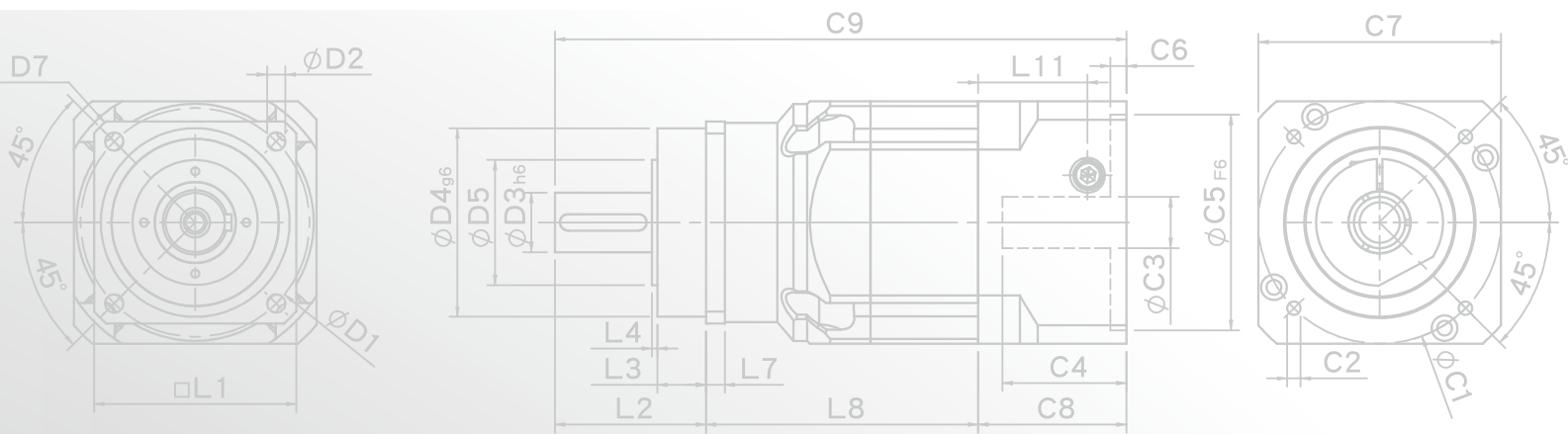
PLANETARY GEARHEADS



- PHL
- PHFR
- PHF
- PGH
- PUR**
- PUL
- PUA
- PGLH
- PGCH
- PGEH
- PGSH
- PGL
- PGC
- PGE
- SGC
- SGE
- SGE
- PGRH
- PGR
- PGFR
- PGF
- PBC
- PBE
- PAE
- PAC
- PAN
- PGS
- PNS
- PGW

PUL SERIES

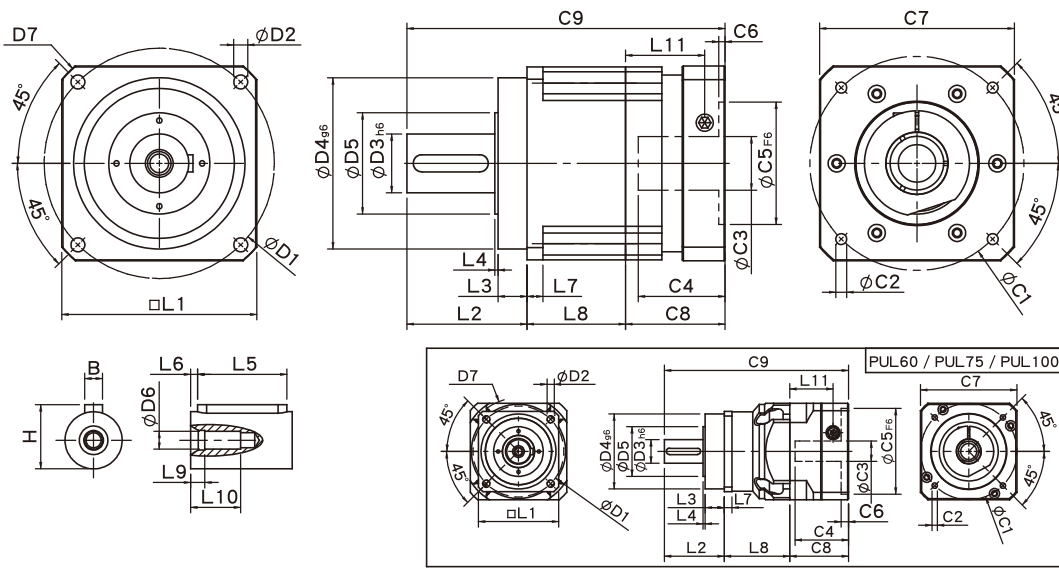




PUL60T/PUL75T/PUL100T



PUL Single Stage Dimensions



Specifications

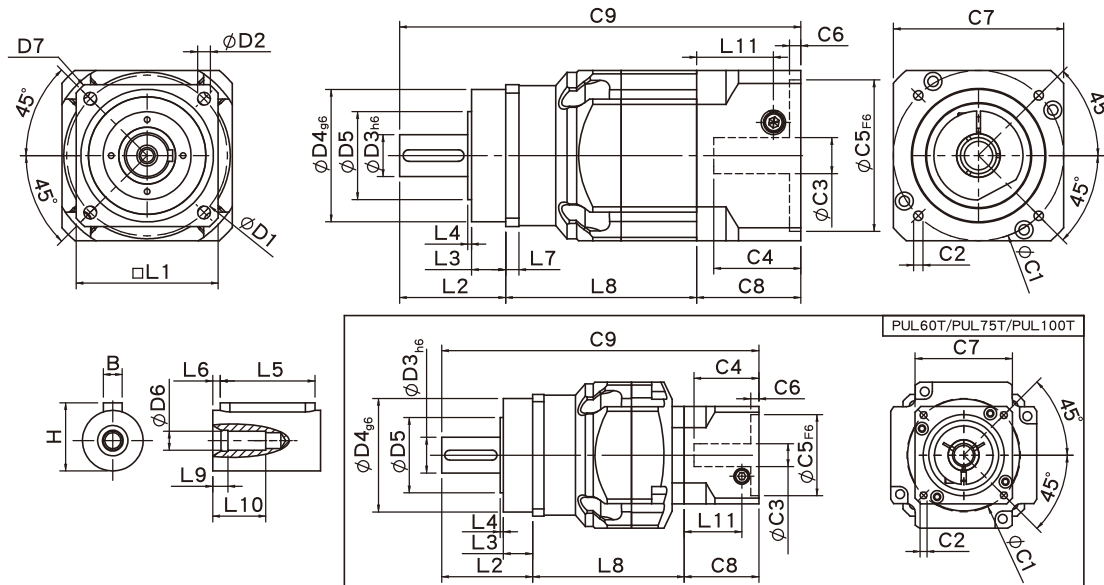
Unit:mm

Dimensions	PUL60	PUL75	PUL100	PUL140	PUL180	PUL220
D1	68	85	120	165	215	250
D2	5.5	6.8	9	11	13	17
D3 _{h6}	16	22	32	40	55	75
D4 _{g6}	60	70	90	130	160	180
D5	34.6	46.4	59.6	79.2	94.5	114.4
D6	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	80	100	138	186	239	292
L1	62	76	105	142	180	220
L2	48.5	56	88	112	112	138
L3	18.5	18	28	27	27	30
L4	1.5	2	2	3	3	3
L5	25	32	40	60	70	90
L6	2	2	5	5	6	7
L7	6	7	10	12	15	20
L8	44	61	46	64.5	92	111
L9	4	4.5	6	6	8	15
L10	16.5	20.5	30	38	48	42
L11	35.5	40.5	41.8	70	74	96
C1 ²	70	90	115	165	200	235
C2 ²	M5x0.8P	M6x1P	M8x1.25P	M10x1.5P	M12x1.75P	M12x1.75P
C3 ²	≤14/≤19	≤19/≤24	≤24/≤32/≤38	≤35/≤38	≤50	≤55
C4 ²	37	47	51	66.7	81	112
C5 ² _{F6}	50	70	95	130	114.3	200
C6 ²	4	6	6	5.5	6	6
C7 ²	60	90	115	140	182	220
C8 ²	46	55	58	87.2	93	120
C9 ²	138.5	172	192	263.7	297	369
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 motor flange.

★ Specification subject to change without notice.

PUL Double Stage Dimensions-1



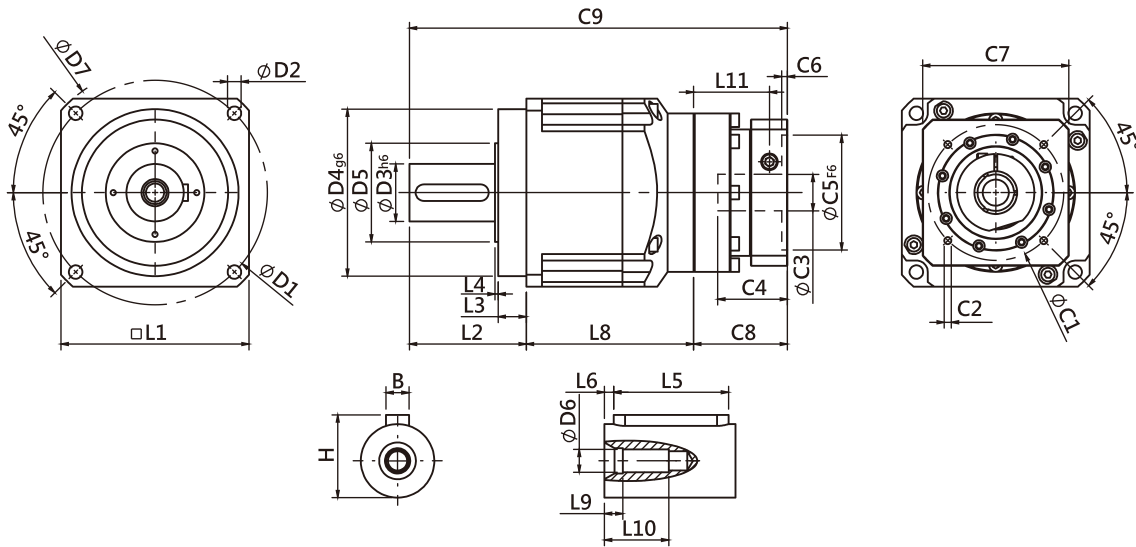
Specifications Unit:mm

Dimensions	PUL60/PUL60T		PUL75/PUL75T		PUL100T
D1	68		85		120
D2	5.5		6.8		9
D3 _{h6}	16		22		32
D4 _{g6}	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 ²	70	46	90	70	90
C2 ²	M5x0.8P	M4x0.7P	M6x1P	M5x0.8P	M6x1P
C3 ²	≤14/≤19	≤8/≤11	≤19/≤24	≤14/≤19	≤19/≤24
C4 ²	37	27	47	37	47
C5 ² _{F6}	50	30	70	50	70
C6 ²	4	4	6	4	6
C7 ²	60	42.6	90	60	90
C8 ²	46	38.5	55	46	55
C9 ²	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 motor flange.

★ 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 _{h6}	40	55	75
D4 _{g6}	130	160	180
D5	79.2	94.5	114.4
D6	M16x2.0P	M20x2.5P	M20x2.5P
D7	186	239	292
L1	142	180	220
L2	112	112	138
L3	27	27	30
L4	3	3	3
L5	60	70	90
L6	5	6	7
L7	12	15	20
L8	120	160.2	202
L9	6	8	15
L10	38	48	42
L11	41.8	72.6	74
C1 ²	130	130	200
C2 ²	M8x1.25P	M8x1.25P	M12x1.75P
C3 ²	≤24/≤32/≤38	≤35/≤38	≤50
C4 ²	51	66.7	81
C5 ² _{F6}	110	110	114.3
C6 ²	6	5.5	6
C7 ²	115	140	180
C8 ²	58	89.8	93
C9 ²	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 motor flange.

★ 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	340	580	1100	
			4	55	150	240	500	1100	1700	
			5	54	140	290	600	1200	2000	
			6	46	135	280	560	1100	1850	
			7	44	125	270	530	1100	1750	
			8	41	110	240	480	1000	1550	
			9	37	95	220	430	900	1500	
			10	37	95	220	430	900	1450	
			Stage	Ratio	PUL-60 (T)	PUL-75(T)	PUL-100T	PUL-140T	PUL-180T	PUL-220T
			2	15	53	145	180	520	1200	2000
	20	55		150	240	600	1200	2000		
	25	54		140	290	600	1200	2000		
	30	54		140	290	600	1200	2000		
	35	54		140	290	600	1200	2000		
	40	54		140	290	600	1200	2000		
	45	54		140	290	600	1200	2000		
	50	54		140	290	600	1200	2000		
	60	46		135	280	560	1200	1850		
	70	44		125	270	530	1100	1750		
	80	41	110	240	480	1000	1550			
90	37	95	220	430	900	1500				
100	37	95	220	430	900	1450				
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	37.0	68.5	
Mounting Position	-	1,2	3-100	Any direction						
Noise Level ²	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 ²		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		0.17(0.02)	0.65(0.17)	0.65	1.50	6.52	30.50		
	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 at 100 rpm.

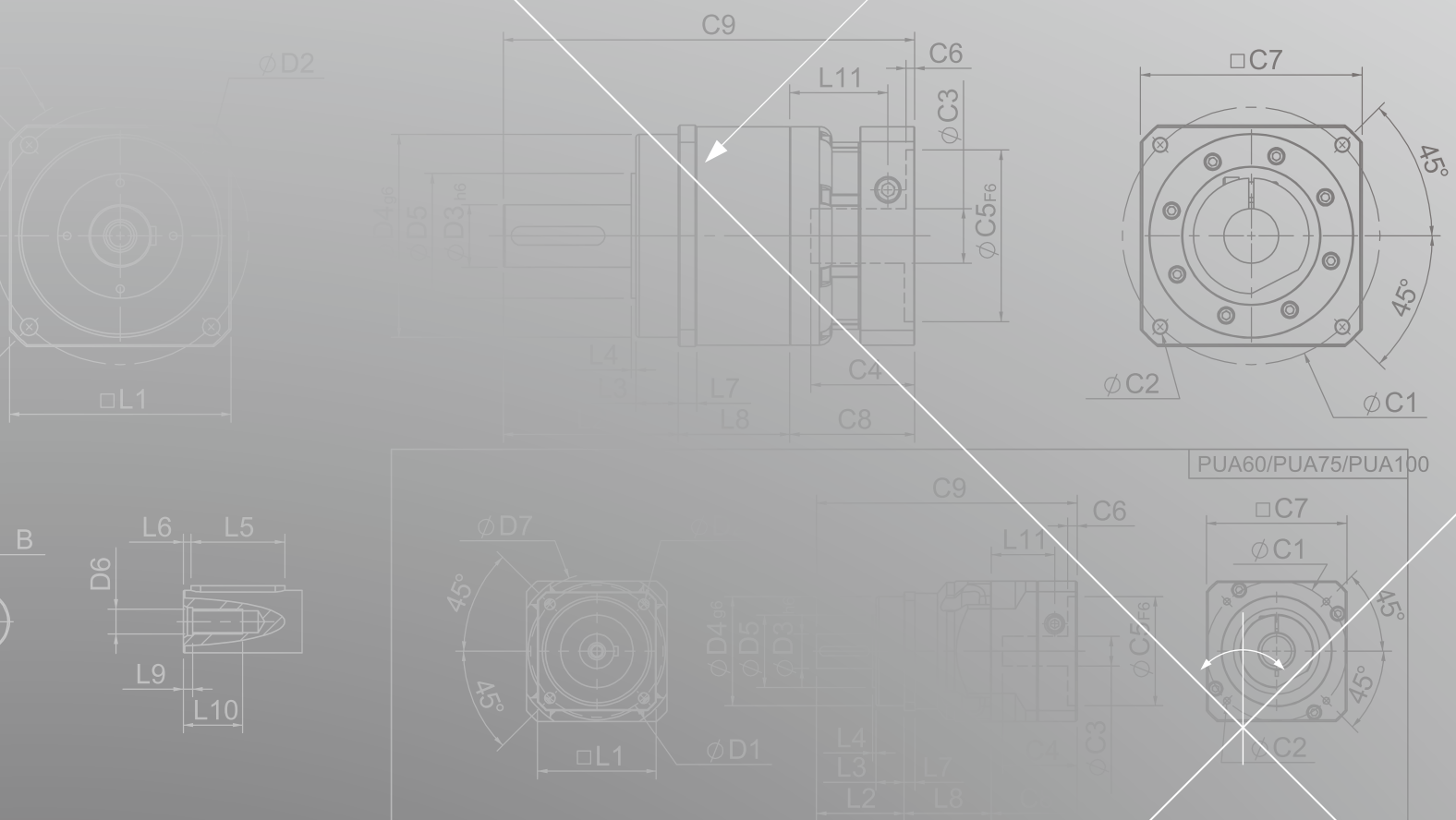
* 2. Measured at 3000 rpm with no load. These values are measured by gearbox with ratio = 10 (1-stage) or ratio = 100 (2-stage) at nominal input speed or 3000 rpm (if nominal input speed is higher than 3000 rpm) with no load.

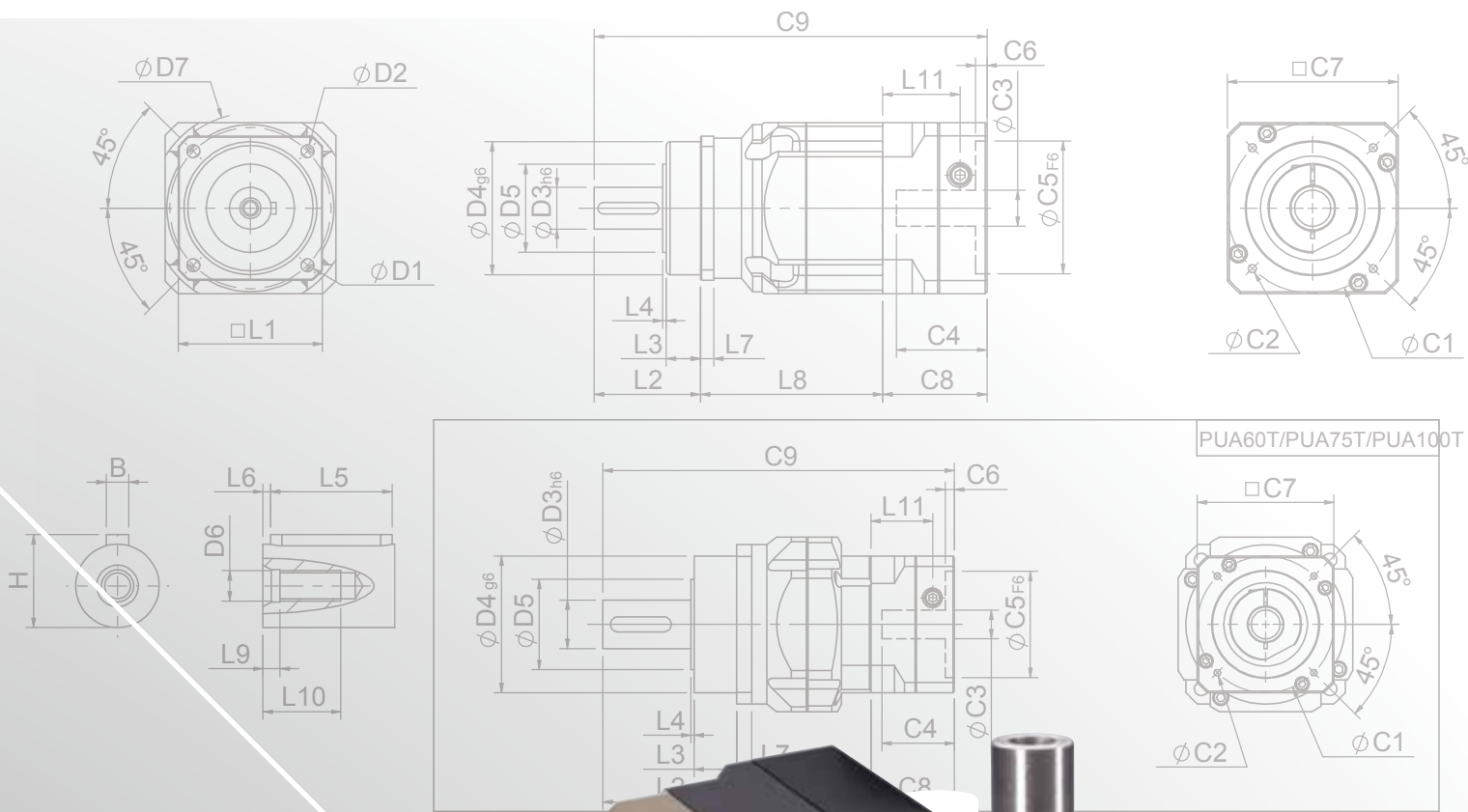
※ The above figures/specifications are subject to change without prior notice.

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

PUL PHFR PHF PGH PUK PUA PGLH PGCH PGEH PGSH PGL PGC PGE SGC SGE PGRH PGR PGFR PGF PBC PBE PAE PAC PAN PGS PNS PGW

PUA SERIES

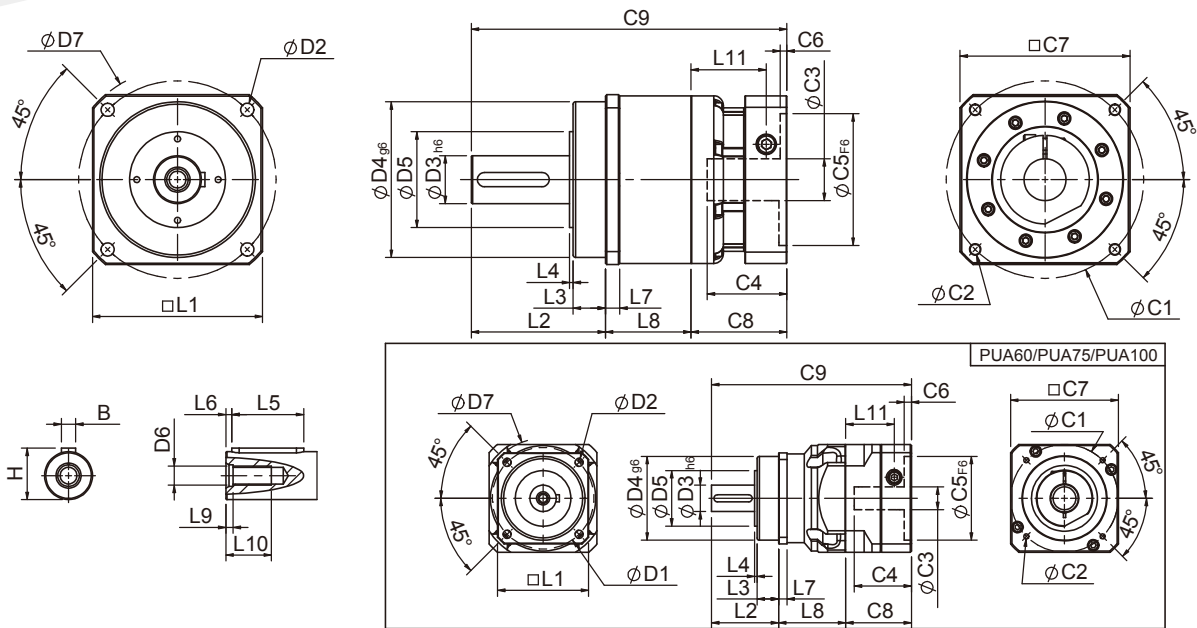




PUA60T/PUA75T/PUA100T



PUA Single Stage Dimensions



Specifications

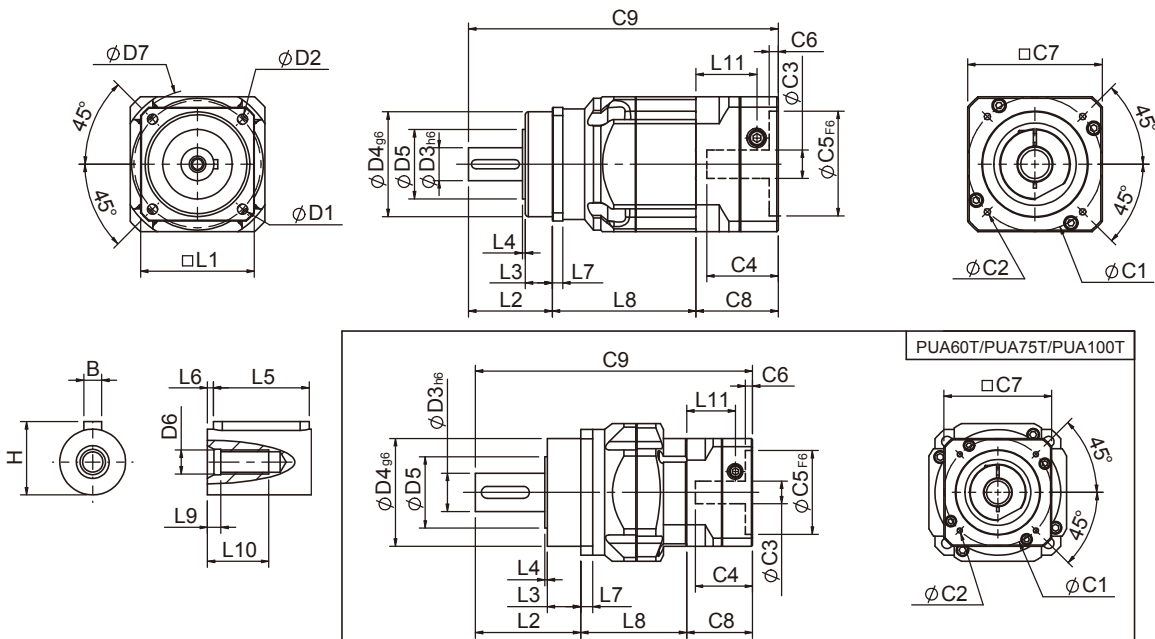
Unit:mm

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

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

* Specification subject to change without notice.

PUA Double Stage Dimensions-1



Specifications

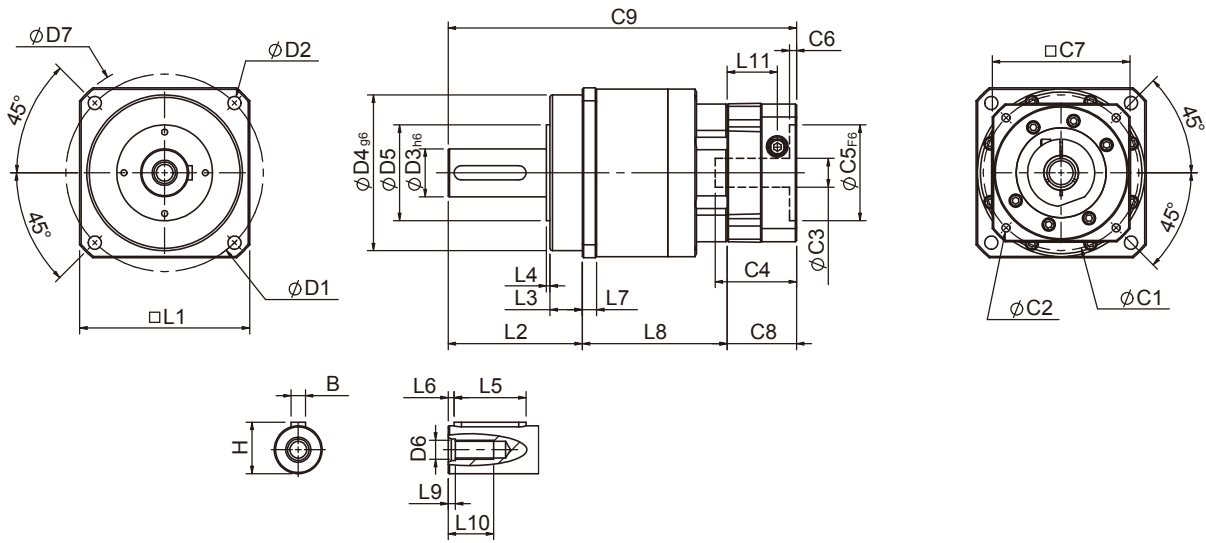
Unit:mm

Dimensions	PUA60	PUA60T	PUA75	PUA75T	PUA100T
D1		68		85	120
D2		5.5		6.8	9
D3 _{h6}		16		22	32
D4 _{g6}		60		70	90
D5		34.4		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	65.5	61	96	88.5	88.5
L9		4		4.5	6
L10		16.5		20.5	30
L11	35.5	29	40.5	35.5	40.5
C1 ²	70	46	90	70	90
C2 ²	M5x0.8P	M4x0.7P	M6x1P	M5x0.8P	M6x1P
C3 ²	≤14/≤19	≤8/≤14	≤19/≤24	≤14/≤19	≤19/≤24
C4 ²	37	27	47.8	37	47.8
C5 ² _{F6}	50	30	70	50	70
C6 ²	4	4	6	4	6
C7 ²	60	42.6	90	60	90
C8 ²	46	38.5	55	46	55
C9 ²	160	148	207	190.5	231.5
B		5		6	10
H		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.

PUA Double Stage Dimensions-2



Specifications

Unit:mm

Dimensions	PUA140T	-	-
D1	165	-	-
D2	11	-	-
D3 _{h6}	40	-	-
D4 _{g6}	130	-	-
D5	79.2	-	-
D6	M16x2.0P	-	-
D7	186	-	-
L1	142	-	-
L2	112	-	-
L3	27	-	-
L4	3	-	-
L5	60	-	-
L6	5	-	-
L7	12	-	-
L8	121	-	-
L9	6	-	-
L10	38	-	-
L11	41.8	-	-
C1 ²	130	-	-
C2 ²	M8x1.25P	-	-
C3 ²	≤24/≤32/≤38	-	-
C4 ²	51	-	-
C5 ² _{F6}	110	-	-
C6 ²	6	-	-
C7 ²	115	-	-
C8 ²	58	-	-
C9 ²	291	-	-
B	12	-	-
H	43	-	-

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

★ Specification subject to change without notice.

PUA Specifications Table

Specifications		Stage	Ratio	PUA60	PUA-75	PUA-100	PUA-140
Nominal Output Torque T_{2N}	N · m	1	3	53	145	180	340
			4	55	150	240	500
			5	54	140	290	600
			6	46	135	280	560
			7	44	125	270	530
			8	41	110	240	480
			9	37	95	220	430
			10	37	95	220	430
		Stage	Ratio	PUA-60 / PUA-60T	PUA-75 / PUA-75T	PUA-100T	PUA-140T
		2	15	53	145	180	520
			20	55	150	240	600
			25	54	140	290	600
			30	54	140	290	600
			35	54	140	290	600
			40	54	140	290	600
			45	54	140	290	600
			50	54	140	290	600
			60	46	135	280	560
			70	44	125	270	530
80	41		110	240	480		
90	37	95	220	430			
100	37	95	220	430			
Emergency Stop Torque T_{2NOT}	N · m	(3.0 times of Nominal Output Torque) (* Max. Output Torque T_{2B} = 60% of Emergency Stop Torque)					
Nominal Input Speed n_{1N}	rpm	1,2	3-100	4000	3500	3000	2500
Max. Input Speed n_{1max}	rpm	1,2	3-100	6000	6000	5000	4500
Micro Backlash P_0	arcmin	1	3-10	≤ 2	≤ 2	≤ 1	≤ 1
		2	12-100	≤ 4	≤ 4	≤ 3	≤ 3
Precision Backlash P_1	arcmin	1	3-10	≤ 4	≤ 4	≤ 3	≤ 3
		2	12-100	≤ 6	≤ 6	≤ 5	≤ 5
Standard Backlash P_2	arcmin	1	3-10	≤ 6	≤ 6	≤ 5	≤ 5
		2	12-100	≤ 8	≤ 8	≤ 7	≤ 7
Torsional Rigidity	N · m / arcmin	1,2	3-100	7	14	25	50
Max. Radial Load F_{2rB}^1	N	1,2	3-100	1900	5000	7410	11380
Max. Axial Load F_{2aB}^1	N	1,2	3-100	1500	3080	4500	8830
Operating Temp.	°C	-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	1.5	3.5	6.6	14.5
		2	12-100	2.0/1.7	5.2/4.0	8.1	17.5
Mounting Position	-	1,2	3-100	Any Direction			
Noise Level ²	dBA/1m	1,2	3-100	58	60	63	65
Protection Class	-	1,2	3-100	IP65			
Lubrication	-	1,2	3-100	Synthetic Lubricant			
Inertia (J1)							
Stage	Ratio	unit		PUA60	PUA-75	PUA-100	PUA-140
1	3	Kg · cm ²		0.23	0.97	2.35	10.00
	4			0.18	0.67	1.66	7.17
	5			0.17	0.65	1.50	6.52
	6/7/8			0.14	0.60	1.45	6.17
	9/10			0.14	0.58	1.41	6.10
Stage	Ratio			PUA-60(T)	PUA-75(T)	PUA-100T	PUA-140T
2	15/20			0.17(0.02)	0.65(0.17)	0.65	2.35
	25/30/35/40			0.14(0.02)	0.60(0.14)	0.60	1.45
	45/50/60/70/80/90/100			0.14(0.02)	0.58(0.14)	0.58	1.41

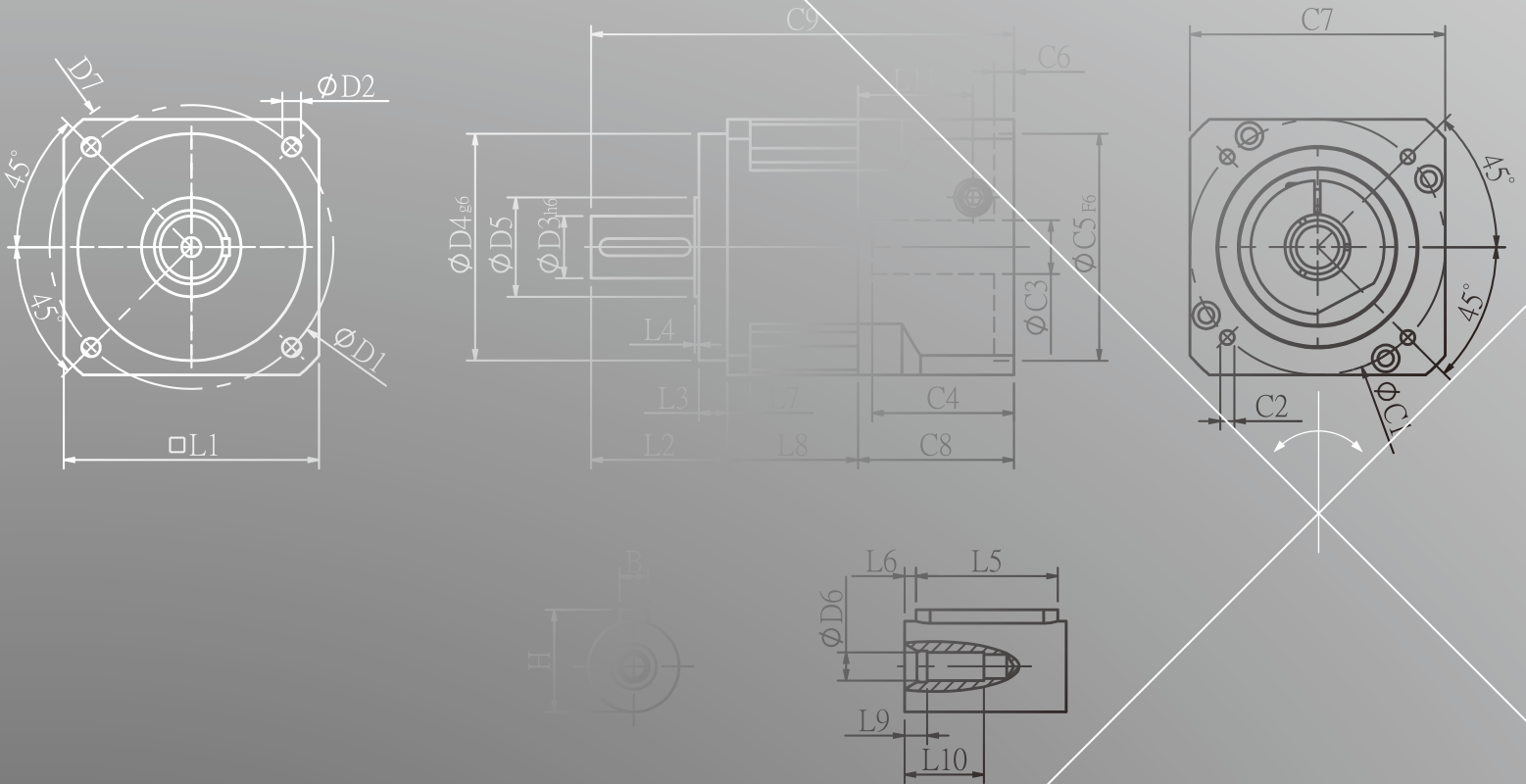
* 1. Applied to the output shaft center at 100 rpm.

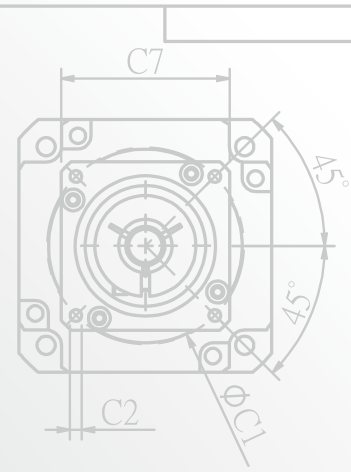
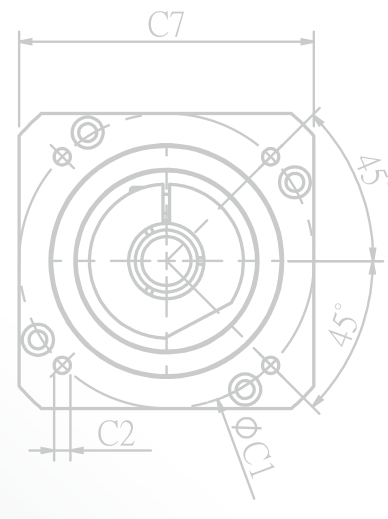
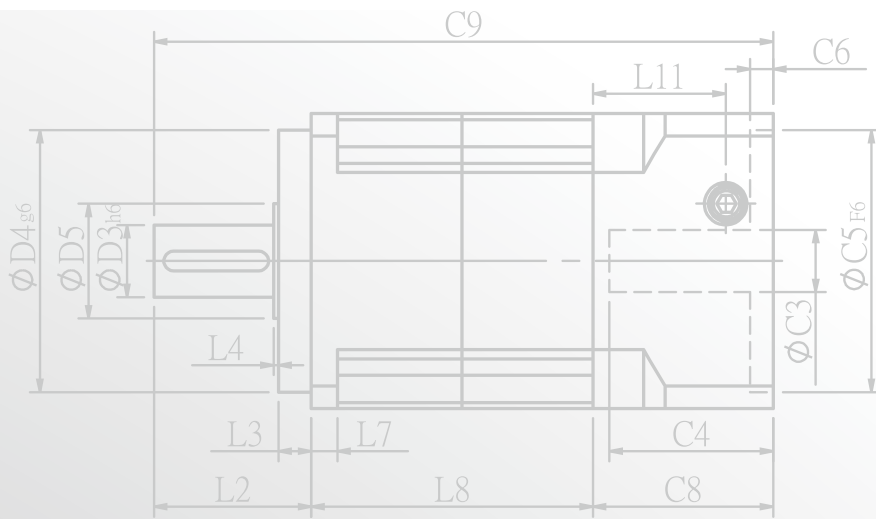
* 2. Measured at 3000 rpm with no load. These values are measured by gearbox with ratio = 10 (1-stage) or ratio = 100 (2-stage) at nominal input speed or 3000 rpm (if nominal input speed is higher than 3000 rpm) with no load.

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

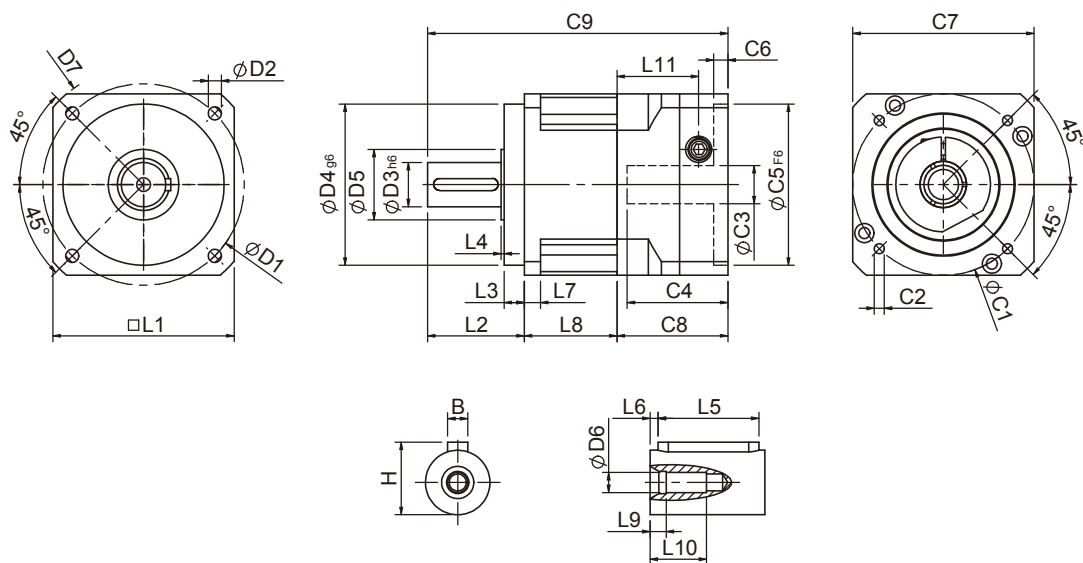
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PGLH SERIES





PGLH Single Stage Dimensions



Specifications

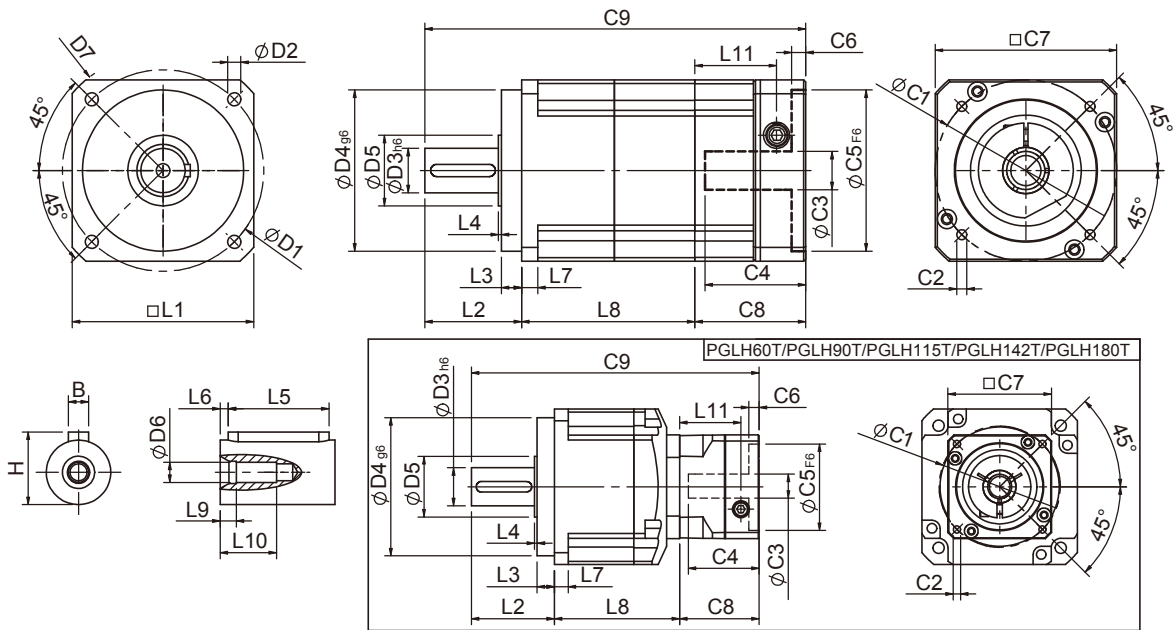
Unit:mm

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 _{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	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 ²	46	70	90	115	145	200
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 ²	≤8/≤14	≤14/≤19	≤19/≤24	≤24/≤32/≤38	≤35/≤38	≤50
C4 ²	27	37	41	56.3	66.5	82
C5 ² _{F6}	30	50	70	95	110	114.3
C6 ²	4	4	6	10	5.5	13
C7 ²	42.6	60	90	115	140	182
C8 ²	38.5	46	55	75	80	95
C9 ²	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	40.5	41.8	62.8
C1 ²	46	70	46	90	70	90	115	145
C2 ²	M4x0.7P	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P
C3 ²	≤8/≤14	≤14/≤19	≤8/≤14	≤19/≤24	≤14/≤19	≤19/≤24	≤24/≤32/≤38	≤35/≤38
C4 ²	27	37	27	41	37	41	56	66.5
C5 ² _{F6}	30	50	30	70	50	70	95	110
C6 ²	4	4	4	6	4	6	10	5.5
C7 ²	42.6	60	42.6	90	60	90	115	140
C8 ²	38.5	46	38.5	55	46	55	63	80
C9 ²	119.8	153	141	193	172.5	217.5	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	PGLH-220
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	600	1050	-
			6	15	46	135	280	560	1000	-
			7	14	44	125	270	530	960	-
			8	12	41	110	240	480	900	-
			9	11	37	95	220	430	800	-
		10	11	37	95	220	430	800	-	
		Stage	Ratio	PGLH-42	PGLH-60 / PGLH-60T	PGLH-90 / PGLH-90T	PGLH-115T	PGLH-142T	PGLH-180T	PGLH-220T
		2	15	19	53	145	290	520	950	-
			20	20	55	150	300	550	1000	-
			25	17	54	140	290	600	1050	-
			30	17	54	140	290	600	1050	-
			35	17	54	140	290	600	1050	-
			40	17	54	140	290	600	1050	-
			45	17	54	140	290	600	1050	-
			50	17	54	140	290	600	1050	-
			60	15	46	135	280	560	1000	-
			70	14	44	125	270	530	960	-
80	12		41	110	240	480	900	-		
90	11		37	95	220	430	800	-		
100	11	37	95	220	430	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	2000
Max. Input Speed n_{1max}	rpm	1,2	3-100	8000	8000	6000	6000	5000	4000	4000
Micro Backlash P_0	arcmin	1	3-10	≤4	≤4	≤4	≤3	≤3	≤3	≤3
		2	12-100	≤6	≤6	≤6	≤5	≤5	≤5	≤5
Precision Backlash P_1	arcmin	1	3-10	≤6	≤6	≤6	≤5	≤5	≤5	≤5
		2	12-100	≤8	≤8	≤8	≤7	≤7	≤7	≤7
Standard Backlash P_2	arcmin	1	3-10	≤8	≤8	≤8	≤7	≤7	≤7	≤7
		2	12-100	≤10	≤10	≤10	≤9	≤9	≤9	≤9
Torsional Rigidity	N · m /arcmin	1,2	3-100	2.5	6	12	23	50	145	-
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 ²	dBA/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	PGLH-220	
1	3	Kg · cm ²	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	PGLH-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 at 100 rpm.

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

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

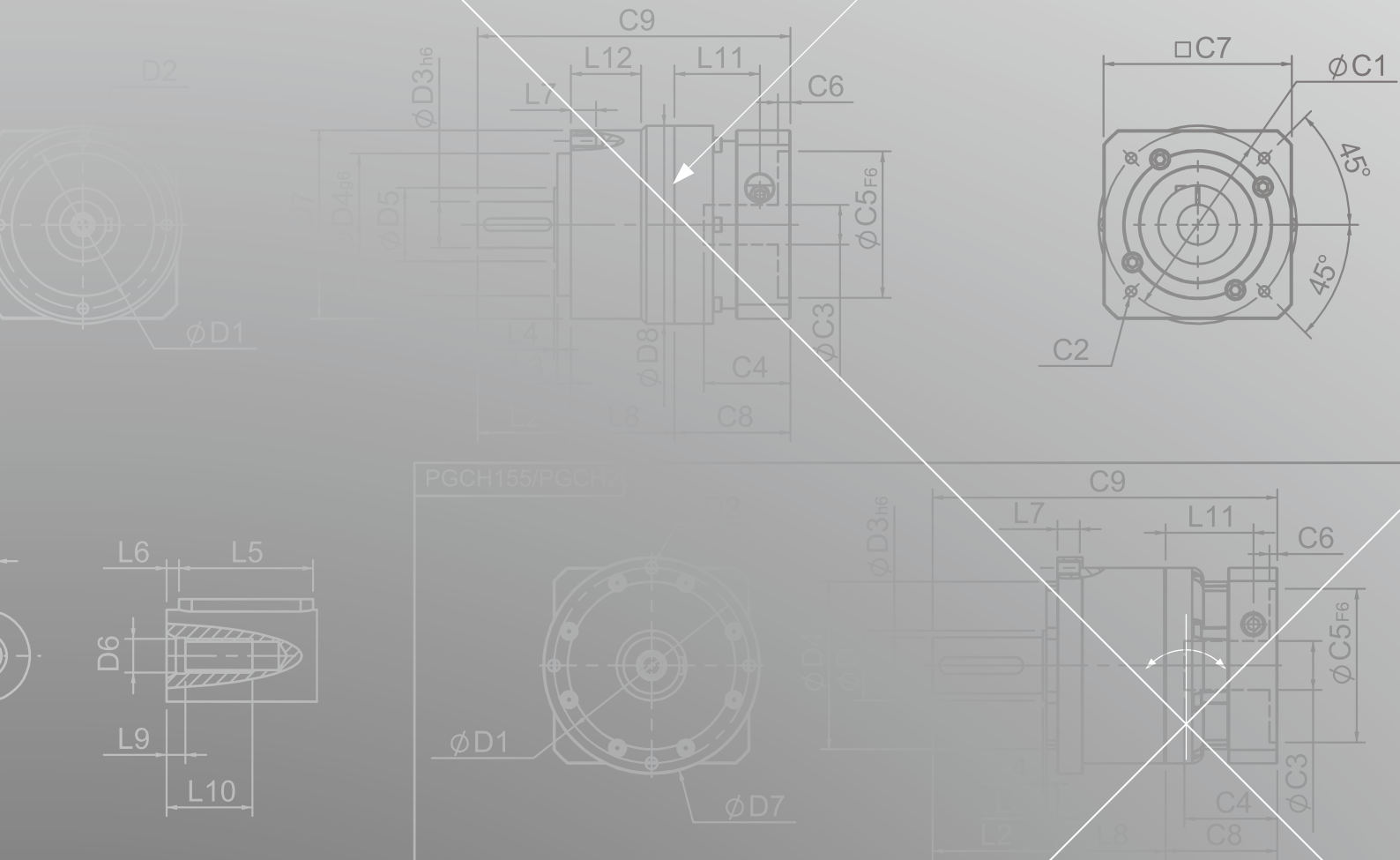
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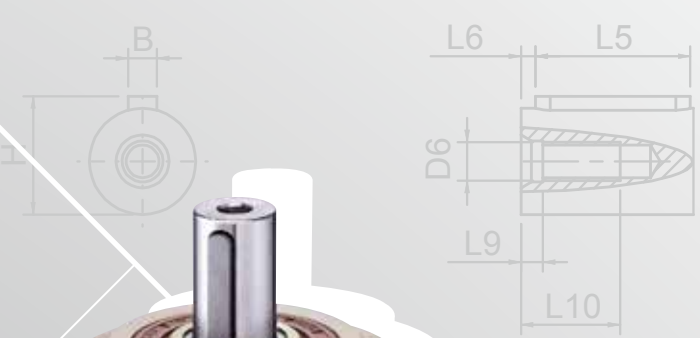
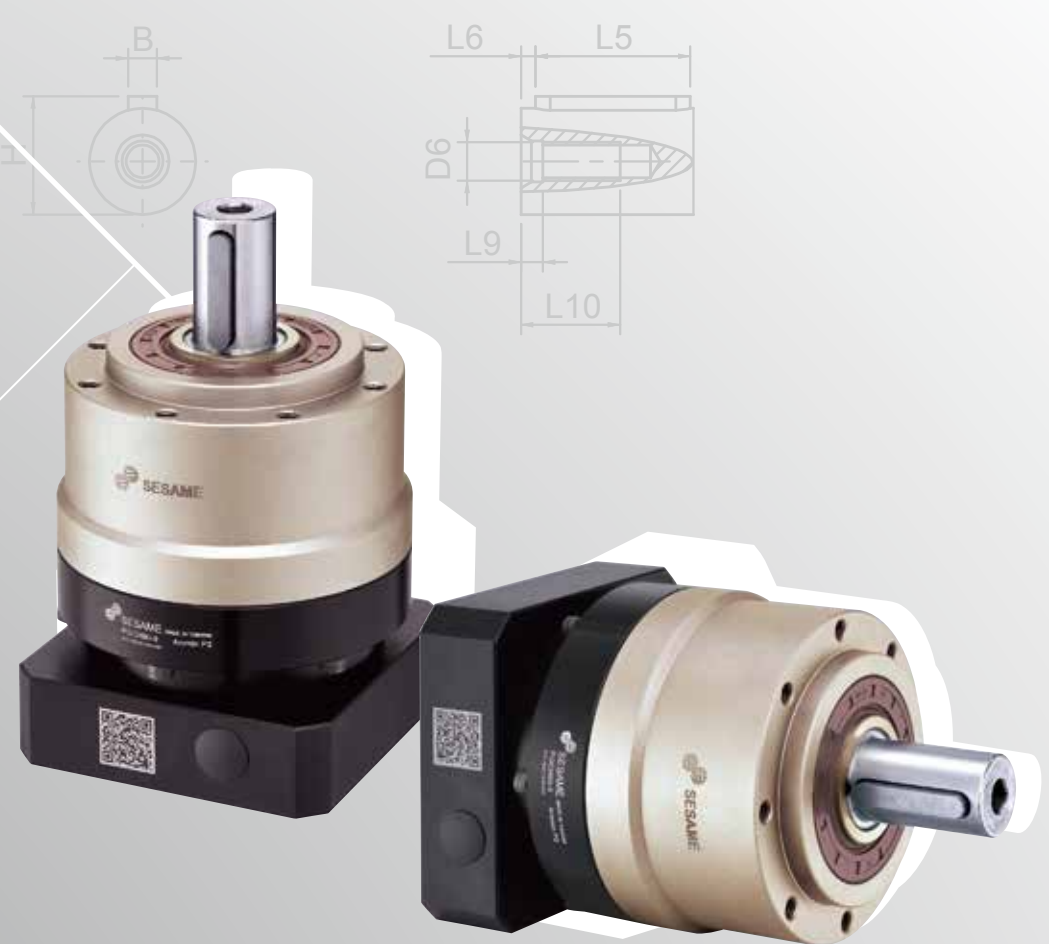
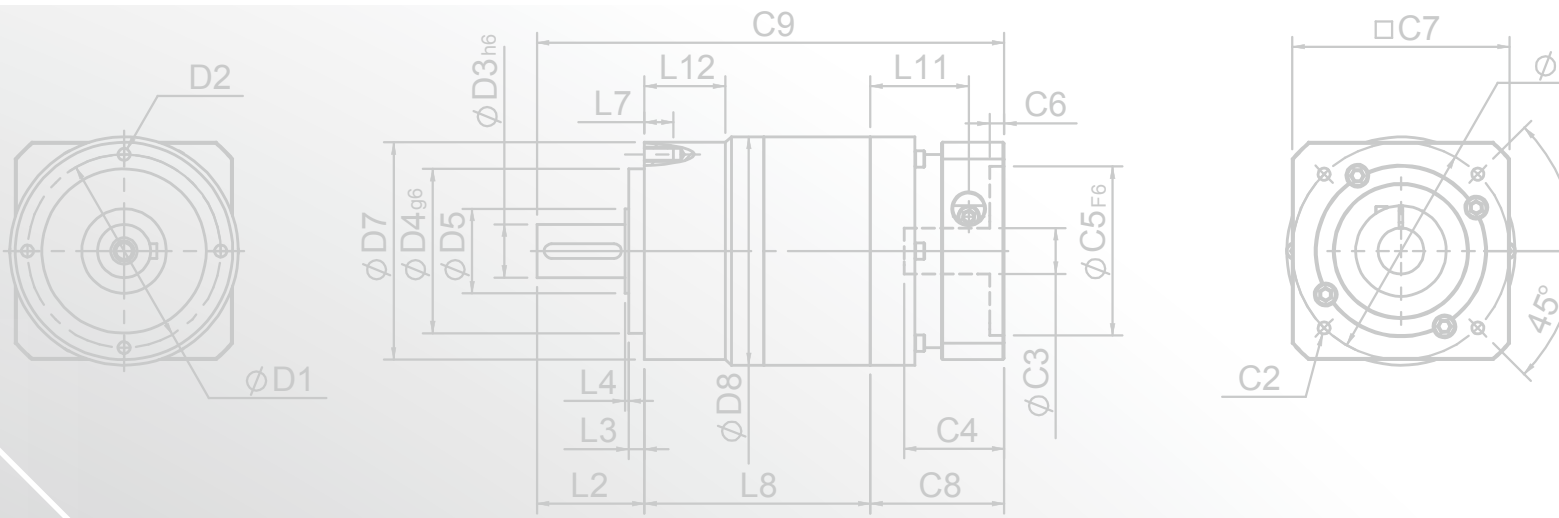
PLANETARY GEARHEADS



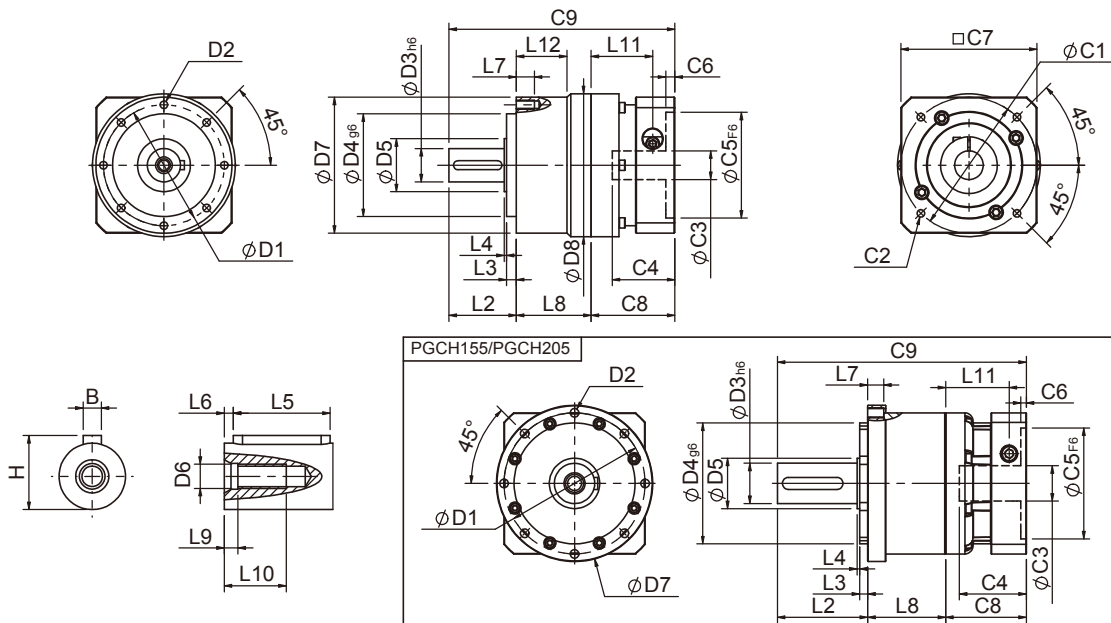
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- PHFR
- PHF
- PGH
- PUR
- PUL
- PUA
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- SGC
- SGE
- PGRH
- PGR
- PGFR
- PGF
- PBC
- PBE
- PAE
- PAC
- PAN
- PGS
- PNS
- PGW

PGCH SERIES





PGCH Single Stage Dimensions



Specifications

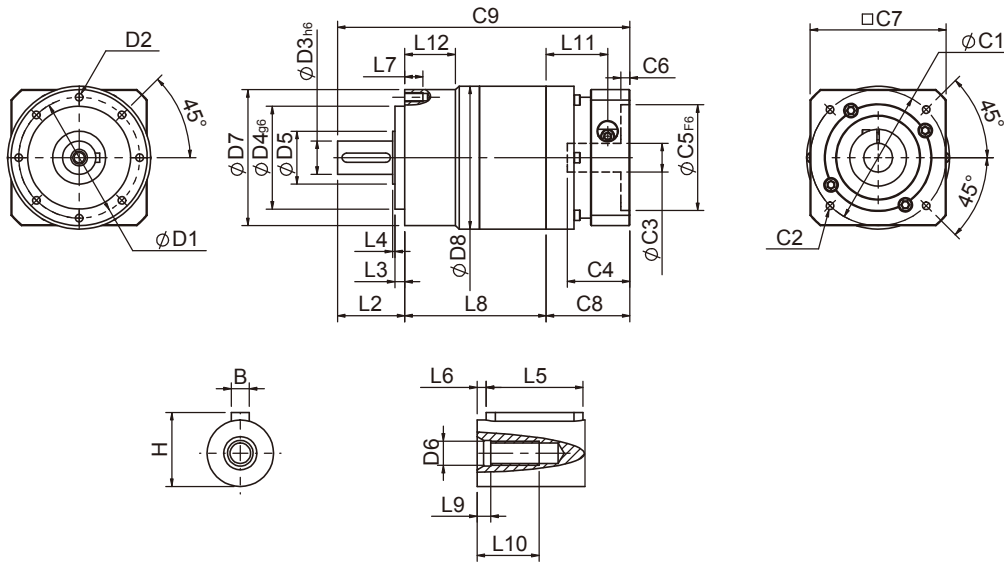
Unit:mm

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

PGCH Double Stage Dimensions-1



Specifications

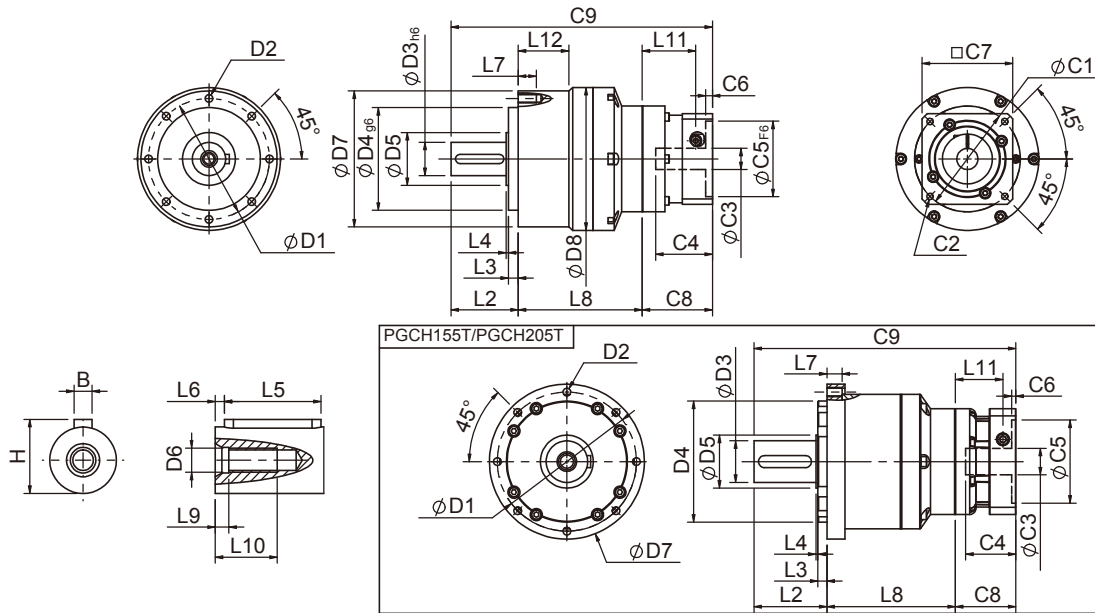
Unit:mm

Dimensions	PGCH50	PGCH70	PGCH90
D1	4	62	80
D2	M4x0.7P	M5x0.8P	M6x1.0P
D3 _{h6}	12	16	22
D4 _{g6}	35	52	68
D5	15	25	35
D6	M4x0.7P	M5x0.8P	M8x1.25P
D7	50	70	90
D8	-	-	94.5
L2	24.5	36	44.5
L3	4	6	6.5
L4	1	1.5	1.5
L5	15	25	32
L6	2	2	3
L7	8	10	12
L8	56.8	71	93.5
L9	4	4	4.5
L10	12	16.5	20.5
L11	29	35.4	40.7
L12	-	-	33.5
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	$\leq 8 / \leq 11$	$\leq 14 / \leq 19$	$\leq 19 / \leq 24$
C4 ²	26.5	37.6	41.4
C5 ² _{F6}	30	50	70
C6 ²	4.1	4.5	6
C7 ²	42	60	90
C8 ²	38.1	46.5	55.4
C9 ²	119.4	153.5	193.4
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.

PGCH Double Stage Dimensions-2



Specifications

Unit:mm

Dimensions	PGCH70T	PGCH90T	PGCH120T	PGCH155T	PGCH205T
D1	62	80	108	140	184
D2	M5x0.8P	M6x1.0P	M8x1.25P	M10x1.5P	M12x1.75P
D3 _{h6}	16	22	32	40	55
D4 _{g6}	52	68	90	120	160
D5	25	35	45	50	70
D6	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P
D7	70	90	120	155	205
D8	-	94.5	-	-	-
L2	36	44.5	60	89.5	96.5
L3	6	6.5	7	8	12
L4	1.5	1.5	3.5	2.5	2.5
L5	25	32	40	60	70
L6	2	3	5	5	6
L7	10	12	16	16	20
L8	66.5	82	102.5	129.5	170
L9	4	4.5	6	6	8
L10	16.5	20.5	30	38	48
L11	29	35.4	40.7	53.7	63
L12	-	33.5	-	-	-
C1 ²	46	70	90	115	145
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P
C3 ²	≤8/≤11	≤14/≤19	≤19/≤24	≤24/≤32/≤38	≤35/≤38
C4 ²	26.5	37.6	41.4	51.3	66.5
C5 ² _{F6}	30	50	70	95	110
C6 ²	4.1	4.5	6	6	5.5
C7 ²	42	60	90	115	140
C8 ²	38.1	46.5	55.4	70	80
C9 ²	140.6	173	217.9	289	346.5
B	5	6	10	12	16
H	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.

PGCH Specifications Table

Specifications		Stage	Ratio	PGCH-50	PGCH-70	PGCH-90	PGCH-120	PGCH-155	PGCH-205	
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	600	1050	
			6	15	46	135	280	560	1000	
			7	14	44	125	270	530	960	
			8	12	41	110	240	480	900	
			9	11	37	95	220	430	800	
		10	11	37	95	220	430	800		
		2	Stage	Ratio	PGCH-50	PGCH-70(T)	PGCH-90(T)	PGCH-120T	PGCH-155T	PGCH-205T
			15	19	53	145	290	520	950	
	20		20	55	150	300	550	1000		
	25		17	54	140	290	600	1050		
	30		17	54	140	290	600	1050		
	35		17	54	140	290	600	1050		
	40		17	54	140	290	600	1050		
	45		17	54	140	290	600	1050		
	50		17	54	140	290	600	1050		
	60		15	46	135	280	560	1000		
	70	14	44	125	270	530	960			
	80	12	41	110	240	480	900			
90	11	37	95	220	430	800				
100	11	37	95	220	430	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	50	145	
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 ²	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	PGCH-50	PGCH-70	PGCH-90	PGCH-120	PGCH-155	PGCH-205		
1	3	Kg · cm ²	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	PGCH-50	PGCH-70(T)	PGCH-90(T)	PGCH-120T	PGCH-155T	PGCH-205T			
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			

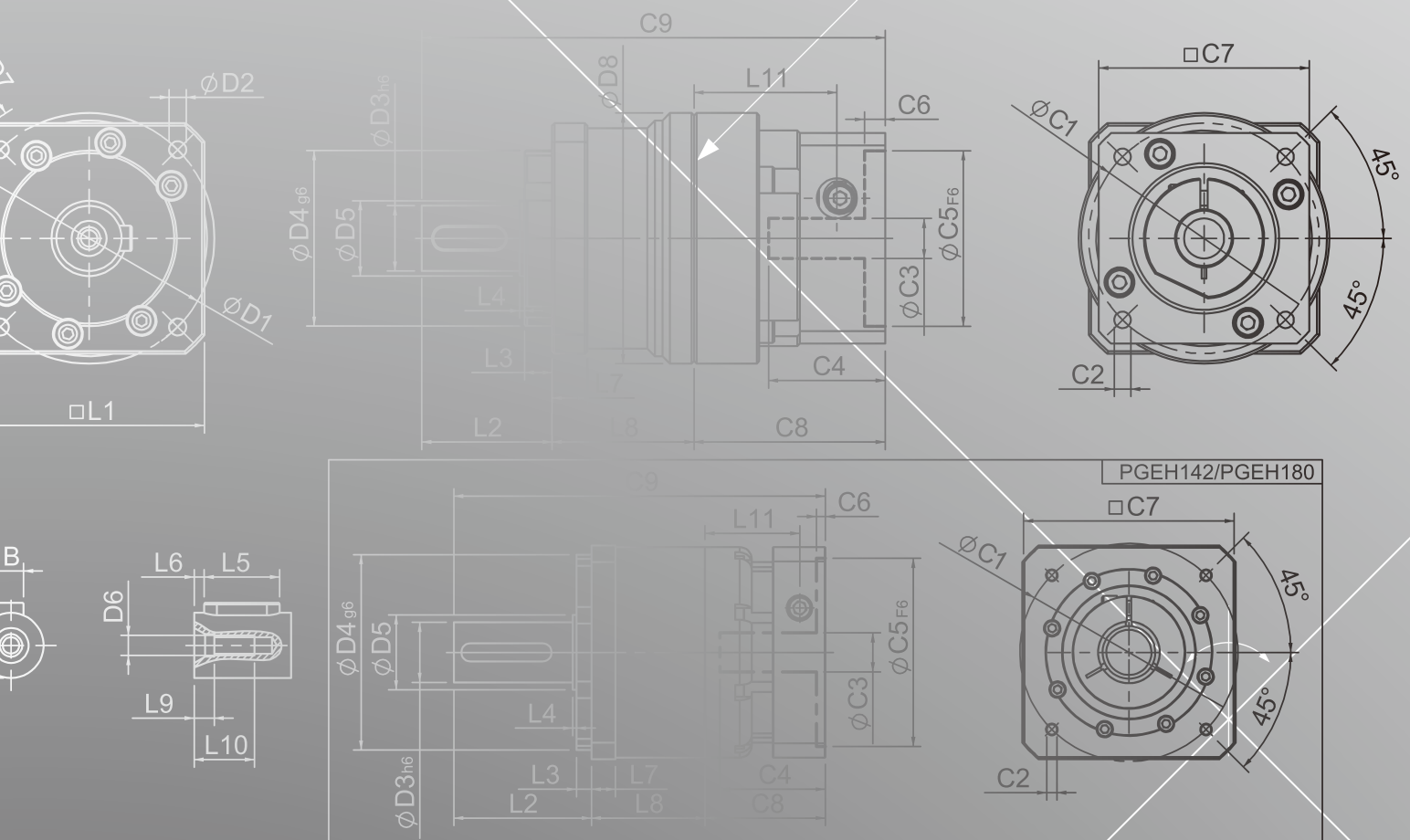
* 1. Applied to the output shaft center at 100 rpm.

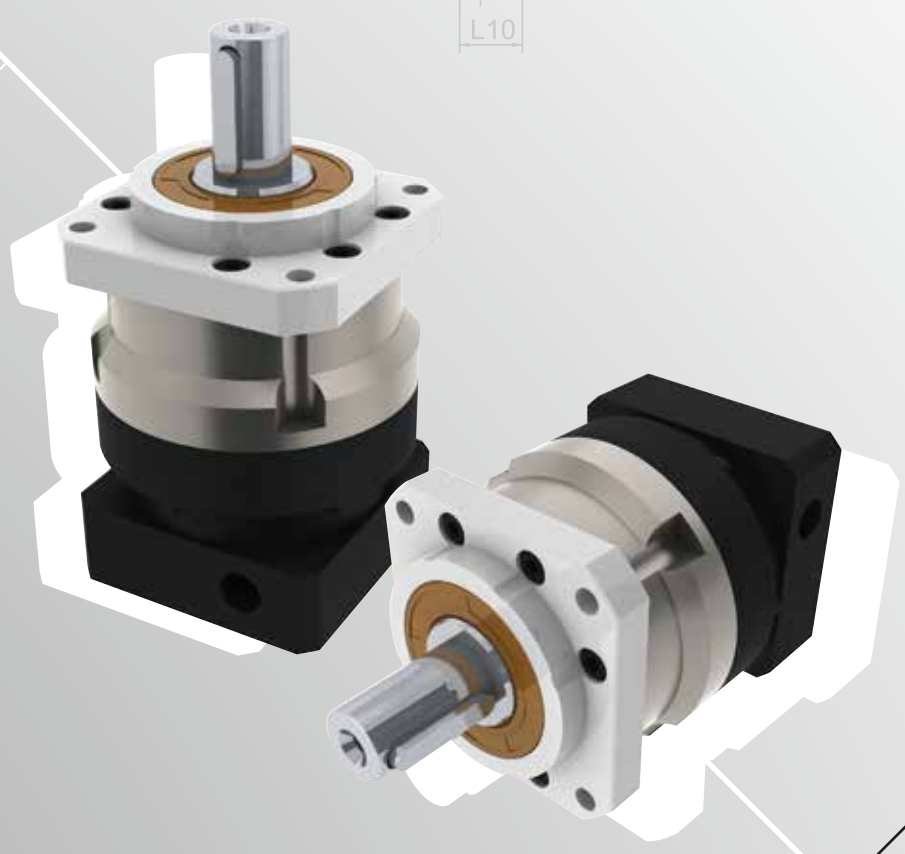
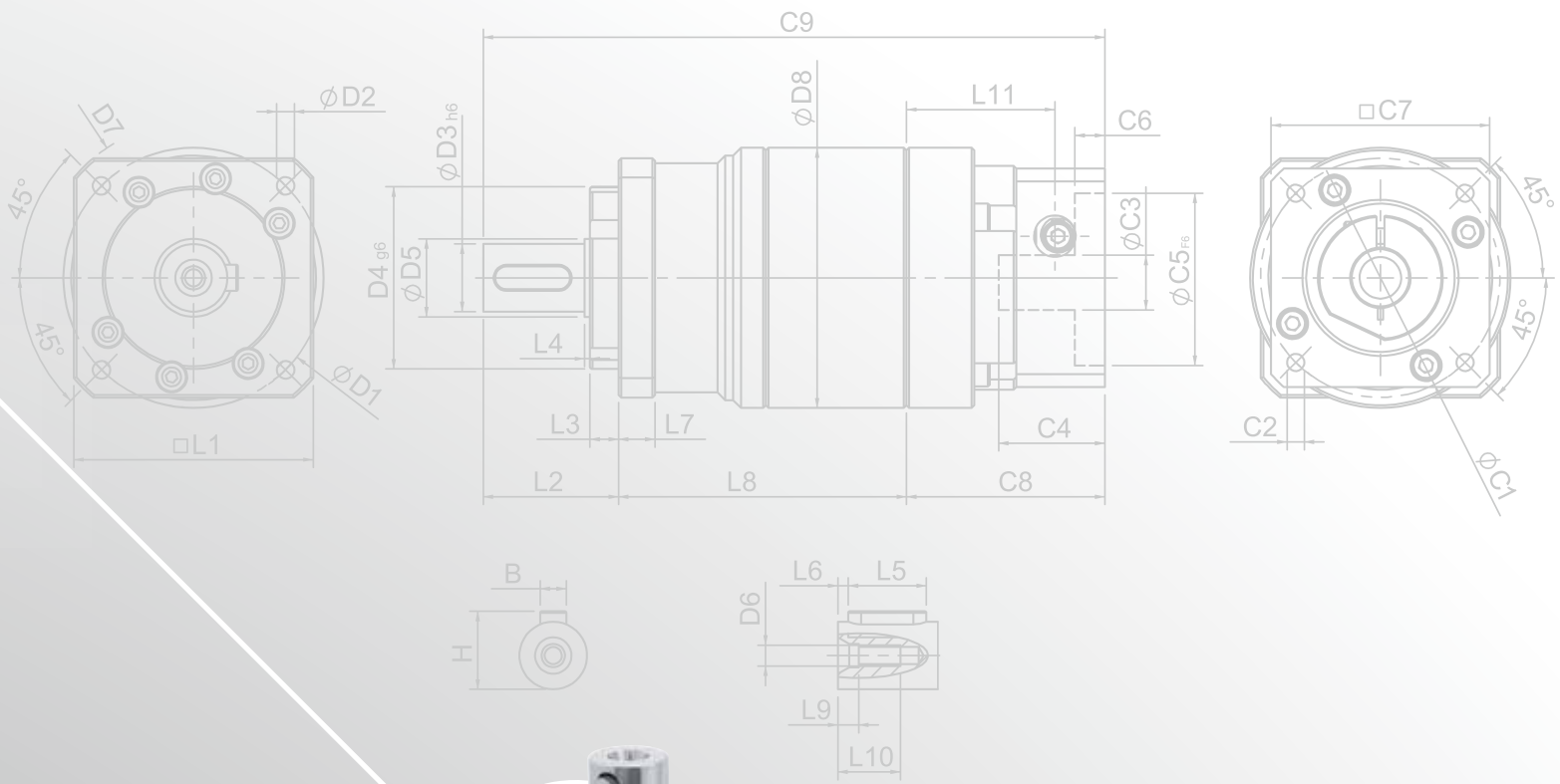
* 2. Measured at 3000 rpm with no load. These values are measured by gearbox with ratio = 10 (1-stage) or ratio = 100 (2-stage) at nominal input speed or 3000 rpm (if nominal input speed is higher than 3000 rpm) with no load.

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

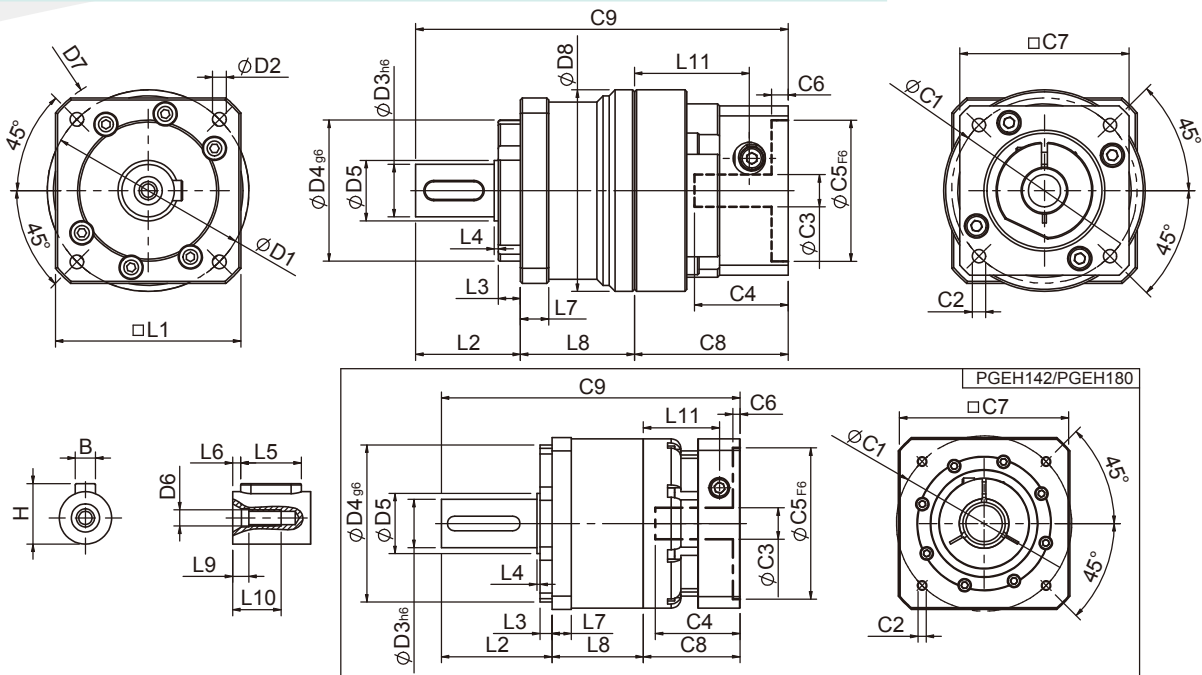
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PGEH SERIES





PGEH Single Stage Dimensions



Specifications

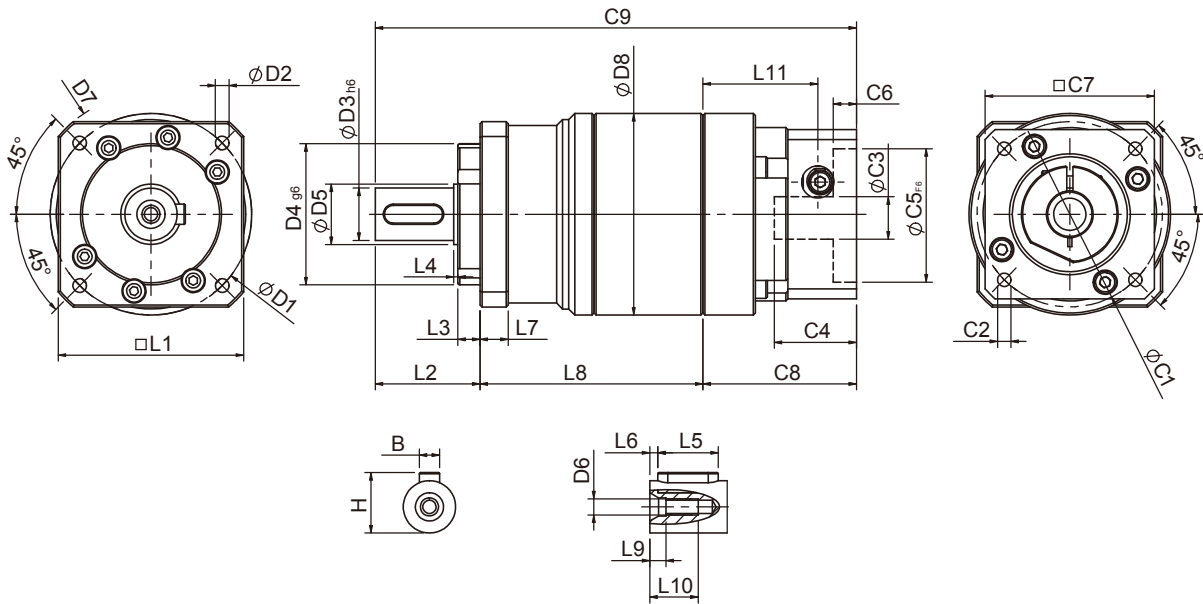
Unit:mm

Dimensions	PGEH50	PGEH70	PGEH90	PGEH120	PGEH142	PGEH180
D1	50	70	100	130	165	215
D2	3.4	5.5	6.8	9	10.5	13
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	60	82	118	148	186	239
D8	50	70	94.5	120	-	-
L1	46	64	90	118	142	182
L2	26	37	43	59	91.5	100.5
L3	5.5	7	5	6	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	7	9.7	13.5	15.7	16	20
L8	28.3	37	51	61	75.5	94
L9	4	4	4.5	6	6	8
L10	12	16.5	20.5	30	38	48
L11	28.5	35.5	40.7	53.8	62.8	70
C1 ²	46	70	90	115	145	200
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 ²	≤8/≤11	≤14/≤19	≤19/≤24	≤24/≤32/≤38	≤35/≤38	≤50
C4 ²	26.5	37.6	41.4	51.3	66.5	82
C5 ² _{F6}	30	50	70	95	110	114.3
C6 ²	4.1	4.5	6	6	5.5	10
C7 ²	42	60	90	115	140	180
C8 ²	38.1	46.5	55.4	70	80	95
C9 ²	92.4	120.5	149.4	190	247	289.5
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.

PGEH Double Stage Dimensions-1



Specifications

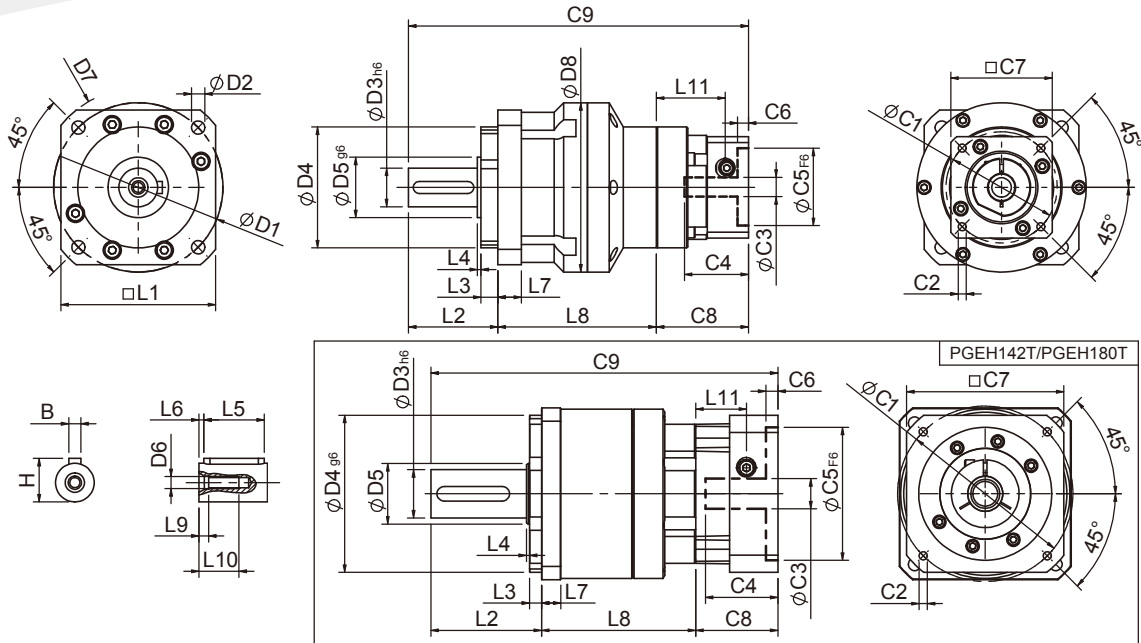
Unit:mm

Dimensions	PGEH50	PGEH70	PGEH90
D1	50	70	100
D2	3.4	5.5	6.8
D3 _{h6}	13	16	22
D4 _{g6}	35	50	80
D5	15	25	35
D6	M4x0.7P	M5x0.8P	M8x1.25P
D7	60	82	118
D8	50	70	94.5
L1	46	64	90
L2	26	37	43
L3	5.5	7	5
L4	1	1.5	1.5
L5	15	25	32
L6	2	2	3
L7	7	9.7	13.5
L8	55.3	70	95
L9	4	4	4.5
L10	12	16.5	20.5
L11	28.5	35.5	40.7
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	≤8/≤11	≤14/≤19	≤19/≤24
C4 ²	26.5	37.6	41.4
C5 ² _{F6}	30	50	70
C6 ²	4.1	4.5	6
C7 ²	42	60	90
C8 ²	38.1	46.5	55.4
C9 ²	119.4	153.5	193.4
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.

PGEH Double Stage Dimensions-2



Specifications

Unit:mm

Dimensions	PGEH70T	PGEH90T	PGEH120T	PGEH142T	PGEH180T
D1	70	100	130	165	215
D2	5.5	6.8	9	10.5	13
D3 _{he}	16	22	32	40	55
D4 _{g6}	50	80	110	130	160
D5	25	35	45	50	70
D6	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P
D7	82	118	148	186	239
D8	70	94.5	120	-	-
L1	64	90	118	142	182
L2	37	43	59	91.5	100.5
L3	7	5	6	10	16
L4	1.5	1.5	3.5	2.5	2.5
L5	25	32	40	60	70
L6	2	3	5	5	6
L7	9.7	13.5	15.7	16	20
L8	65.5	83.5	103.5	127.5	166
L9	4	4.5	6	6	8
L10	16.5	20.5	30	38	48
L11	28.5	35.5	40.7	41.8	62.8
C1 ²	46	70	90	115	145
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P
C3 ²	≤8/≤11	≤14/≤19	≤19/≤24	≤24/≤32/≤38	≤35
C4 ²	26.5	37.6	41.4	56	66.5
C5 ² _{F6}	30	50	70	95	110
C6 ²	4.1	4.5	6	10	5.5
C7 ²	42	60	90	115	140
C8 ²	38.1	46.5	55.4	63	80
C9 ²	140.6	173	217.9	282	346.5
B	5	6	10	12	16
H	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.

PGEH Specifications Table

Specifications		Stage	Ratio	PGEH-50	PGEH-70	PGEH-90	PGEH-120	PGEH-142	PGEH-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	600	1050	
			6	15	46	135	280	560	1000	
			7	14	44	125	270	530	960	
			8	12	41	110	240	480	900	
			9	11	37	95	220	430	800	
		10	11	37	95	220	430	800		
		2	Stage	Ratio	PGEH-50	PGEH-70(T)	PGEH-90(T)	PGEH-120T	PGEH-142T	PGEH-180T
			15	19	53	145	290	520	950	
	20		20	55	150	300	550	1000		
	25		17	54	140	290	600	1050		
	30		17	54	140	290	600	1050		
	35		17	54	140	290	600	1050		
	40		17	54	140	290	600	1050		
	45		17	54	140	290	600	1050		
	50		17	54	140	290	600	1050		
	60		15	46	135	280	560	1000		
	70	14	44	125	270	530	960			
80	12	41	110	240	480	900				
90	11	37	95	220	430	800				
100	11	37	95	220	430	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	50	145	
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 ²	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	PGEH-50	PGEH-70	PGEH-90	PGEH-120	PGEH-142	PGEH-180		
1	3	Kg · cm ²	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	PGEH-50	PGEH-70(T)	PGEH-90(T)	PGEH-120T	PGEH-142T	PGEH-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			

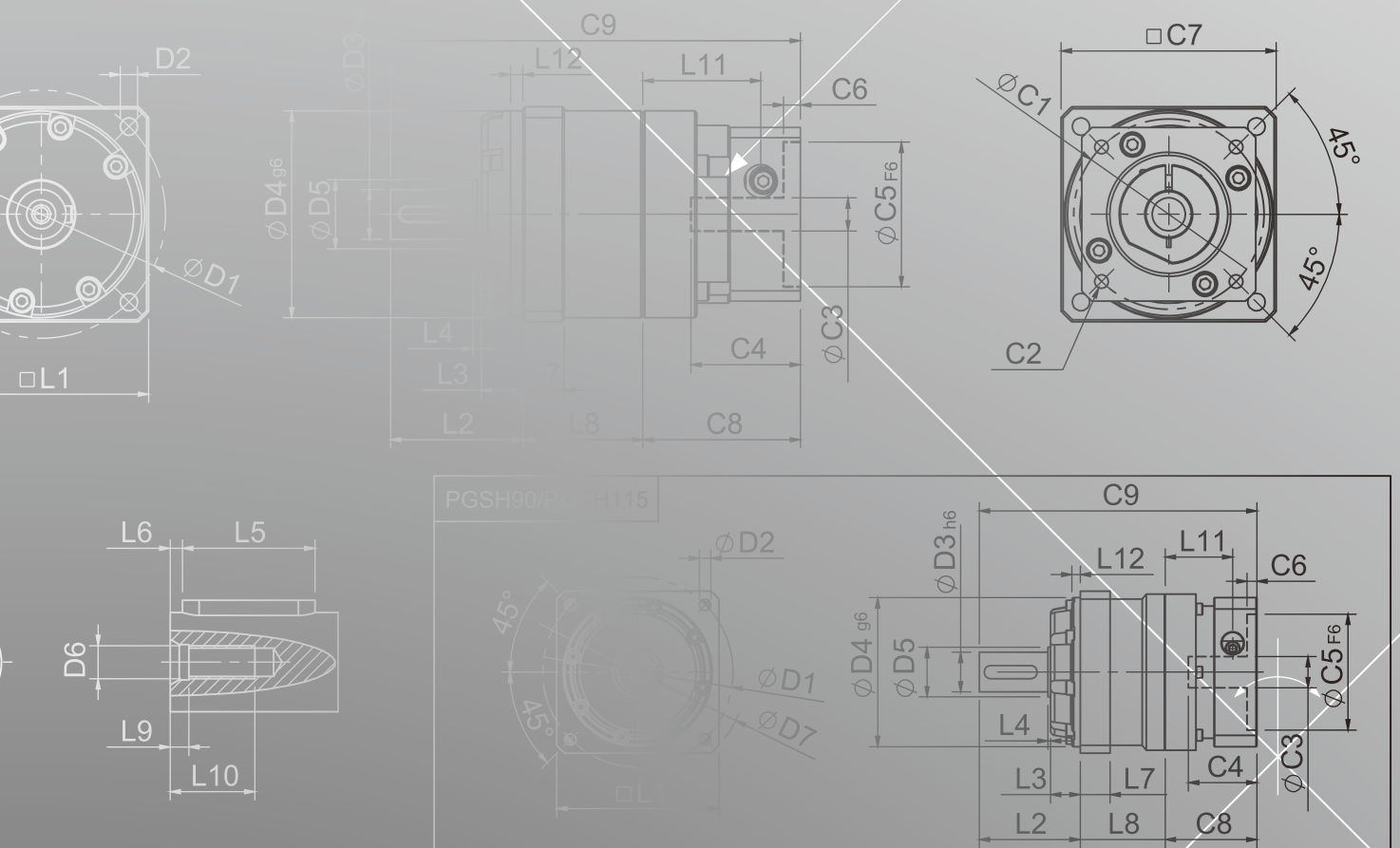
* 1. Applied to the output shaft center at 100 rpm.

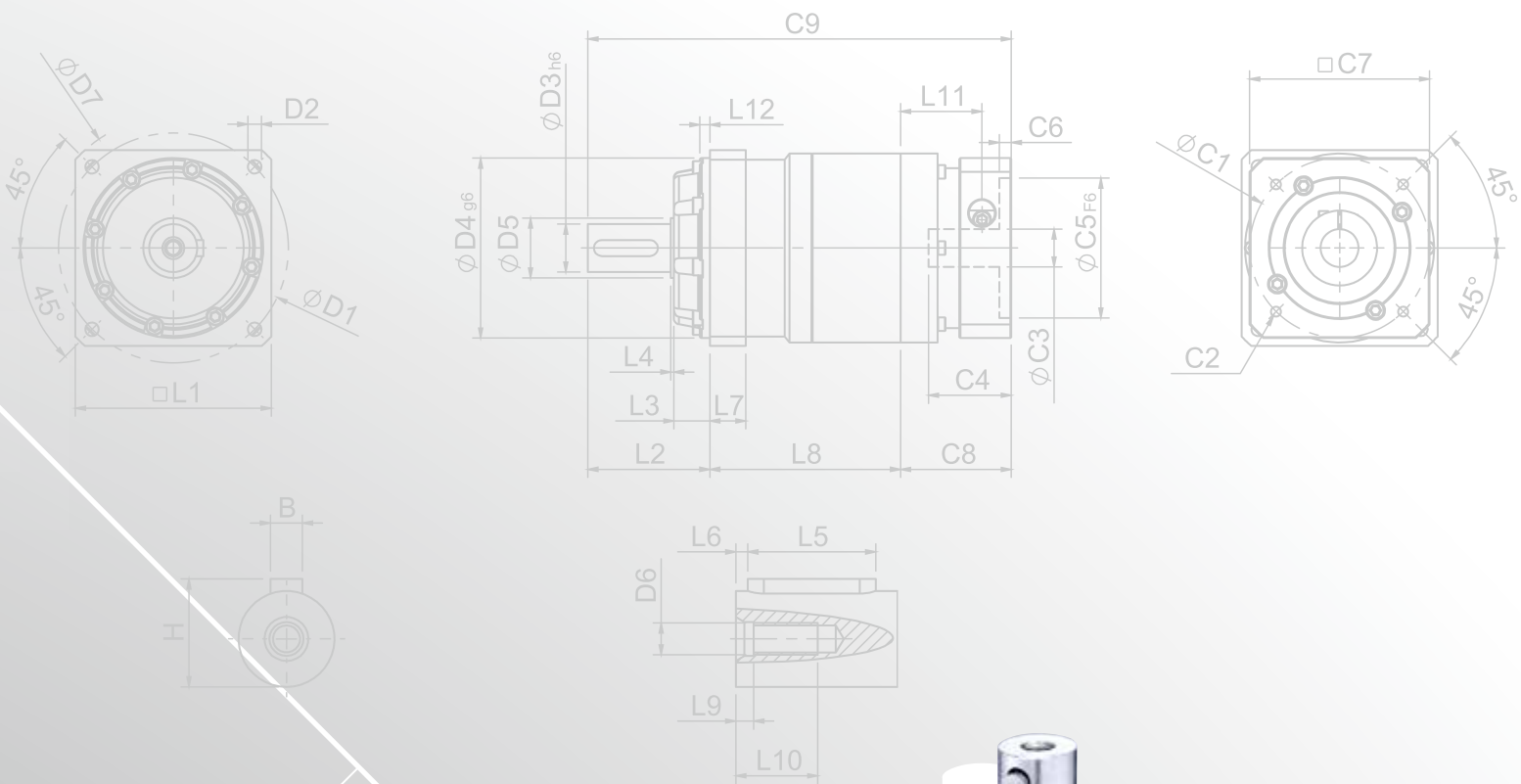
* 2. Measured at 3000 rpm with no load. These values are measured by gearbox with ratio = 10 (1-stage) or ratio = 100 (2-stage) at nominal input speed or 3000 rpm (if nominal input speed is higher than 3000 rpm) with no load.

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

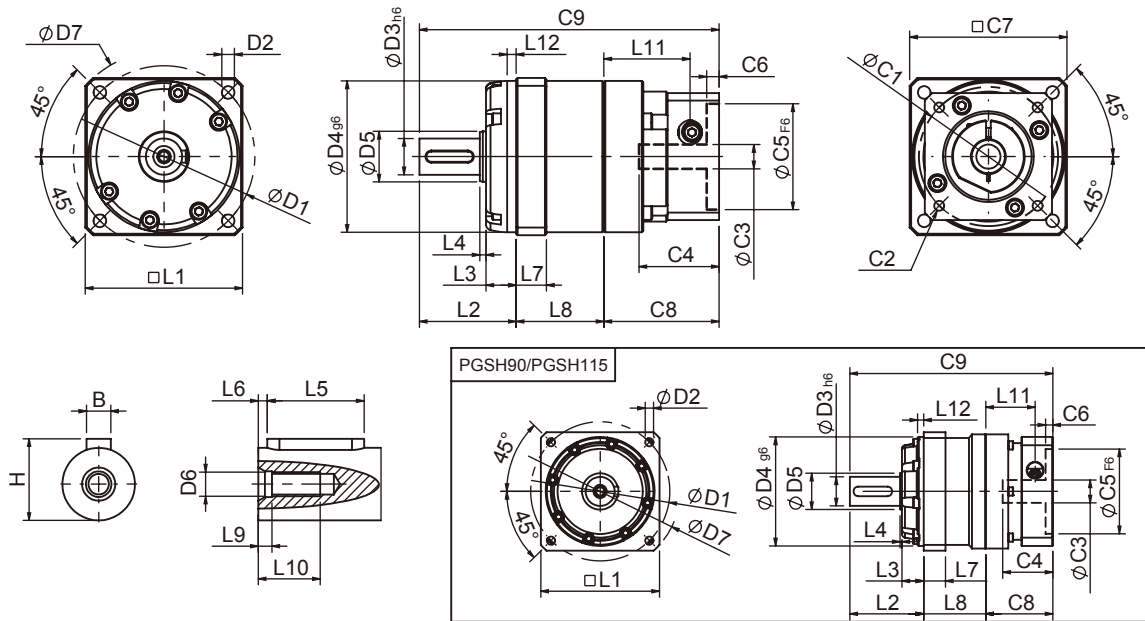
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PGSH SERIES





PGSH Single Stage Dimensions



Specifications

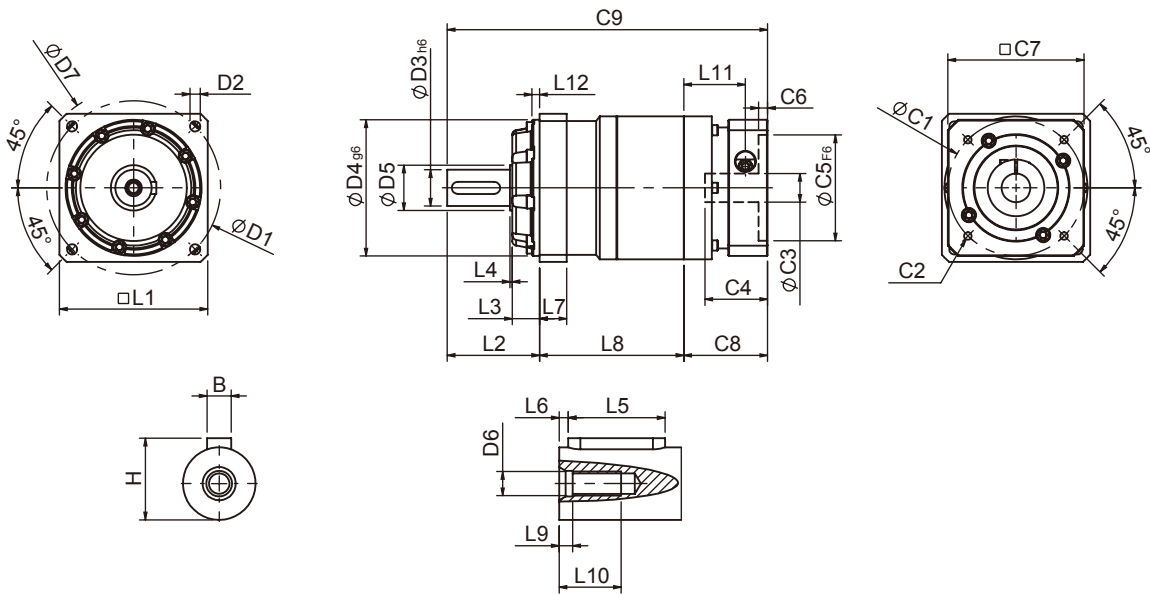
Unit:mm

Dimensions	PGSH42	PGSH60	PGSH90	PGSH115
D1	60	90	115	135
D2	M5x0.8P	M6x1.0P	M8x1.25P	M10x1.5P
D3 _{h6}	12	19	24	32
D4 _{g6}	50	70	90	110
D5	16.7	20	30	45
D6	M4x0.7P	M6x1.0P	M8x1.25P	M12x1.75P
D7	70	104	132	164
L1	52	78	98	120
L2	32	50	61	75
L3	10	17	18	14.5
L4	2	3	1.5	5.5
L5	16	25	32	40
L6	2	3	3	5
L7	10	12	18	18.5
L8	29	37.8	51.4	63.8
L9	4	4	4.5	6
L10	12	16.5	20.5	30
L11	28.5	35.5	40.7	53.8
L12	3	4	5	5
C1 ²	46	70	90	115
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P
C3 ²	≤8/≤11	≤14/≤19	≤19/≤24	≤24/≤32/≤38
C4 ²	26.5	37.6	41.4	51.3
C5 ² _{F6}	30	50	70	95
C6 ²	4.1	4.5	6	6
C7 ²	42	60	90	115
C8 ²	38.1	46.5	55.4	70
C9 ²	99.1	134.3	167.8	208.8
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.

PGSH Double Stage Dimensions-1



Specifications

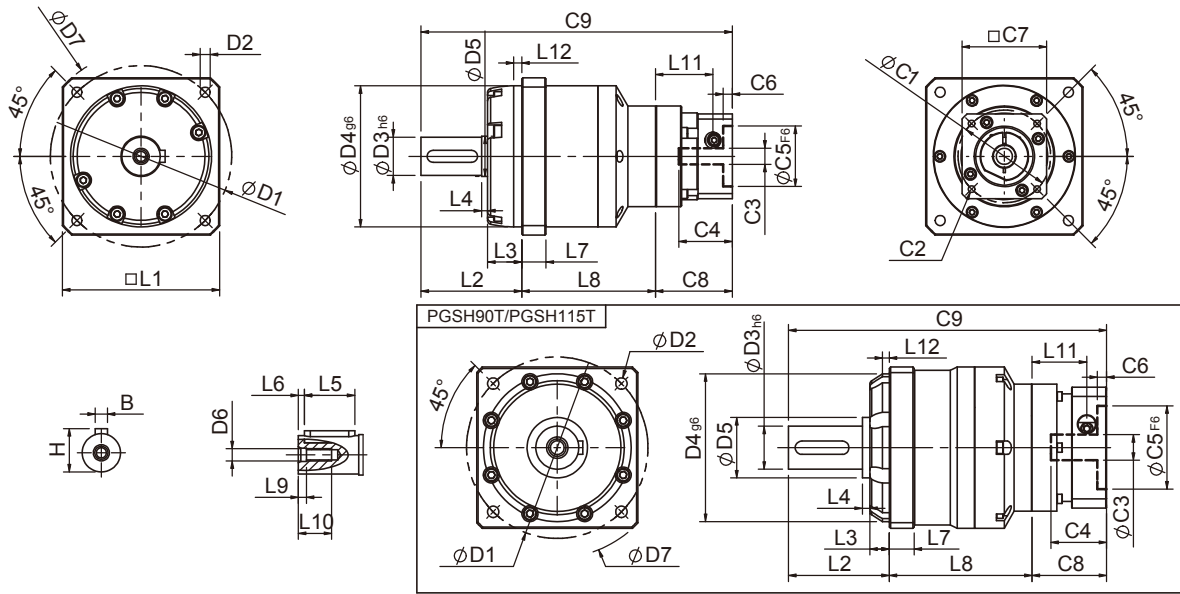
Unit:mm

Dimensions	PGSH42	PGSH60	PGSH90
D1	60	90	115
D2	M5x0.8P	M6x1.0P	M8x1.25P
D3 _{h6}	12	19	24
D4 _{g6}	50	70	90
D5	16.7	20	30
D6	M4x0.7P	M6x1.0P	M8x1.25P
D7	70	104	132
L1	52	78	98
L2	32	50	61
L3	10	17	18
L4	2	3	1.5
L5	16	25	32
L6	2	3	3
L7	10	12	18
L8	56	70.8	95.4
L9	4	4	4.5
L10	12	16.5	20.5
L11	28.5	35.5	40.7
L12	3	4	5
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	≤8/≤11	≤14/≤19	≤19/≤24
C4 ²	26.5	37.6	41.4
C5 ² _{F6}	30	50	70
C6 ²	4.1	4.5	6
C7 ²	42	60	90
C8 ²	38.1	46.5	55.4
C9 ²	126.1	167.3	211.8
B	4	6	8
H	13.5	21.5	27

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

★ Specification subject to change without notice.

PGSH Double Stage Dimensions-2



Specifications

Unit:mm

Dimensions	PGSH60T	PGSH90T	PGSH115T
D1	90	115	135
D2	M6x1.0P	M8x1.25P	M10x1.5P
D3 _{h6}	19	24	32
D4 _{g6}	70	90	110
D5	20	30	45
D6	M6x1.0P	M8x1.25P	M12x1.75P
D7	104	132	164
L1	78	98	120
L2	50	61	75
L3	17	18	14.5
L4	3	1.5	5.5
L5	25	32	40
L6	3	3	5
L7	12	18	18.6
L8	66.3	83.9	106.5
L9	4	4.5	6
L10	16.5	20.5	30
L11	28.5	35.5	40.7
L12	4	5	5
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	≤8/≤11	≤14/≤19	≤19/≤24
C4 ²	26.5	37.6	41.4
C5 ² _{F6}	30	50	70
C6 ²	4.1	4.5	6
C7 ²	42	60	90
C8 ²	38.1	46.5	55.4
C9 ²	154.4	191.4	236.7
B	6	8	10
H	21.5	27	35

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

★ Specification subject to change without notice.

PGSH Specifications Table

Specifications		Stage	Ratio	PGSH-42A	PGSH-42	PGSH-60	PGSH-90	PGSH-115	PGSH-142
Nominal Output Torque T_{2N}	N · m	1	3	8	15	53	145	290	520
			4	10	17	55	150	300	550
			5	10	16	54	140	290	600
			6	10	15	46	135	280	560
			7	10	14	44	125	270	530
			8	9	12	41	110	240	480
			9	9	11	37	95	220	430
			10	9	11	37	95	220	430
		Stage	Ratio	PGSH-42A	PGSH-42	PGSH-60 / PGSH-60T	PGSH-90 / PGSH-90T	PGSH-115T	PGSH-142T
		2	15	8	15	53	145	290	520
			20	10	17	55	150	300	550
			25	10	16	54	140	290	600
			30	10	16	54	140	290	600
			35	10	16	54	140	290	600
			40	10	16	54	140	290	600
			45	10	16	54	140	290	600
			50	10	16	54	140	290	600
			60	10	15	46	135	280	560
			70	10	14	44	125	270	530
80	9		12	41	110	240	480		
90	9	11	37	95	220	430			
100	9	11	37	95	220	430			
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	4000	3000	3000	2500
Max. Input Speed n_{1max}	rpm	1,2	3-100	8000	8000	8000	6000	6000	5000
Precision Backlash P_1	arcmin	1	3-10	≤ 6	≤ 6	≤ 6	≤ 6	≤ 5	≤ 5
		2	12-100	≤ 8	≤ 8	≤ 8	≤ 8	≤ 7	≤ 7
Standard Backlash P_2	arcmin	1	3-10	≤ 8	≤ 8	≤ 8	≤ 8	≤ 7	≤ 7
		2	12-100	≤ 10	≤ 10	≤ 10	≤ 10	≤ 9	≤ 9
Torsional Rigidity	N · m / arcmin	1,2	3-100	2.5	2.5	6	12	23	50
Max. Radial Load F_{2rB}^1	N	1,2	3-100	1120	1120	1720	2800	4600	8300
Max. Axial Load F_{2aB}^1	N	1,2	3-100	520	520	830	1730	2950	4670
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	0.6	1.3	3.5	7.8	16.1
		2	12-100	0.9	0.9	2.0/1.6	5.6/3.9	9.5	19
Mounting Position	-	1,2	3-100	Any Direction					
Noise Level ²	dB(A)/1m	1,2	3-100	58	58	60	63	65	67
Protection Class	-	1,2	3-100	IP65					
Lubrication	-	1,2	3-100	Synthetic Lubricant					
Inertia (J1)									
Stage	Ratio	unit	PGSH-42A	PGSH-42	PGSH-60	PGSH-90	PGSH-115	PGSH-142	
1	3	Kg · cm ²	0.03	0.03	0.23	0.97	2.35	10.00	
	4		0.02	0.02	0.18	0.67	1.66	7.17	
	5		0.02	0.02	0.17	0.65	1.50	6.52	
	6/7/8		0.02	0.02	0.14	0.60	1.45	6.17	
	9/10		0.02	0.02	0.14	0.58	1.41	6.10	
Stage	Ratio	PGSH-42A	PGSH-42	PGSH-60(T)	PGSH-90(T)	PGSH-115T	PGSH-142T		
2	15/20/25	0.02	0.02	0.17(0.02)	0.65(0.17)	0.65	1.50		
	30/35/40	0.02	0.02	0.14(0.02)	0.60(0.14)	0.60	1.45		
	45/50/60/70/80/90/100	0.02	0.02	0.14(0.02)	0.58(0.14)	0.58	1.41		

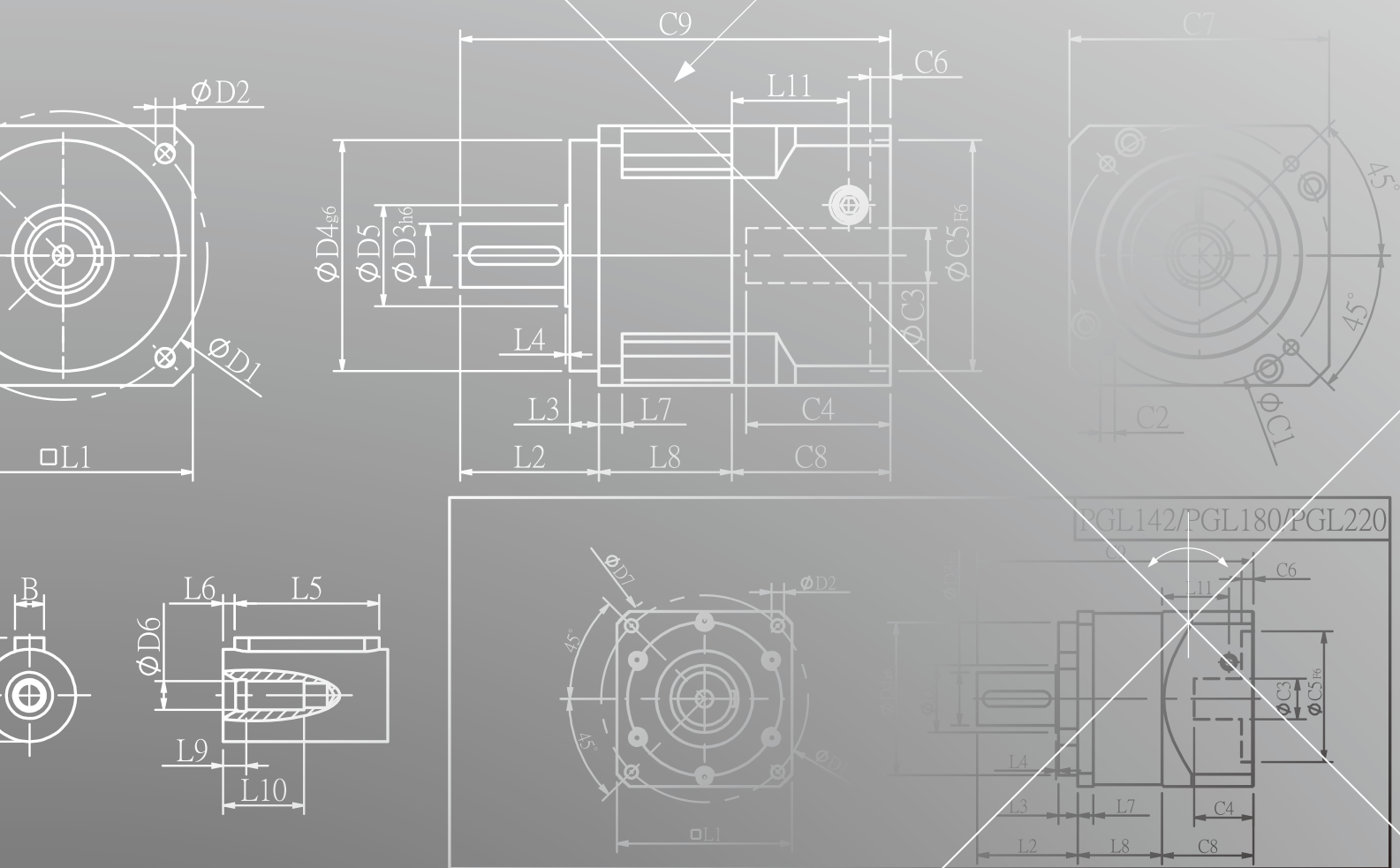
* 1. Applied to the output shaft center at 100 rpm.

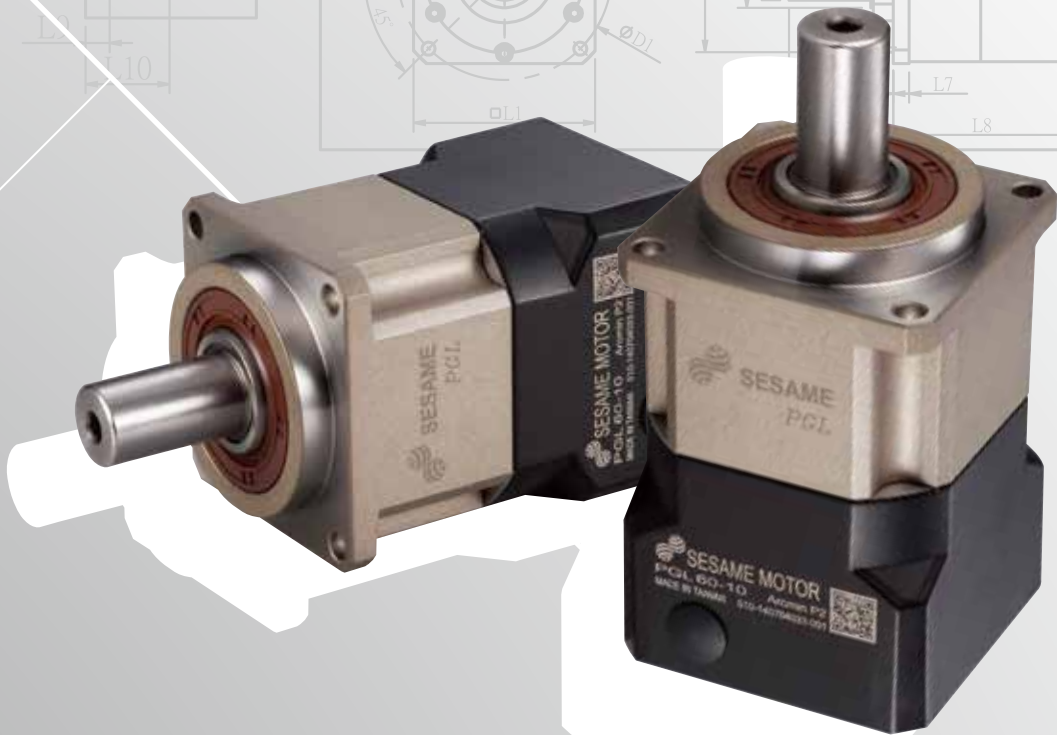
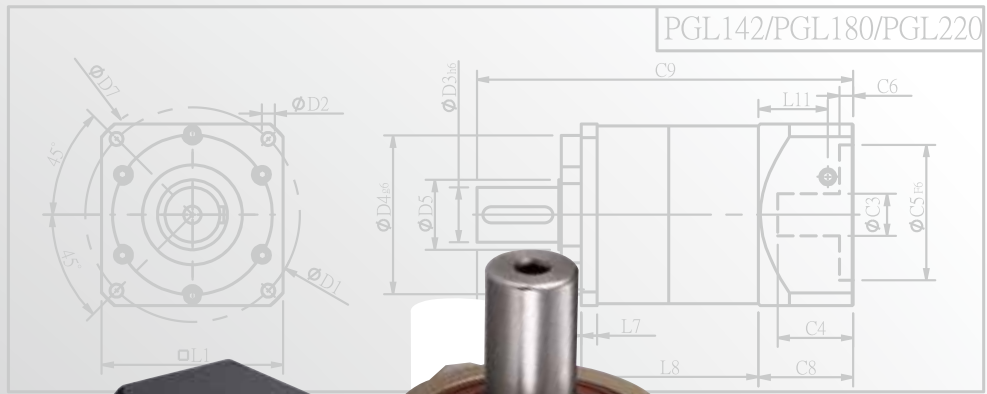
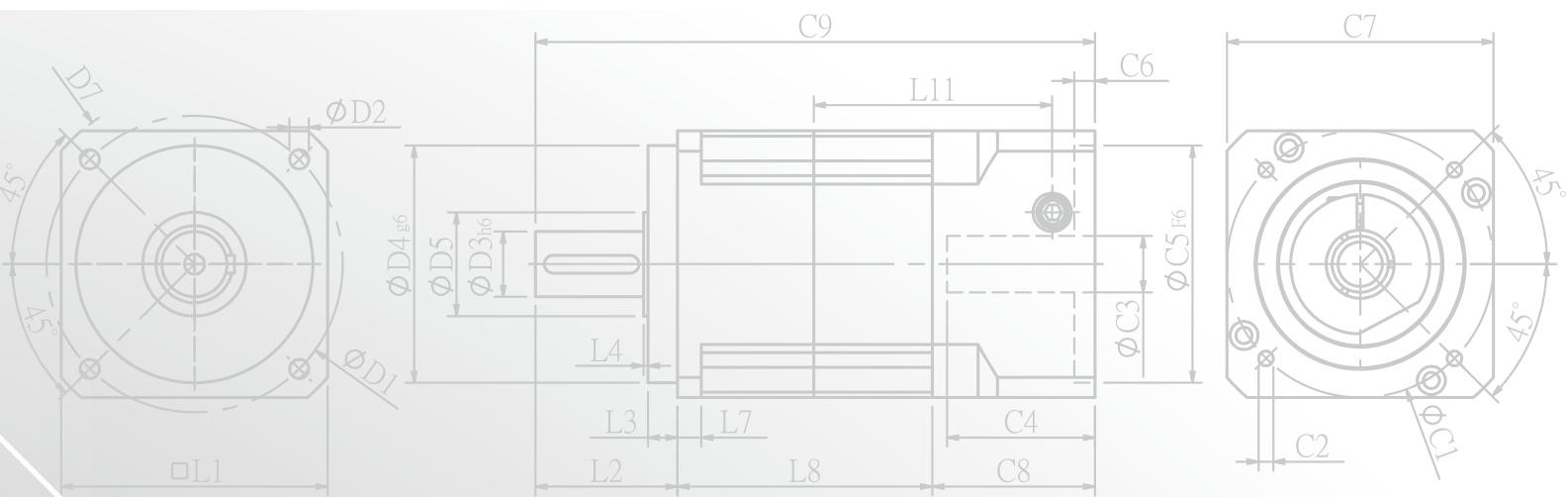
* 2. Measured at 3000 rpm with no load. These values are measured by gearbox with ratio = 10 (1-stage) or ratio = 100 (2-stage) at nominal input speed or 3000 rpm (if nominal input speed is higher than 3000 rpm) with no load.

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

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

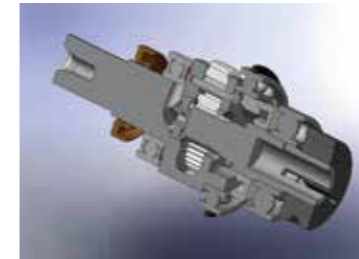
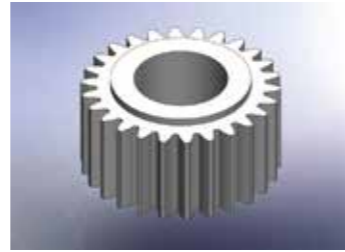
PGL SERIES





PGL SERIES FEATURES

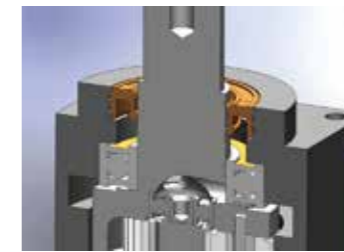
Alloy steel gear with unique heat treatment. Additionally, with gear grinding processing to get the best accuracy, high wear resistance and high impact toughness.



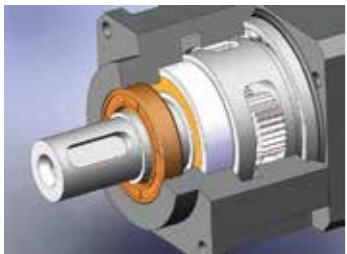
The sun gear bearing is placed directly into the planetary arm bracket, the overall mechanical structure designed to ensure concentricity of the transmission components.



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.

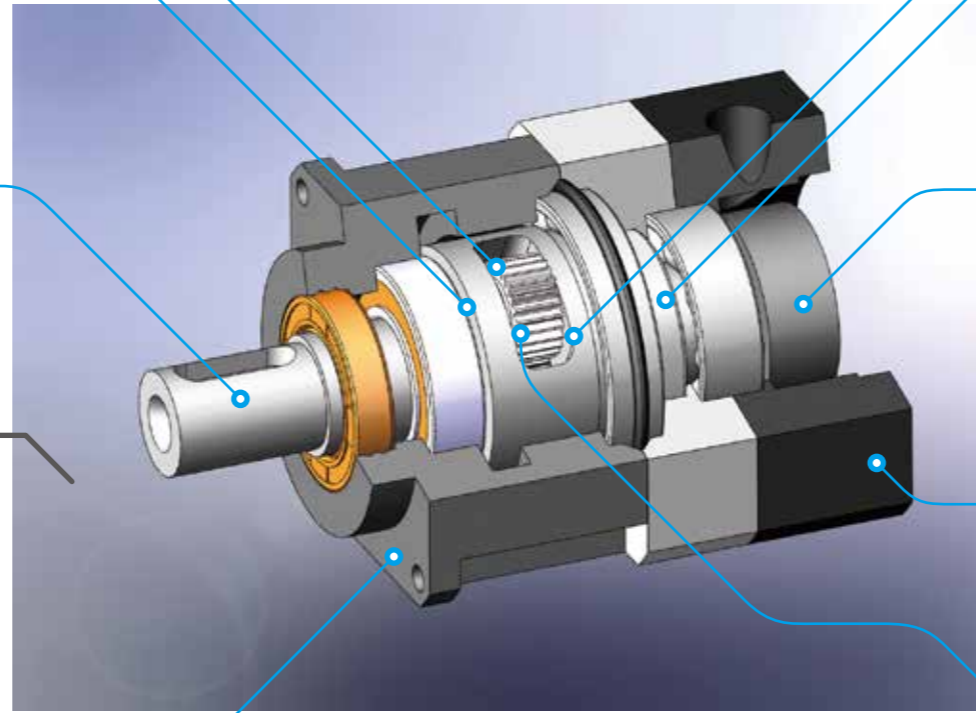


High-tech oil seal design on the upper lip guard against dust intruder, lower lip to guard against oil leak. Advanced lubricants grease and IP65 protection safeguards fully avoid leaking and given it maintenance-free.

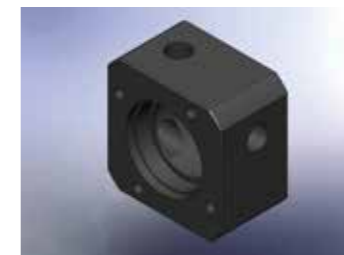


Grinding process to smooth surface of output shaft, and with oil-seal to minimum friction coefficient and reducing start up load; result in the best seal-ability and extended lifespan.

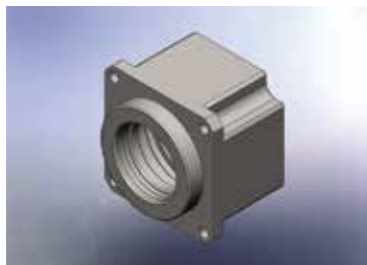
PGL Series overall design suitable for combination operation with servo motor high-speed input and achieves maximum torque output. Precision gear design and gear processing, create a low backlash operation, high efficiency, low noise and long-life of the planetary gear.



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.



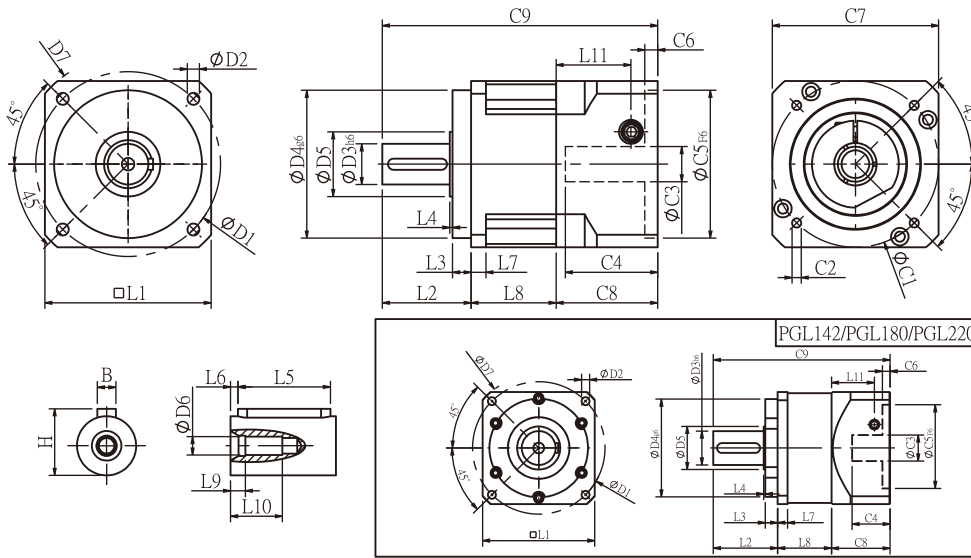
Advanced electroless nickel plating surface treatment resists scratch and corrosion. Suitable for stringent require of high-tech equipment. The gear box and internal gear ring are one-piece constructed, and then processed with advanced Germany gear shaper machinery for high-precision, high torque and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

PGL Single Stage Dimensions



Specifications

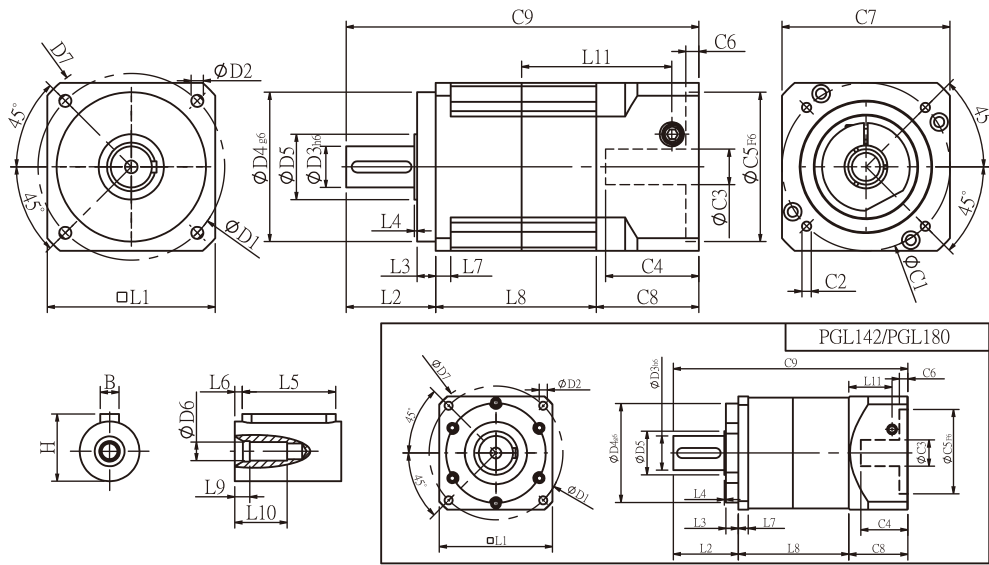
Unit:mm

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

★ Specification subject to change without notice.

PGL Double Stage Dimensions-1



Specifications

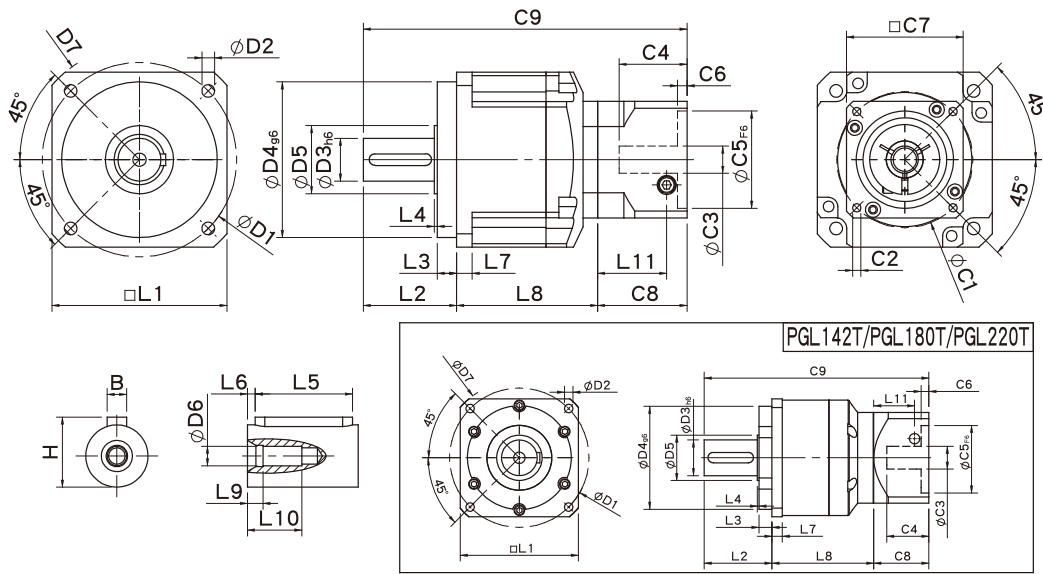
Unit:mm

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 ²	46	70	90	115	145	200
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 ²	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50
C4 ²	27	37	47	58	66	82
C5 ² _{F6}	30	50	70	95	110	114.3
C6 ²	4	4	6	10	6	13
C7 ²	42.6	60	90	115	140	182
C8 ²	38.5	46	55	63	80	95
C9 ²	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 motor flange.

★ Specification subject to change without notice.

PGL Double Stage Dimensions-2



Specifications

Unit:mm

Dimensions	PGL60T	PGL90T	PGL115T	PGL142T	PGL180T	PGL220T
D1	70	100	130	165	215	250
D2	5.5	6.5	8.5	10.5	13	17
D3 _{h6}	16	22	32	40	55	75
D4 _{g6}	50	80	110	130	160	180
D5	25	35	45	50	70	90
D6	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	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 ²	46	70	90	115	145	200
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 ²	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50
C4 ²	27	37	47	58	66	82
C5 ² _{F6}	30	50	70	95	110	114.3
C6 ²	4	4	6	10	6	13
C7 ²	42.6	60	90	115	140	182
C8 ²	38.5	46	55	63	80	95
C9 ²	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 motor flange.

★ 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	
			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		
	45	13.8		43.0	95.2	283	473	1151	1670		
	50	13.8		43.0	95.2	283	473	1151	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	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		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 ²	dBA/1m	1,2	3-100	60	62	65	65	70	70	75	
Protection Class	-	1,2	3-100	IP65							
Lubrication	-	1,2	3-100	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 ²		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)	

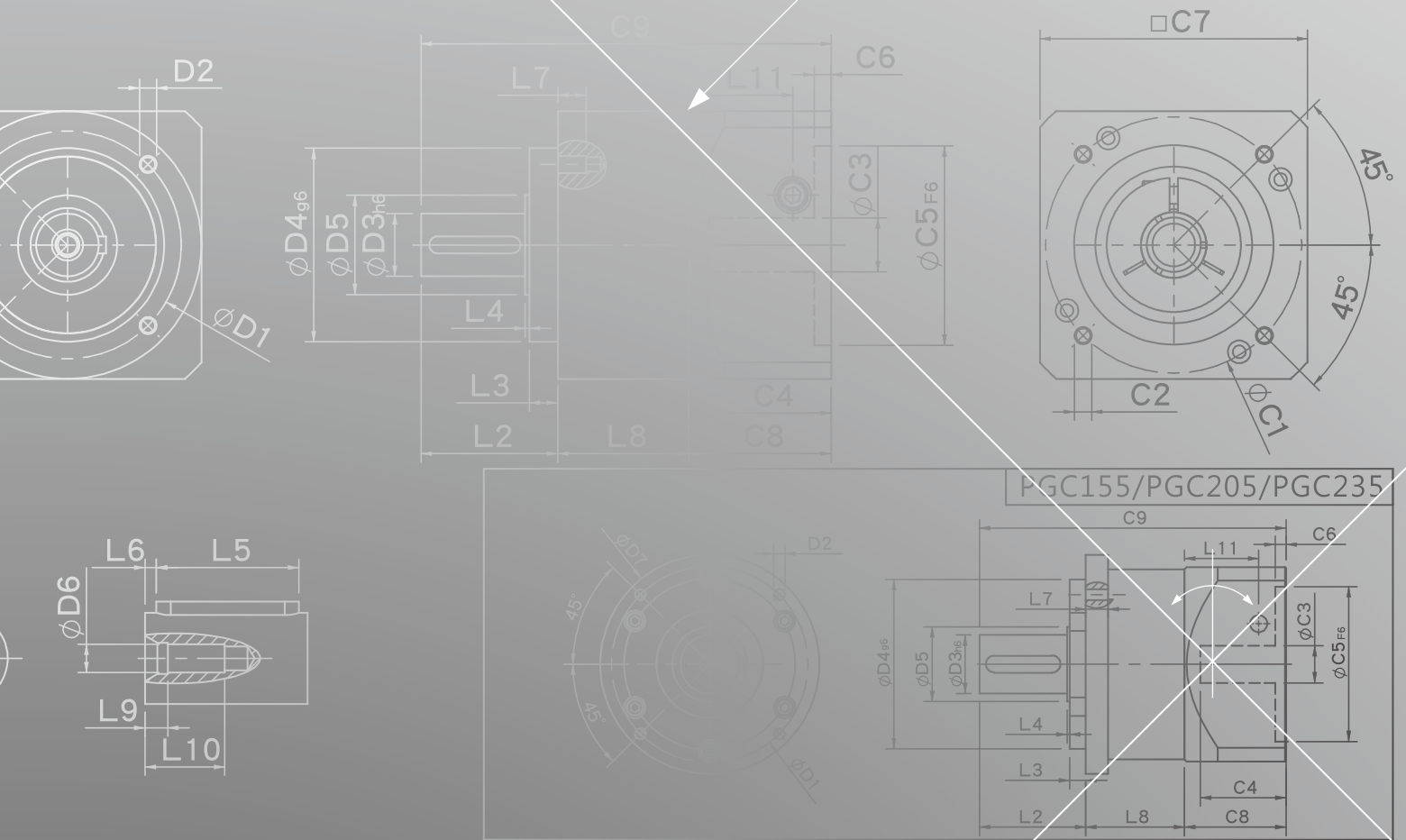
* 1. Applied to the output shaft center at 100 rpm.

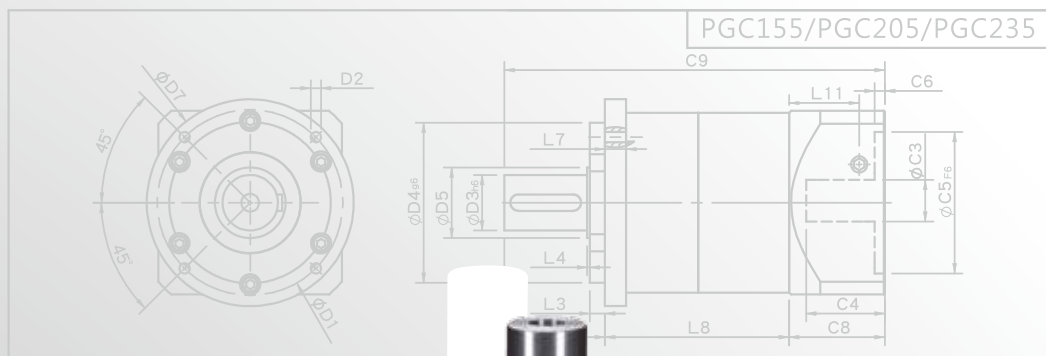
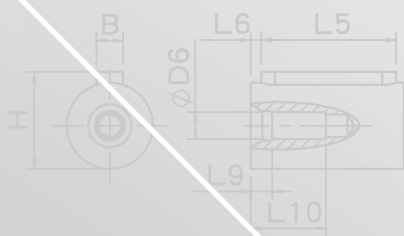
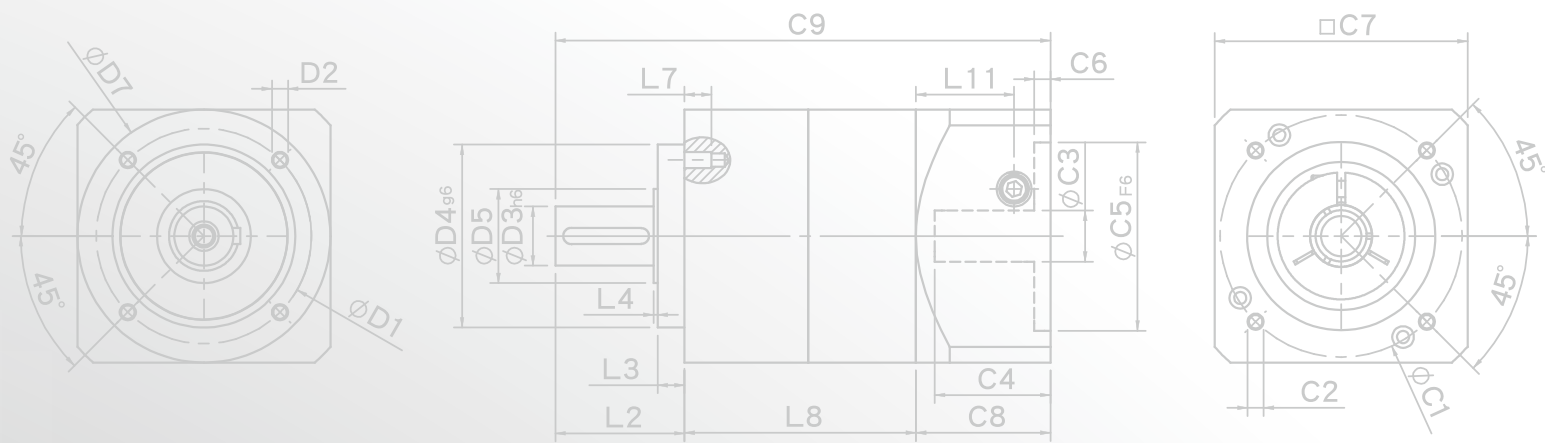
* 2. Measured at 3000 rpm with no load. These values are measured by gearbox with ratio = 10 (1-stage) or ratio = 100 (2-stage) at nominal input speed or 3000 rpm (if nominal input speed is higher than 3000 rpm) with no load.

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

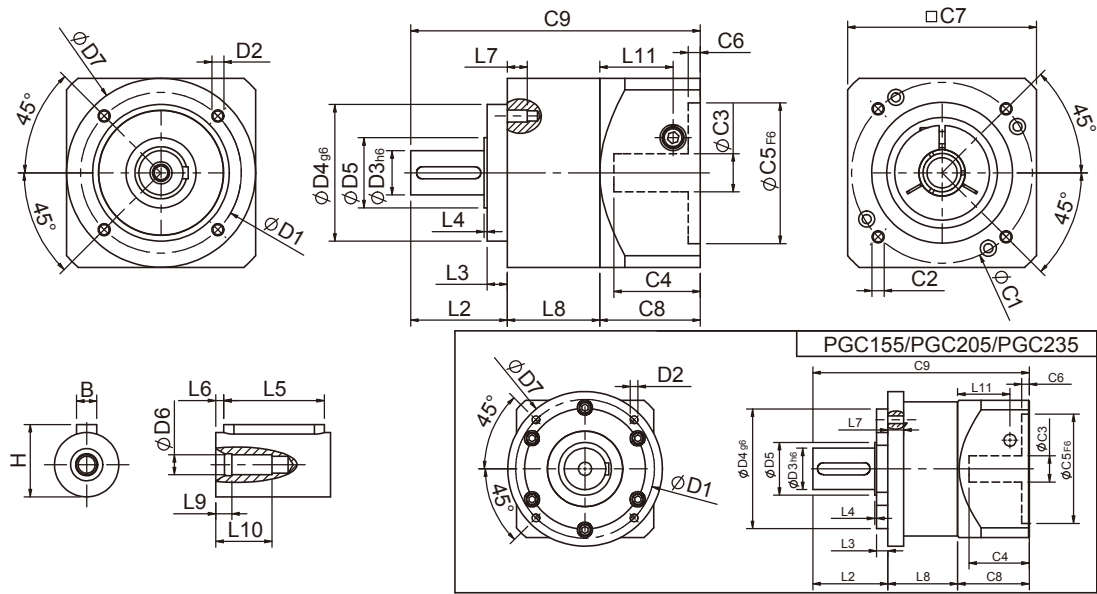
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PGC SERIES





PGC Single Stage Dimensions



Specifications

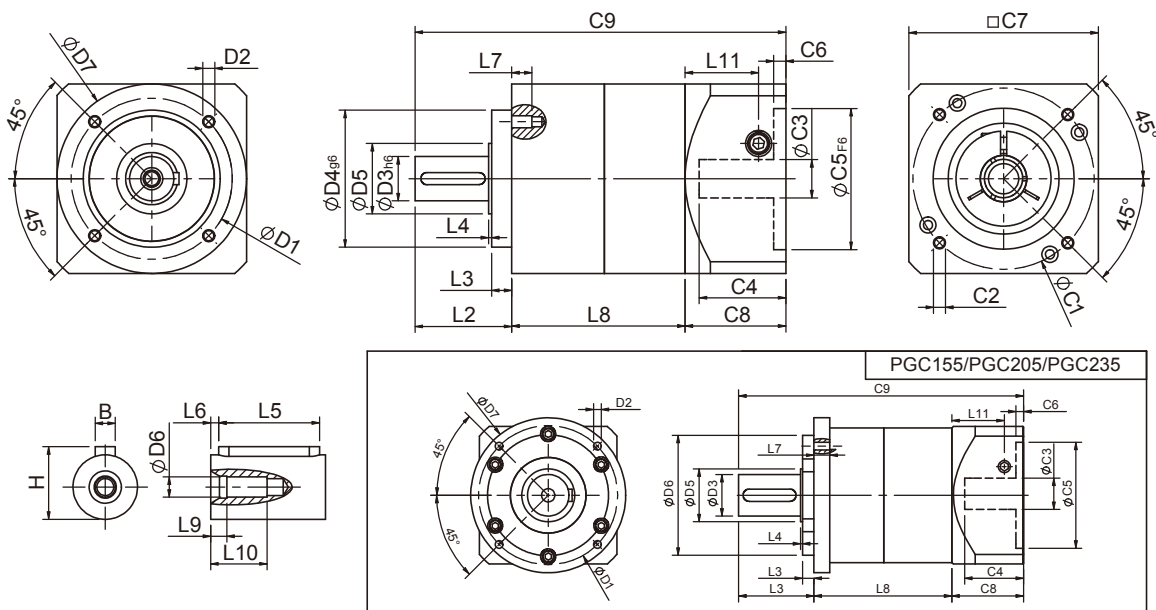
Unit:mm

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 _{h6}	13	16	22	32	40	55	75
D4 _{g6}	35	52	68	90	120	160	180
D5	15	25	35	45	50	70	90
D6	M4x0.7P	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	50	70	94	120	155	205	235
L2	24.5	35	48	60	93	99.5	126
L3	4	5	10	6	8	15	18
L4	1.5	1.5	1.5	3	6	2.5	3
L5	15	25	32	40	60	70	90
L6	2	2	3	5	5	6	7
L7	8	10	10	15	18	21	32
L8	30	38	46	61	79	92.5	129.5
L9	4	4	4.5	6	6	8	7
L10	14	16.5	20.5	30	38	48	42
L11	24.4	31.5	36.5	42	63	69.5	102.2
C1 ²	46	70	90	115	145	200	235
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P	M12x1.75P
C3 ²	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50	≤55
C4 ²	27	35	43	58	66	82	98
C5 ² _{F6}	30	50	70	95	110	114.3	200
C6 ²	4	5	5	8	6	13	12
C7 ²	50	70	94	120	140	182	220
C8 ²	38.5	46	55	63	80	95	130
C9 ²	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 motor flange.

★ Specification subject to change without notice.

PGC Double Stage Dimensions-1



Specifications

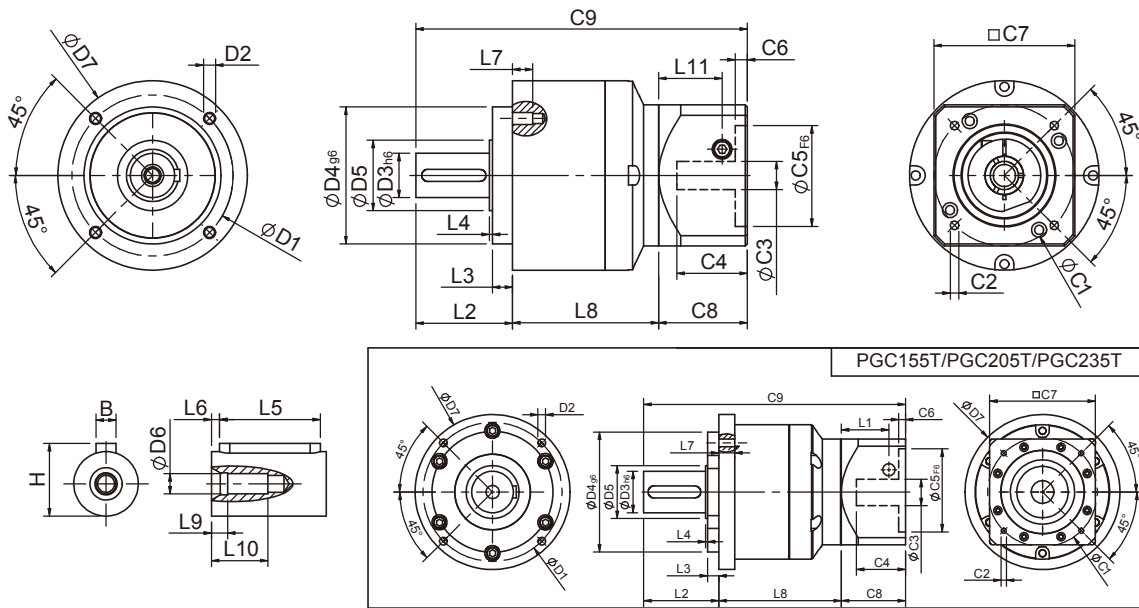
Unit:mm

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 _{h6}	12	16	22	32	40	55	75
D4 _{g6}	35	52	68	90	120	160	180
D5	15	25	35	45	50	70	90
D6	M4x0.7P	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	50	70	94	120	155	205	235
L2	24.5	35	48	60	93	99.5	126
L3	4	5	10	6	8	15	18
L4	1.5	1.5	1.5	3	6	2.5	3
L5	15	25	32	40	60	70	90
L6	2	2	3	5	5	6	7
L7	8	10	10	15	18	21	32
L8	56	66	86	109	140	182.5	244
L9	4	4	4.5	6	6	8	7
L10	14	16.5	20.5	30	38	48	42
L11	24.4	31.5	36.5	42	63	69.5	102.2
C1 ²	46	70	90	115	145	200	235
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P	M12x1.75P
C3 ²	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50	≤55
C4 ²	27	35	43	58	66	82	98
C5 ² _{F6}	30	50	70	95	110	114.3	200
C6 ²	4	5	5	8	6	13	12
C7 ²	50	70	94	120	140	182	220
C8 ²	34	44	50	63	80	95	130
C9 ²	114.5	145	184	232	313	377	500
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 motor flange.

★ 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 _{h6}	16	22	32	40	55	75
D4 _{g6}	52	68	90	120	160	180
D5	25	35	45	50	70	90
D6	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	70	94	120	155	205	235
L2	35	48	60	93	99.5	126
L3	5	10	6	8	15	18
L4	1.5	1.5	3	6	2.5	3
L5	25	32	40	60	70	90
L6	2	3	5	5	6	7
L7	10	10	15	18	21	32
L8	60.8	72.5	99.4	127	162	211.5
L9	4	4.5	6	6	8	7
L10	16.5	20.5	30	38	48	42
L11	29	35.5	40.5	42	63	69.5
C1 ²	46	70	90	115	145	200
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 ²	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50
C4 ²	28.5	41	47.75	58	66	82
C5 ² _{F6}	30	50	70	95	110	114.3
C6 ²	5.5	8	6	8	6	13
C7 ²	50	70	94	120	140	182
C8 ²	40	50	55	63	80	95
C9 ²	135.8	170.5	214.4	283	341.5	432.5
B	5	6	10	12	16	20
H	18	24.5	35	a43	59	79.5

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

★ Specification subject to change without notice.

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	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 ²	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 ²		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)

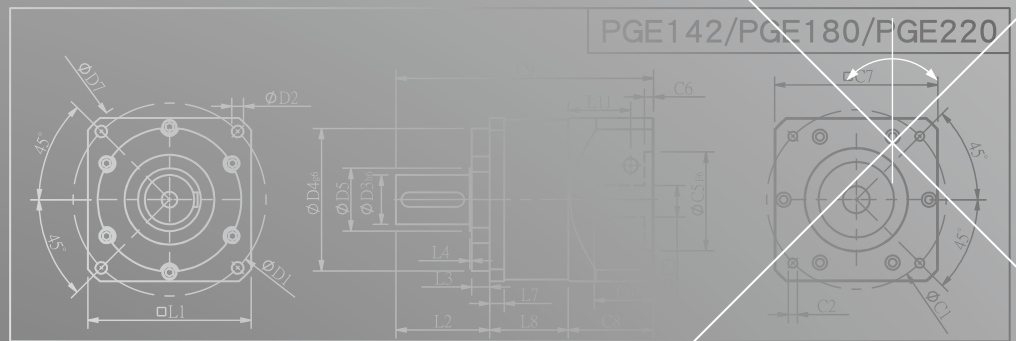
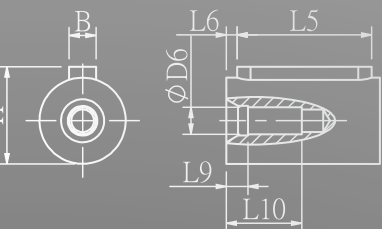
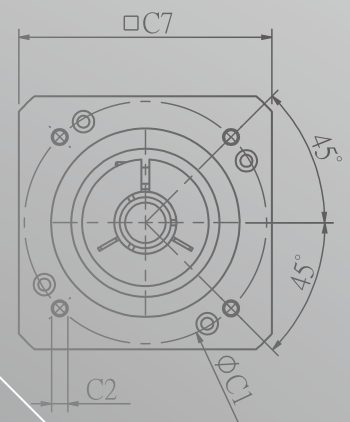
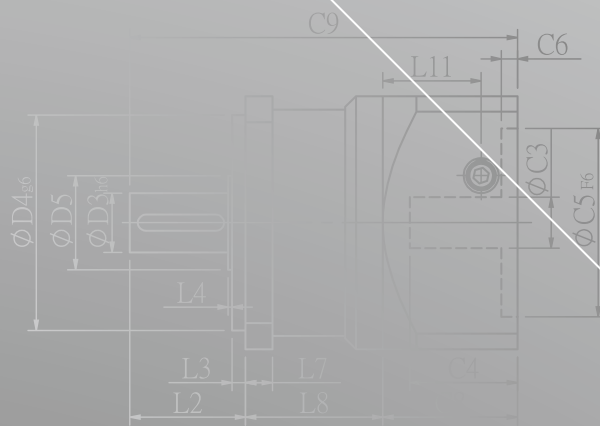
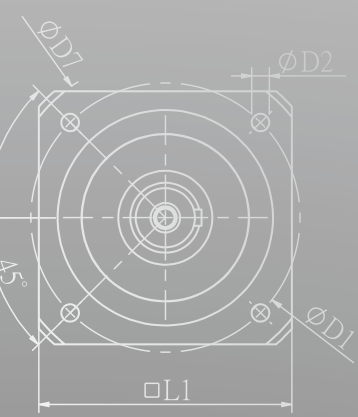
* 1. Applied to the output shaft center at 100 rpm.

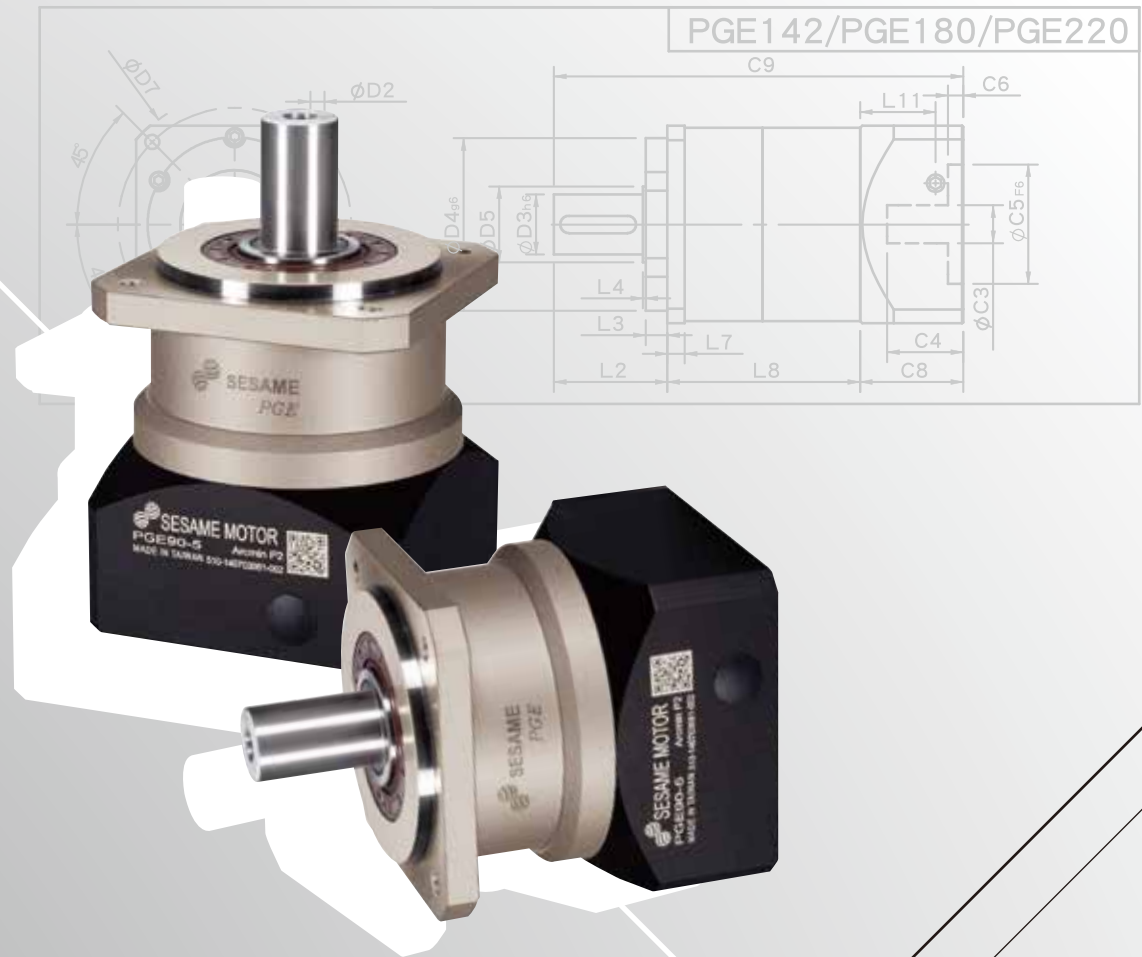
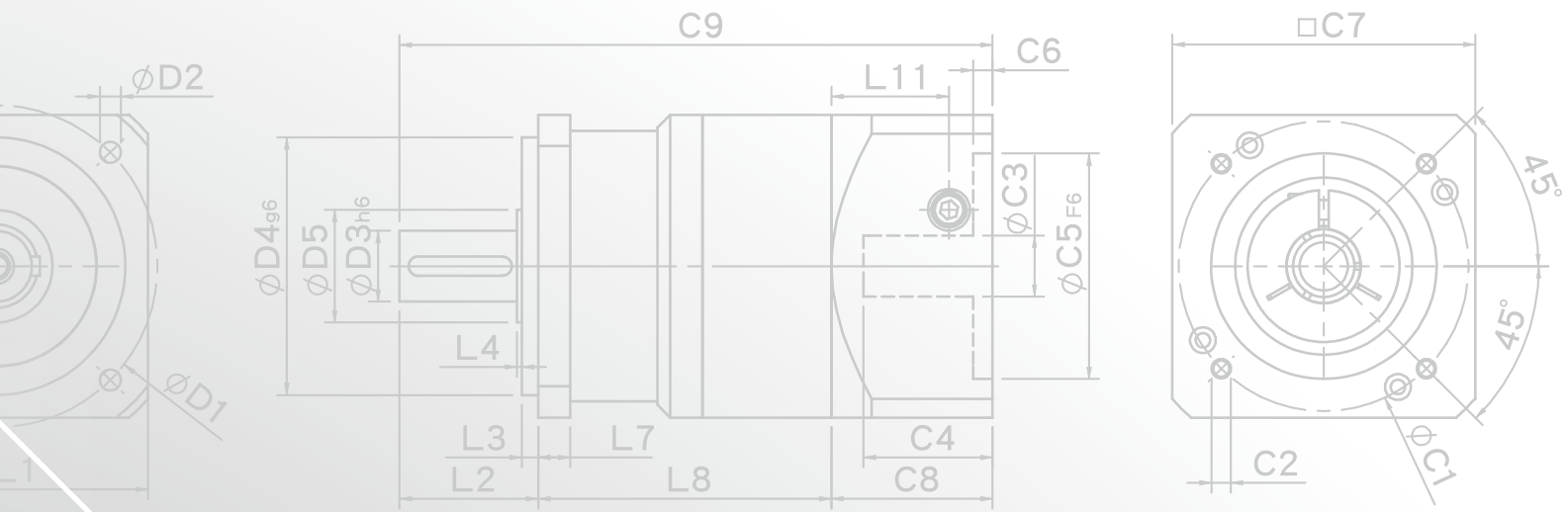
* 2. Measured at 3000 rpm with no load. These values are measured by gearbox with ratio = 10 (1-stage) or ratio = 100 (2-stage) at nominal input speed or 3000 rpm (if nominal input speed is higher than 3000 rpm) with no load.

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

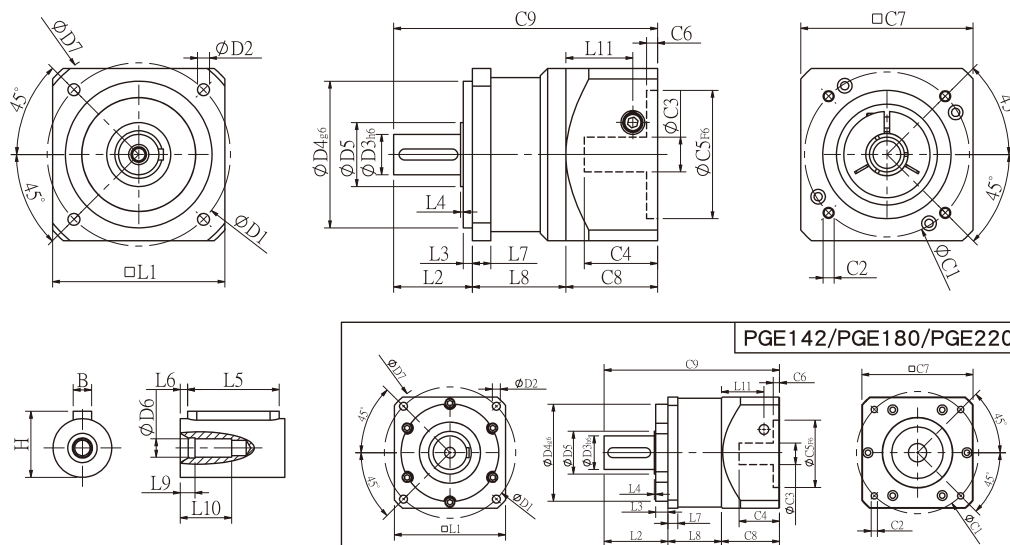
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PGE SERIES





PGE Single Stage Dimensions



Specifications

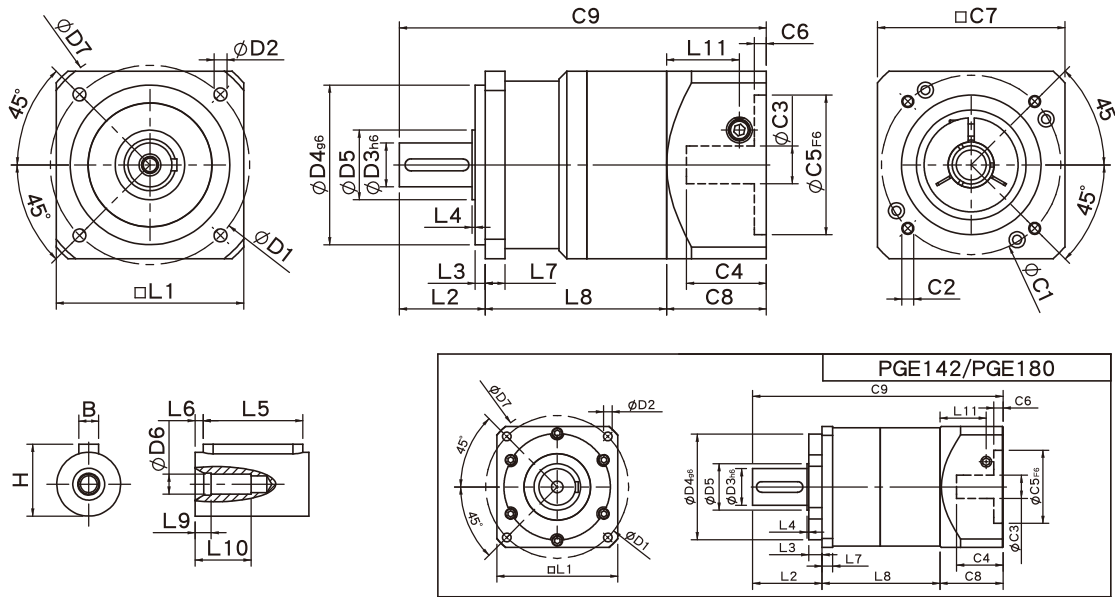
Unit:mm

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 _{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	64	90	120	152	186	239	292
L1	50	70	94	120	142	182	220
L2	24.5	37	43	60	93	104.5	138
L3	4	7	5	6	8	20	30
L4	1.5	1.5	1.5	3	6	2.5	3
L5	15	25	32	40	60	70	90
L6	2	2	3	5	5	6	7
L7	5	6	10	12	18	16	20
L8	30	36	51	61	79	87.5	117.5
L9	4	4	4.5	6	6	8	7
L10	14	16.5	20.5	30	38	48	42
L11	24.4	31.5	36.5	42	63	69.5	102.2
C1 ²	46	70	90	115	145	200	235
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P	M12x1.75P
C3 ²	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50	≤55
C4 ²	27	35	43	58	66	82	98
C5 ² _{F6}	30	50	70	95	110	114.3	200
C6 ²	4	5	5	8	6	13	12
C7 ²	50	70	94	120	140	182	220
C8 ²	38.5	46	55	63	80	95	130
C9 ²	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 motor flange.

★ Specification subject to change without notice.

PGE Double Stage Dimensions-1



Specifications

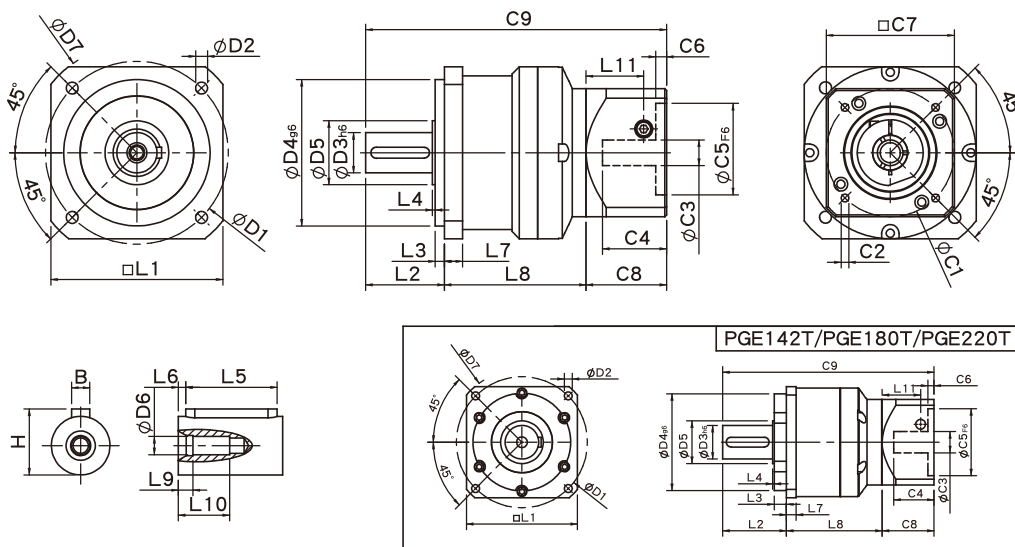
Unit:mm

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 _{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	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 ²	46	70	90	115	145	200
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 ²	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50
C4 ²	27	35	43	58	66	82
C5 ² _{F6}	30	50	70	95	110	114.3
C6 ²	4	5	5	8	6	13
C7 ²	50	70	94	120	140	182
C8 ²	38.5	46	55	63	80	95
C9 ²	119	147	189	232	313	377
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.

PGE Double Stage Dimensions-2



Specifications

Unit:mm

Dimensions	PGE70T	PGE90T	PGE120T	PGE142T	PGE180T	PGE220T
D1	70	100	130	165	215	250
D2	6	6.5	8.5	10.5	13	17
D3 _{h6}	16	22	32	40	55	75
D4 _{g6}	50	80	110	130	160	180
D5	25	35	45	50	70	90
D6	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20x2.5P
D7	90	120	152	186	239	292
L1	70	94	120	142	182	220
L2	37	43	60	93	104.5	138
L3	7	5	6	8	20	30
L4	1.5	1.5	3	6	2.5	3
L5	25	32	40	60	70	90
L6	2	3	5	5	6	7
L7	6	10	12	18	16	20
L8	58.8	77.5	99.4	127	157	199.5
L9	4	4.5	6	6	8	7
L10	16.5	20.5	30	38	48	42
L11	29	35.5	40.5	42	63	69.5
C1 ²	66.67	70	90	115	145	200
C2 ²	M5x0.8P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 ²	≤8	≤14	≤19/≤24	≤24/≤28	≤35	≤50
C4 ²	27	41	47.75	58	66	82
C5 ² _{F6}	38.1	50	70	95	110	114.3
C6 ²	4	8	6	8	6	13
C7 ²	60	70	94	120	140	182
C8 ²	38.5	50	55	63	80	95
C9 ²	134.3	170.5	214.4	283	341.5	432.5
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 motor flange.

★ 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 P_0	arcmin	1	3-10	-	-	-	≤ 3	≤ 3	≤ 3	≤ 3
		2	15-100	-	-	-	≤ 5	≤ 5	≤ 5	≤ 5
Precision Backlash P_1	arcmin	1	3-10	-	≤ 6	≤ 6	≤ 5	≤ 5	≤ 5	≤ 5
		2	15-100	-	≤ 9	≤ 9	≤ 7	≤ 7	≤ 7	≤ 7
Standard Backlash P_2	arcmin	1	3-10	≤ 12	≤ 9	≤ 9	≤ 7	≤ 7	≤ 7	≤ 7
		2	15-100	≤ 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	15-100	≥ 92%						
Weight	kg	1	3-10	0.7	1.4	3.0	7.3	15.6	26	56
		2	15-100	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 ²	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 ²		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)

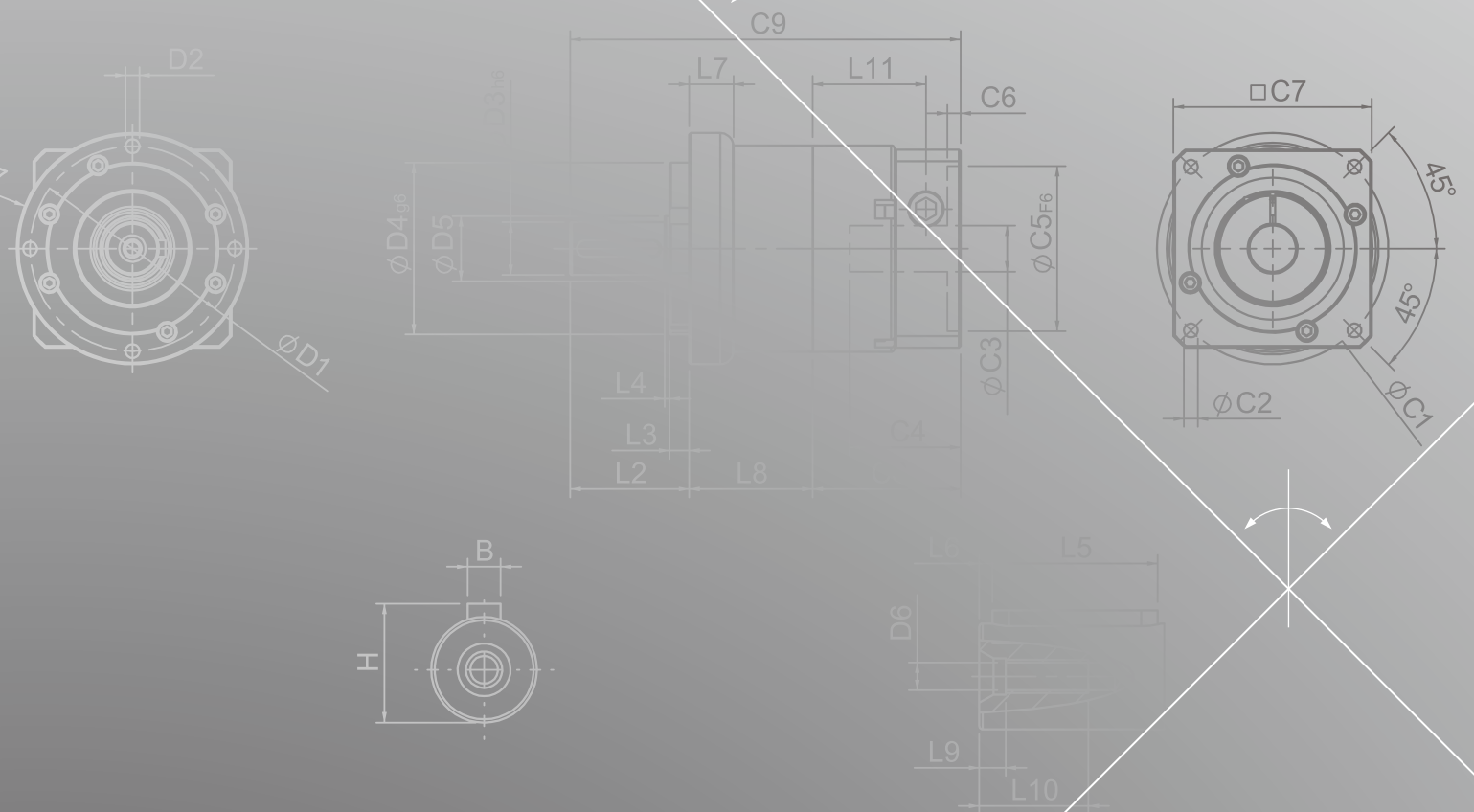
* 1. Applied to the output shaft center at 100 rpm.

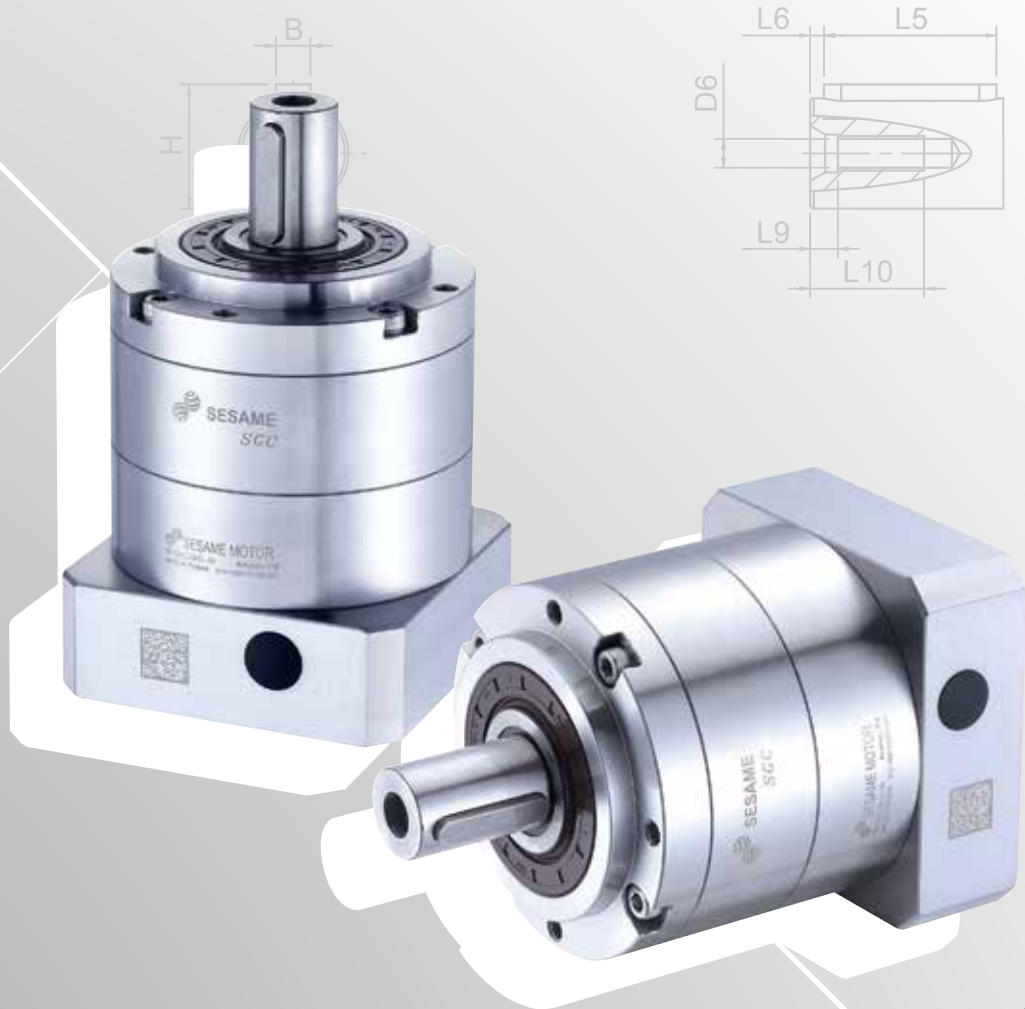
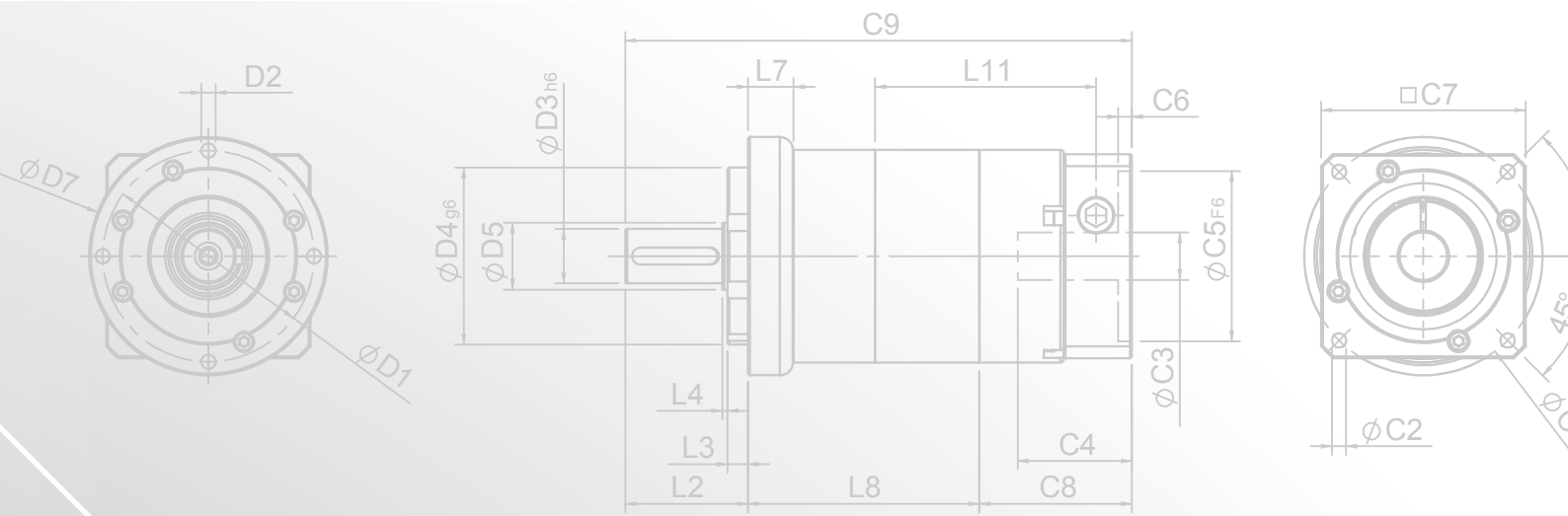
* 2. Measured at 3000 rpm with no load. These values are measured by gearbox with ratio = 10 (1-stage) or ratio = 100 (2-stage) at nominal input speed or 3000 rpm (if nominal input speed is higher than 3000 rpm) with no load.

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

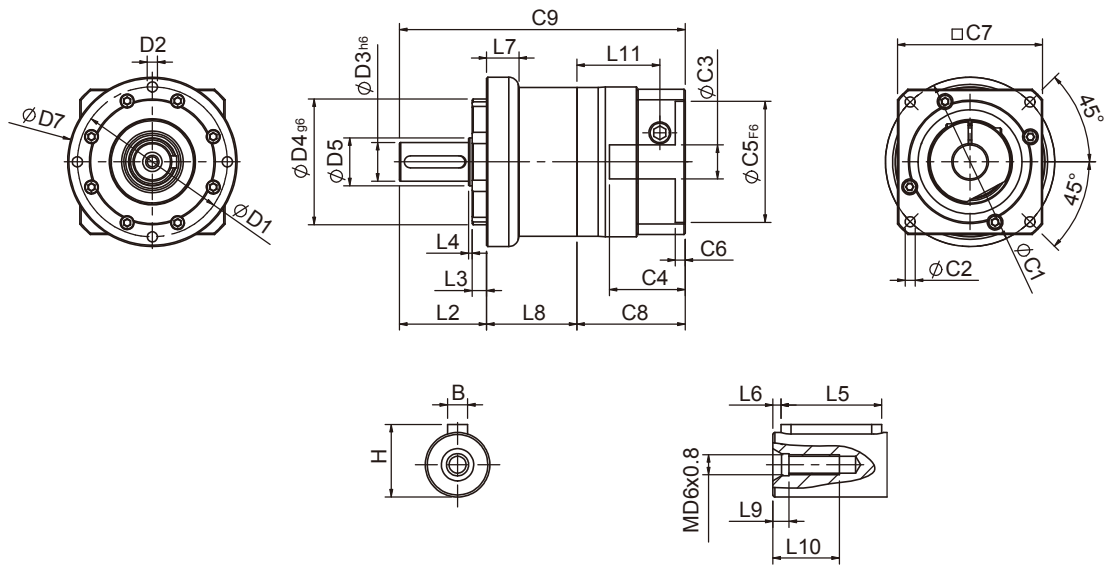
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SGC SERIES





SGC Single Stage Dimensions



Specifications

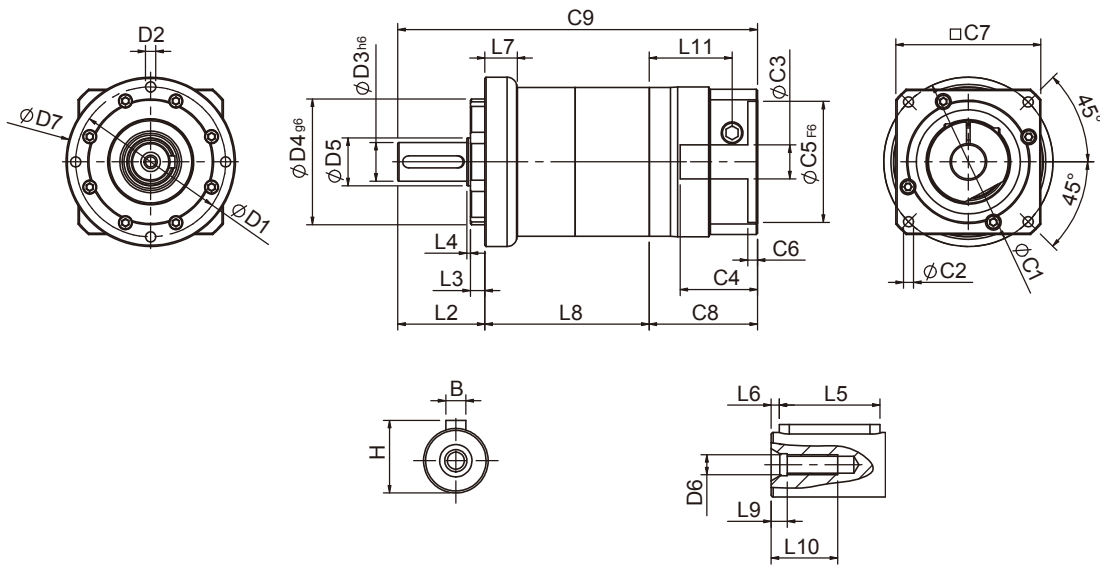
Unit:mm

Dimensions	SGC50	SGC70	SGC90
D1	-	62	80
D2	-	M5x0.8P	M6x1.0P
D3 _{h6}	-	16	22
D4 _{g6}	-	52	68
D5	-	20	35
D6	-	M5x0.8P	M8x1.25P
D7	-	70	90
L2	-	36	46
L3	-	6	7
L4	-	1.5	2.5
L5	-	25	32
L6	-	2	3
L7	-	13.4	14.1
L8	-	37.3	43.8
L9	-	4	4.5
L10	-	16.5	20.5
L11	-	34.3	41.5
C1 ²	-	70	90
C2 ²	-	M5x0.8P	M6x1.0P
C3 ²	-	$\leq 14 / \leq 19$	$\leq 19 / \leq 24 / \leq 28$
C4 ²	-	33.5	41
C5 ² _{F6}	-	50	70
C6 ²	-	4	6
C7 ²	-	60	90
C8 ²	-	44.8	55.8
C9 ²	-	118.1	145.6
B	-	5	6
H	-	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.

SGC Double Stage Dimensions



Specifications

Unit:mm

Dimensions	SGC50	SGC70	SGC90
D1	-	62	80
D2	-	M5x0.8P	M6x1.0P
D3 _{h6}	-	16	22
D4 _{g6}	-	52	68
D5	-	20	35
D6	-	M5x0.8P	M8x1.25P
D7	-	70	90
L2	-	36	46
L3	-	6	7
L4	-	1.5	2.5
L5	-	25	32
L6	-	2	3
L7	-	13.4	14.1
L8	-	67.9	84.7
L9	-	4	4.5
L10	-	16.5	20.5
L11	-	34.3	41.5
C1 ²	-	70	90
C2 ²	-	M5x0.8P	M6x1.0P
C3 ²	-	≤14/≤19	≤19/≤24/≤28
C4 ²	-	33.5	41
C5 ² _{F6}	-	50	70
C6 ²	-	4	6
C7 ²	-	60	90
C8 ²	-	44.8	55.8
C9 ²	-	148.7	186.5
B	-	5	6
H	-	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.

SGC Specifications Table

Specifications		Stage	Ratio	SGC-50	SGC-70	SGC-90	SGC-120	
Nominal Output Torque T_{2N}	N · m	1	3	9	28	85	220	
			4	10	32	80	240	
			5	11	35	95	270	
			7	10	28	85	220	
			9	8	23	75	210	
			10	8	21	65	190	
		2	Stage	Ratio	SGC-50	SGC-70(T)	SGC-90(T)	SGC-120T
			15	11	34	90	250	
			20	10	32	80	240	
			25	11	35	95	270	
			35	11	35	95	270	
			45	11	35	95	270	
			49	10	28	85	220	
			63	10	28	85	220	
81	8	23	75	210				
100	8	21	65	190				
Emergency 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	6000	6000	6000	5000	
Standard Backlash P_2	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	4.0	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	1,2	3-100	-10°C ~ +90 °C				
Service Life	hr	1,2	3-100	20,000 (10,000 Continuous operation)				
Efficiency	%	1	3-10	≥ 95%				
		2	15-100	≥ 90%				
Weight	kg	1	3-10	0.9	1.9	4.8	11.5	
		2	15-100	1.1	2.4(2.2)	6.5(5.4)	13.5	
Mounting Position	-	1,2	3-100	Any Direction				
Noise Level ²	dB(A)/1m	1,2	3-100	61	63	66	67	
Protection Class	-	1,2	3-100	IP65 (Optional : IP67)				
Lubrication	-	1,2	3-100	Synthetic Lubricant (Optional: Food Grade Grease)				
Inertia (J1)								
Stage	Ratio	unit	SGC-50(ψ_8)	SGC-70(ψ_{14})	SGC-90(ψ_{19})	SGC-120(ψ_{24})		
1	3	Kg · cm ²	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		SGC-50(ψ_8)	SGC-70(ψ_{14})/ SGC-70T(ψ_8)	SGC-90(ψ_{19})/ SGC-90T(ψ_{14})	SGC-120T(ψ_{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		
	45/63/81/100		0.03	0.21(0.03)	0.60(0.21)	0.60		

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

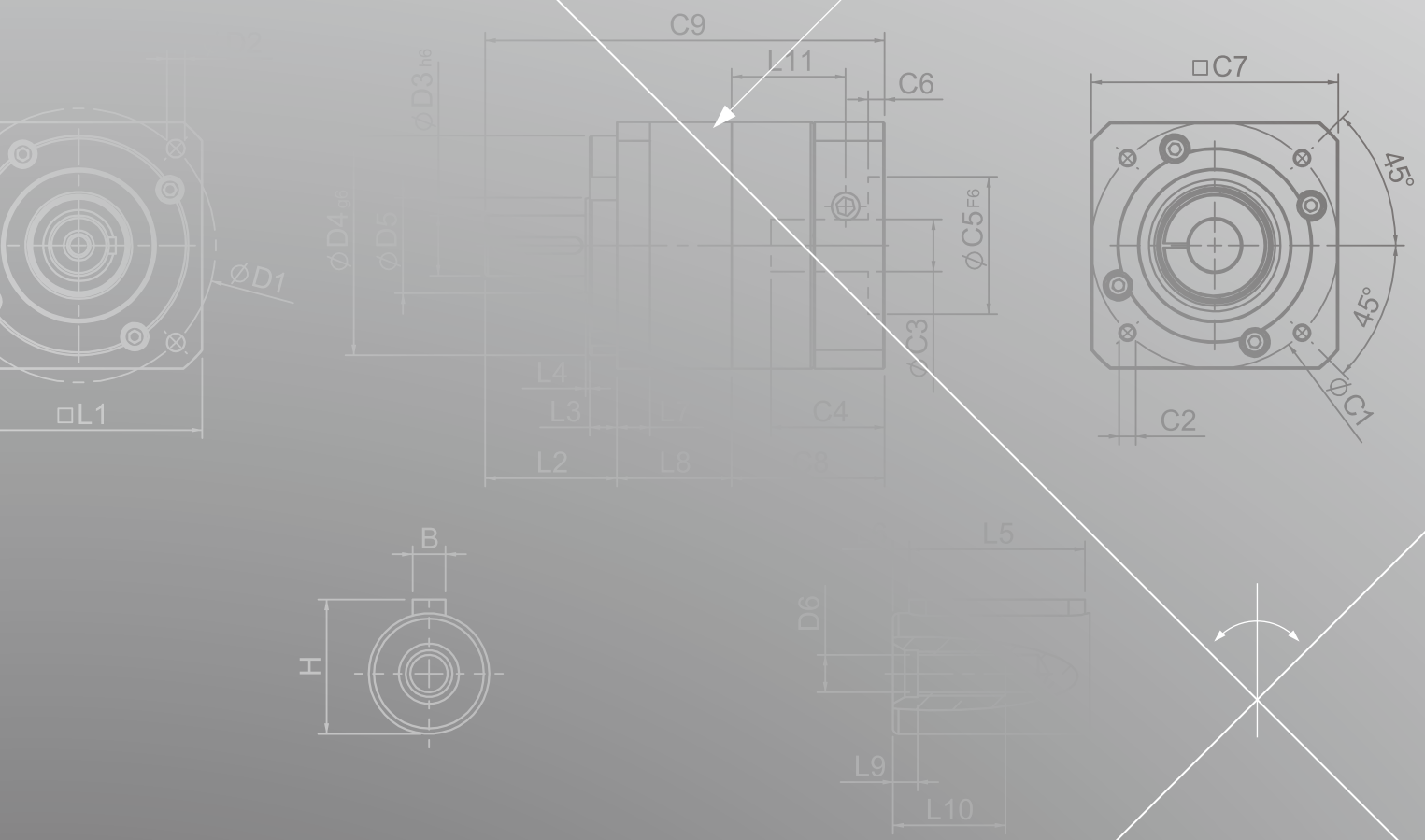
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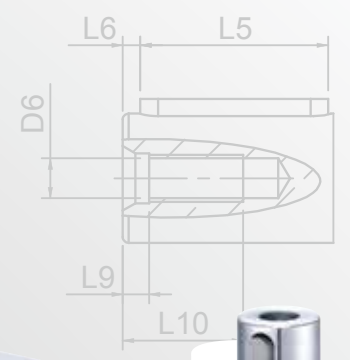
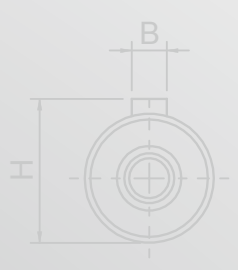
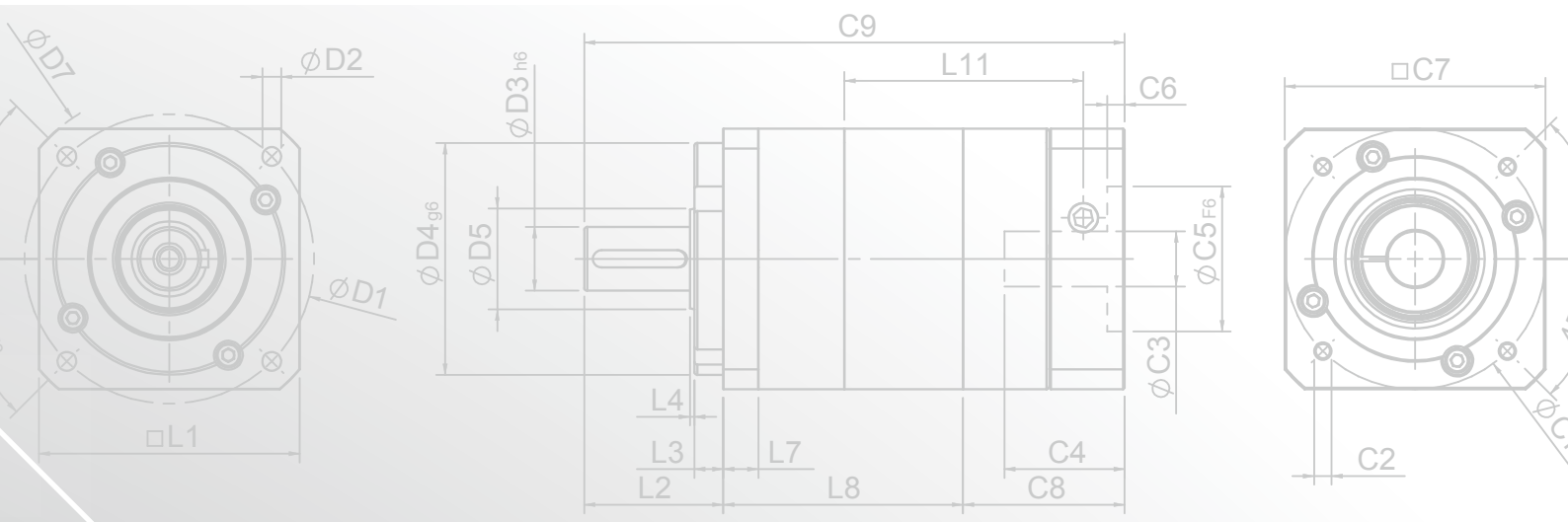
PLANETARY GEARHEADS



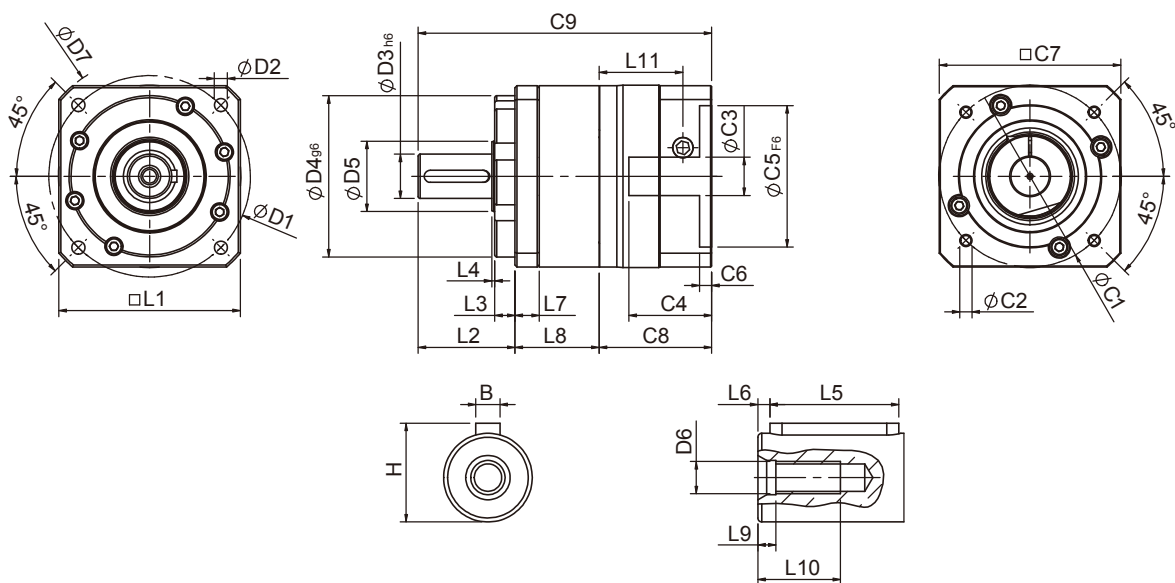
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SGE SERIES





SGE Single Stage Dimensions



Specifications

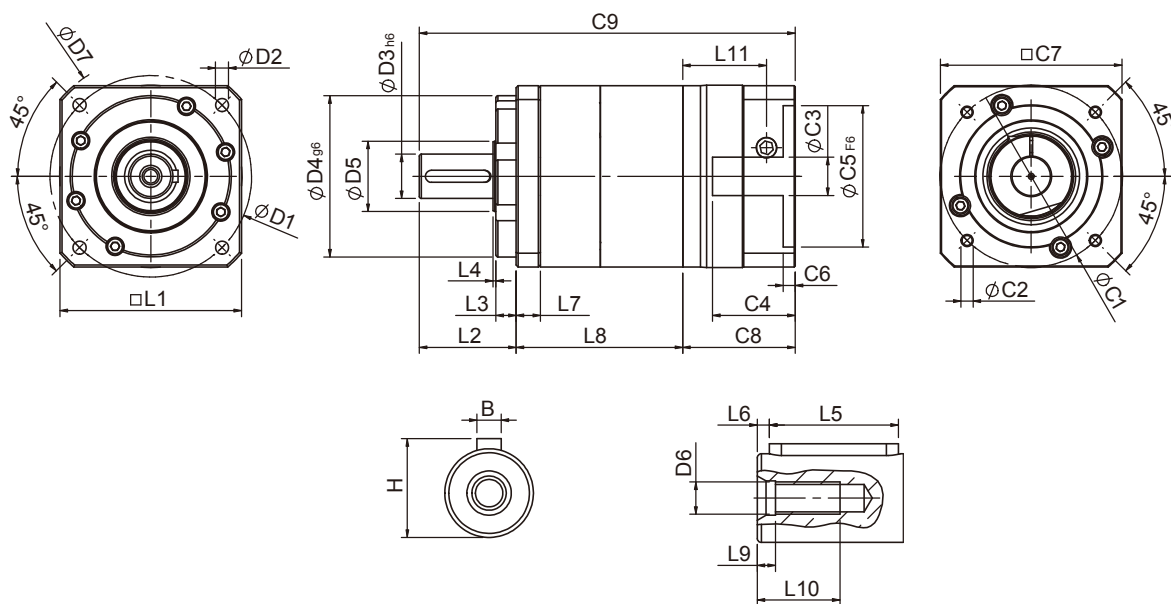
Unit:mm

Dimensions	SGE42	SGE60	SGE90
D1	-	70	100
D2	-	5.5	6.5
D3 _{h6}	-	16	22
D4 _{g6}	-	50	80
D5	-	20	35
D6	-	M5x0.8P	M8x1.25P
D7	-	80	118
L1	-	62.5	90
L2	-	37	48
L3	-	7	10
L4	-	1.5	1.5
L5	-	25	32
L6	-	2	3
L7	-	10	12.1
L8	-	36.3	41.8
L9	-	4	4.5
L10	-	16.5	20.5
L11	-	34.3	41.5
C1 ²	-	70	90
C2 ²	-	M5x0.8P	M6x1.0P
C3 ²	-	≤14/≤19	≤19/≤24/≤28
C4 ²	-	33.5	41
C5 ² _{F6}	-	50	70
C6 ²	-	4	6
C7 ²	-	60	90
C8 ²	-	44.8	55.8
C9 ²	-	118.1	145.6
B	-	5	6
H	-	18	24.5

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

★ Specification subject to change without notice.

SGE Double Stage Dimensions



Specifications

Unit:mm

Dimensions	SGE42	SGE60	SGE90
D1	-	70	100
D2	-	5.5	6.5
D3 _{h6}	-	16	22
D4 _{g6}	-	50	80
D5	-	20	35
D6	-	M5x0.8P	M8x1.25P
D7	-	80	118
L1	-	62.5	90
L2	-	37	48
L3	-	7	10
L4	-	1.5	1.5
L5	-	25	32
L6	-	2	3
L7	-	10	12.1
L8	-	66.9	82.7
L9	-	4	4.5
L10	-	16.5	20.5
L11	-	34.3	41.5
C1 ²	-	70	90
C2 ²	-	M5x0.8P	M6x1.0P
C3 ²	-	≤14/≤19	≤19/≤24/≤28
C4 ²	-	33.5	41
C5 ² _{F6}	-	50	70
C6 ²	-	4	6
C7 ²	-	60	90
C8 ²	-	44.8	55.8
C9 ²	-	148.7	186.5
B	-	5	6
H	-	18	24.5

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

★ Specification subject to change without notice.

SGE Specifications Table

Specifications		Stage	Ratio	SGE-42	SGE-60	SGE-90	SGE-115	
Nominal Output Torque T_{2N}	N · m	1	3	9	28	85	220	
			4	10	32	80	240	
			5	11	35	95	270	
			7	10	28	85	220	
			9	8	23	75	210	
			10	8	21	65	190	
		2	Stage	Ratio	SGE-42	SGE-60(T)	SGE-90(T)	SGE-115T
			15	11	34	90	250	
			20	10	32	80	240	
			25	11	35	95	270	
			35	11	35	95	270	
			45	11	35	95	270	
			49	10	28	85	220	
			63	10	28	85	220	
81	8	23	75	210				
100	8	21	65	190				
Emergency 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	6000	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	4.0	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	1,2	3-100	-10°C ~ +90 °C				
Service Life	hr	1,2	3-100	20,000 (10,000 Continuous operation)				
Efficiency	%	1	3-10	≥ 95%				
		2	15-100	≥ 90%				
Weight	kg	1	3-10	0.9	1.9	4.8	11.5	
		2	15-100	1.1	2.4(2.2)	6.5(5.4)	13.5	
Mounting Position	-	1,2	3-100	Any Direction				
Noise Level ²	dB(A)/1m	1,2	3-100	61	63	66	67	
Protection Class	-	1,2	3-100	IP65 (Optional : IP67)				
Lubrication	-	1,2	3-100	Synthetic Lubricant (Optional: Food Grade Grease)				
Inertia (J1)								
Stage	Ratio	unit	SGE-42(ψ8)	SGE-60(ψ14)	SGE-90(ψ19)	SGE-115(ψ24)		
1	3	Kg · cm ²	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		SGE-42(ψ8)	SGE-60(ψ14)/ SGE-60T(ψ8)	SGE-90(ψ19)/ SGE-90T(ψ14)	SGE-115T(ψ19)		
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			
	45/63/81/100	0.03	0.21(0.03)	0.60(0.21)	0.60			
<p>* 1. Applied to the output shaft center at 100 rpm.</p> <p>* 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.</p> <p>※ The above figures/specifications are subject to change without prior notice.</p>								

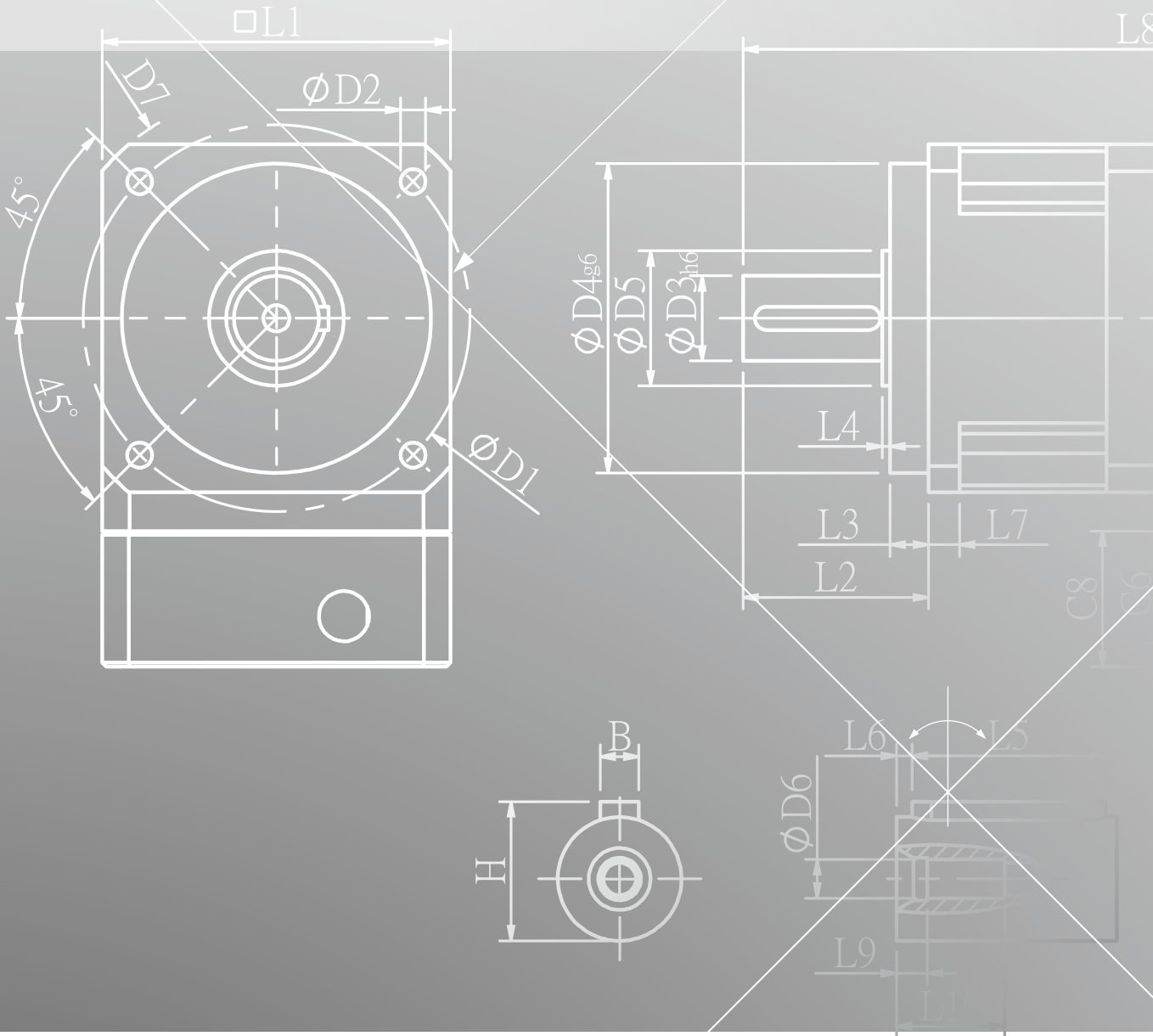
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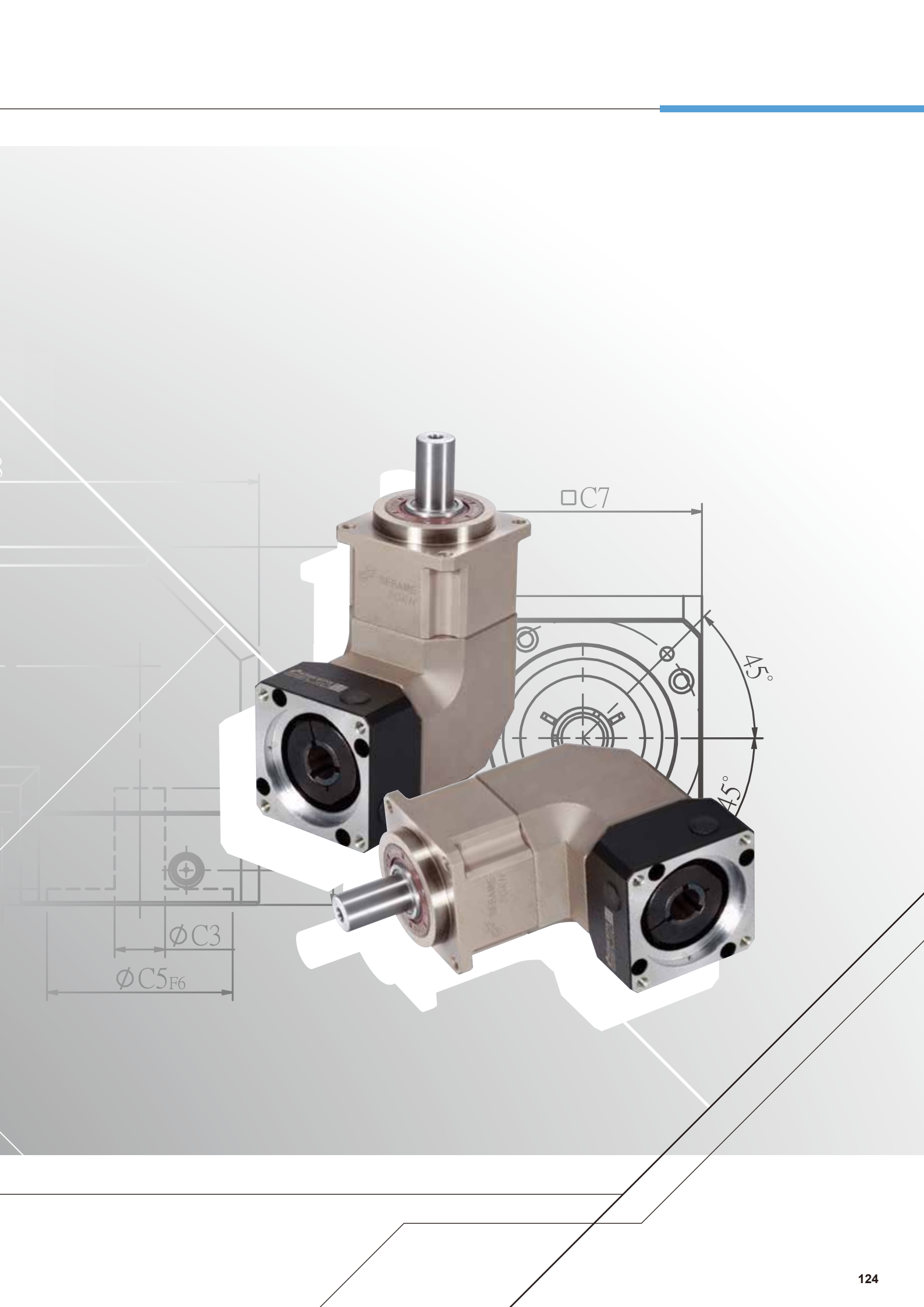
PLANETARY GEARHEADS



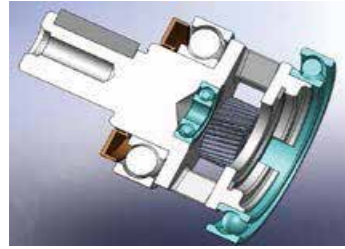
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PGRH SERIES





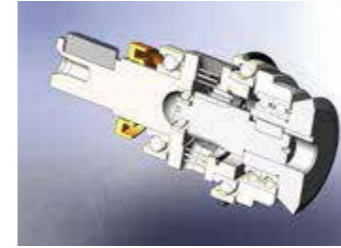
PGRH SERIES FEATURES



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.



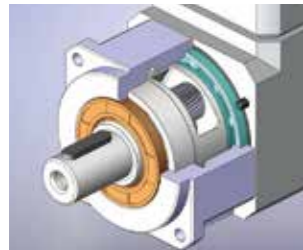
Alloy steel gear with unique heat treatment. Additionally, with gear grinding processing to get the best accuracy, high wear resistance and high impact toughness.



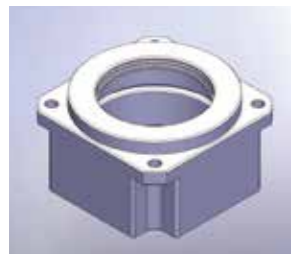
The sun gear bearing is placed directly into the planetary arm bracket, the overall mechanical structure designed to ensure concentricity of the transmission components.



Alloy steel spiral bevel gears selected after hobbing and heat treatment to ensure high accuracy of the engagement point, low backlash and low noise.

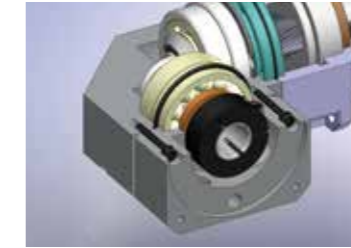
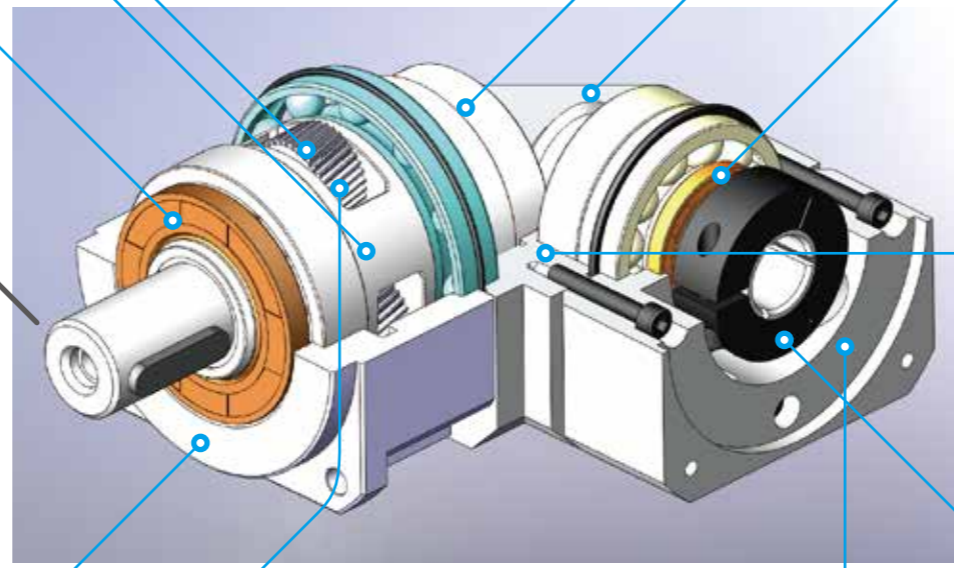


Grinding process to smooth surface of output shaft, and with oil-seal to minimum friction coefficient and reducing start up load; result in the best seal-ability and extended lifespan.

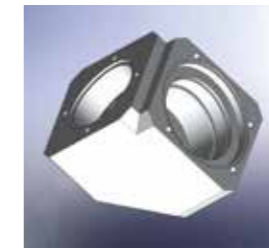


Advanced electroless nickel plating surface treatment resists scratch and corrosion. Suitable for stringent require of high-tech equipment. The gear box and internal gear ring are one-piece constructed, and then processed with advanced Germany gear shaper machinery for high-precision, high torque and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

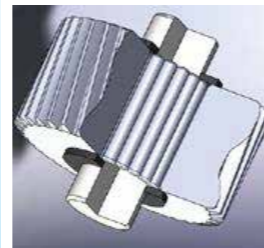
PGRH Series overall design suitable for combination operation with servo motor high-speed input and achieves maximum torque output. Right-angular designed drastically reducing the installation space. Precision gear design and gear processing create a planetary gearhead with low backlash operation, high efficiency, low noise and long lifespan.



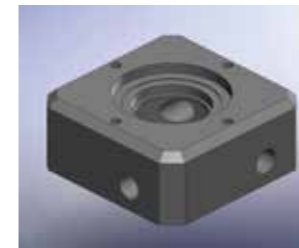
High-tech oil seal design on the upper lip guard against dust intruder, lower lip to guard against oil leak. Advanced lubricants grease and IP65 protection safeguards fully avoid leaking and given it maintenance-free.



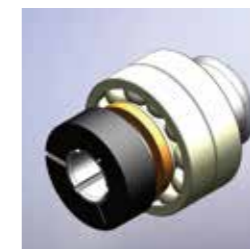
Right angular gear box processed by precision CNC equipment to obtain the highest combination with spiral bevel gears. Advanced electroless nickel plating surface treatment resists scratch and corrosion. Suitable for stringent require of high-tech equipment.



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.



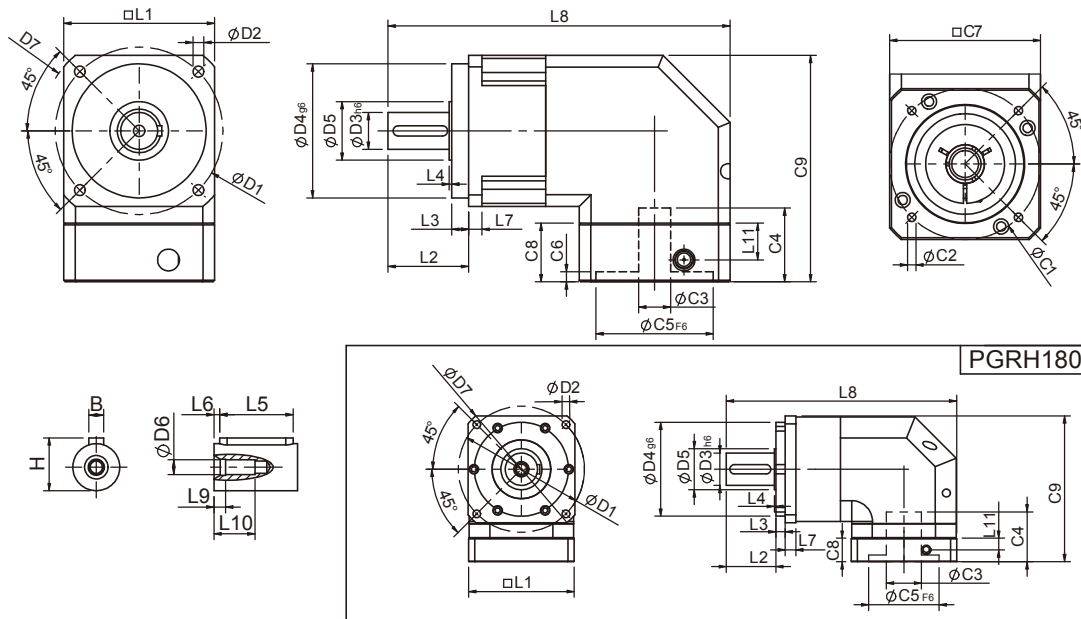
Advanced motor bracket design coupled with the input shaft bushing is easy to mount to any servo or stepper motor.



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.

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

PGRH Single Stage Dimensions



Specifications

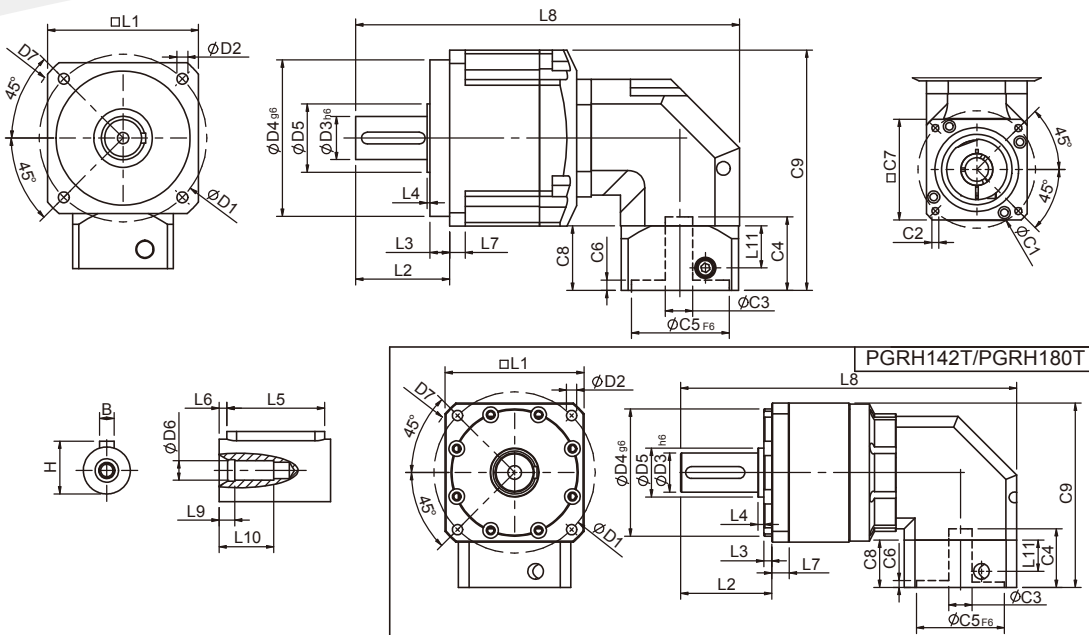
Unit:mm

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

* Specification subject to change without notice.

PGRH Double Stage Dimensions-2



Specifications

Unit:mm

Dimensions	PGRH60T	PGRH90T	PGRH115T	PGRH142T	PGRH180T	PGRH220T
D1	70	100	130	165	215	250
D2	5.5	6.5	8.5	10.5	13	17
D3h6	16	22	32	40	55	75
D4g6	50	80	110	130	160	180
D5	25	35	45	50	70	114.4
D6	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P	M20x2.5P	M20X2.5P
D7	80	118	148	186	239	292
L1	60	90	115	142	182	220
L2	37	48	63	91.5	100.5	138
L3	7	10	10	10	16	30
L4	1.5	1.5	3.5	2.5	2.5	3
L5	25	32	40	60	70	90
L6	2	3	5	5	6	7
L7	6	8	11	16	18	20
L8	151.8	200.7	272.5	345.5	424.5	537.2
L9	4	4.5	6	6	8	15
L10	16.5	20.5	30	38	48	42
L11	13.5	21.5	22	32	44.7	44
C1 ²	46	70	90	115	145	200
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 ²	≤8/≤11	≤14/≤19	≤19/≤24	≤24/≤32	≤35	≤50
C4 ²	29	34	45.2	53.5	76.8	78.8
C5 ² F6	30	50	70	95	110	114.3
C6 ²	6	5	5	6	9	6
C7 ²	42.6	60	90	115	140	180
C8 ²	25	33	35	48	65	65
C9 ²	79.5	122.8	147.5	188	207	267.5
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 motor flange.

★ Specification subject to change without notice.

PGRH Specifications Table

Specifications		Stage	Ratio	PGRH-42	PGRH-60	PGRH-90	PGRH-115	PGRH-142	PGRH-180	PGRH-220	
Nominal Output Torque T_{2N}	N • m	1	3	10	40	95	200	380	750	950	
			4	12	48	120	260	520	1000	1500	
			5	15	60	150	325	600	1200	2000	
			6	18	55	150	310	560	1100	1900	
			7	19	50	140	300	530	1100	1800	
			8	17	45	120	260	480	1000	1600	
			9	14	40	100	230	450	900	1500	
			10	15	60	150	325	600	1200	2000	
			14	14	50	140	300	530	1100	1800	
			20	14	40	100	230	450	900	1500	
		2	Stage	Ratio	PGRH-42	PGRH-60 (T)	PGRH-90(T)	PGRH-115T	PGRH-142T	PGRH-180T	PGRH-220T
			15	14	50	130	290	520	950	2000	
			20	14	50	140	300	550	1000	2000	
			25	15	60	150	325	600	1200	2000	
			30	19	55	150	310	600	1100	1900	
			35	19	50	140	300	550	1100	1800	
			40	17	45	120	260	500	1000	1600	
			45	17	40	100	230	450	900	1500	
			50	17	60	150	325	600	1200	2000	
			60	20	55	150	310	600	1100	1900	
70	20	50	140	300	530	1100	1800				
80	20	45	120	260	480	1000	1600				
90	14	40	100	230	450	900	1500				
100	14	60	150	325	600	1200	2000				
120	17	55	150	310	560	1100	1900				
140	17	50	140	300	530	1100	1800				
160	14	45	120	260	480	1000	1600				
180	12	40	100	230	450	900	1500				
200	12	40	100	230	450	900	1500				
Emergency Stop Torque T_{2NOT}	N • m		(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	3-200	5000	5000	4000	4000	3000	3000	2000	
Max. Input Speed n_{1max}	rpm	1,2	3-200	10000	10000	8000	8000	6000	6000	4000	
Micro Backlash P_0	arcmin	1	3-20	-	-	≤ 3	≤ 2	≤ 2	≤ 2	≤ 2	
		2	15-200	-	-	≤ 5	≤ 4	≤ 4	≤ 4	≤ 4	
Precision Backlash P_1	arcmin	1	3-20	≤ 5	≤ 5	≤ 5	≤ 4	≤ 4	≤ 4	≤ 4	
		2	15-200	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	
Standard Backlash P_2	arcmin	1	3-20	≤ 7	≤ 7	≤ 7	≤ 6	≤ 6	≤ 6	≤ 6	
		2	15-200	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	
Torsional Rigidity	N • m /arcmin	1,2	3-200	3	7	14	25	50	145	225	
Max. Radial Load F_{2rB}^1	N	1,2	3-200	760	1570	3250	6620	9400	14500	33000	
Max. Axial Load F_{2aB}^1	N	1,2	3-200	410	750	1870	3310	4670	6460	18530	
Operating Temp.	°C		3-200	-10 °C ~ +90 °C							
Service Life	hr		3-200	20,000 (10,000 Continuous operation)							
Efficiency	%	1	3-20	≥ 95%							
		2	15-200	≥ 92%							
Weight	kg	1	3-20	1.0	2.6	6.8	13.5	25.1	42	75	
		2	15-200	1.4	3.3/2.9	8.9/7.2	14.8	26.7	46	88	
Mounting Position	-	1,2	3-200	Any direction							
Noise Level ²	dBA/1m	1,2	3-200	61	63	65	68	70	72	74	
Protection Class	-	1,2	3-200	IP65							
Lubrication	-	1,2	3-200	Synthetic Lubricant							
Inertia (J1)											
Stage	Ratio	unit	PGRH-42	PGRH-60	PGRH-90	PGRH-115	PGRH-142	PGRH-180	PGRH-220		
1	3/4/5/7/9	Kg • cm ²	0.06	0.40	2.28	6.87	24.2	69.8	138.2		
	6/8/10/14/20		0.05	0.30	1.45	4.76	14.5	50.3	103.6		
Stage	Ratio	Kg • cm ²	PGRH-42	PGRH-60(T)	PGRH-90(T)	PGRH-115T	PGRH-142T	PGRH-180T	PGRH-220T		
2	15/20/25/35/45		0.06	0.40(0.08)	2.28(0.72)	3.02	7.83	27.7	80.3		
	others	0.05	0.30(0.06)	1.45(0.38)	1.64	5.00	15.9	55.3			

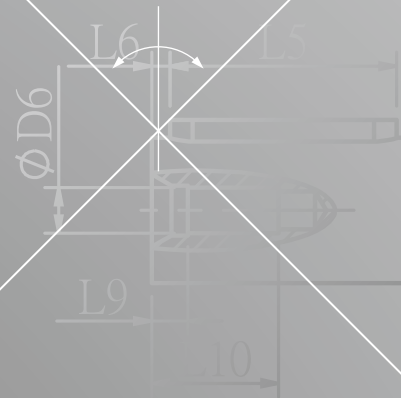
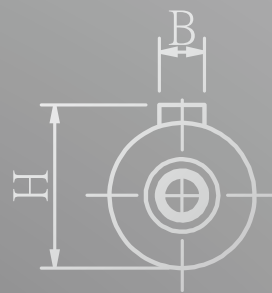
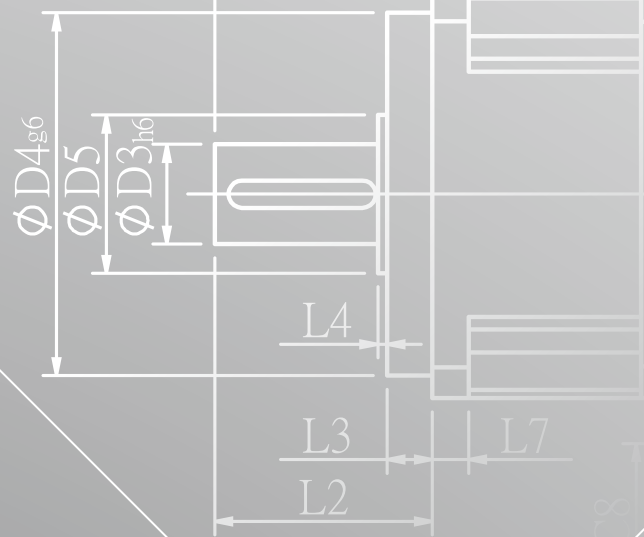
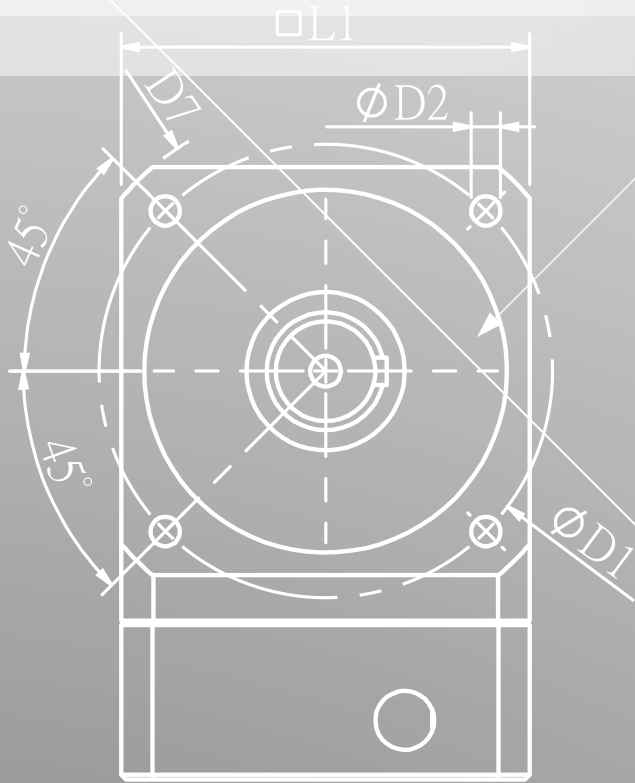
* 1. Applied to the output shaft center at 100 rpm.

* 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.

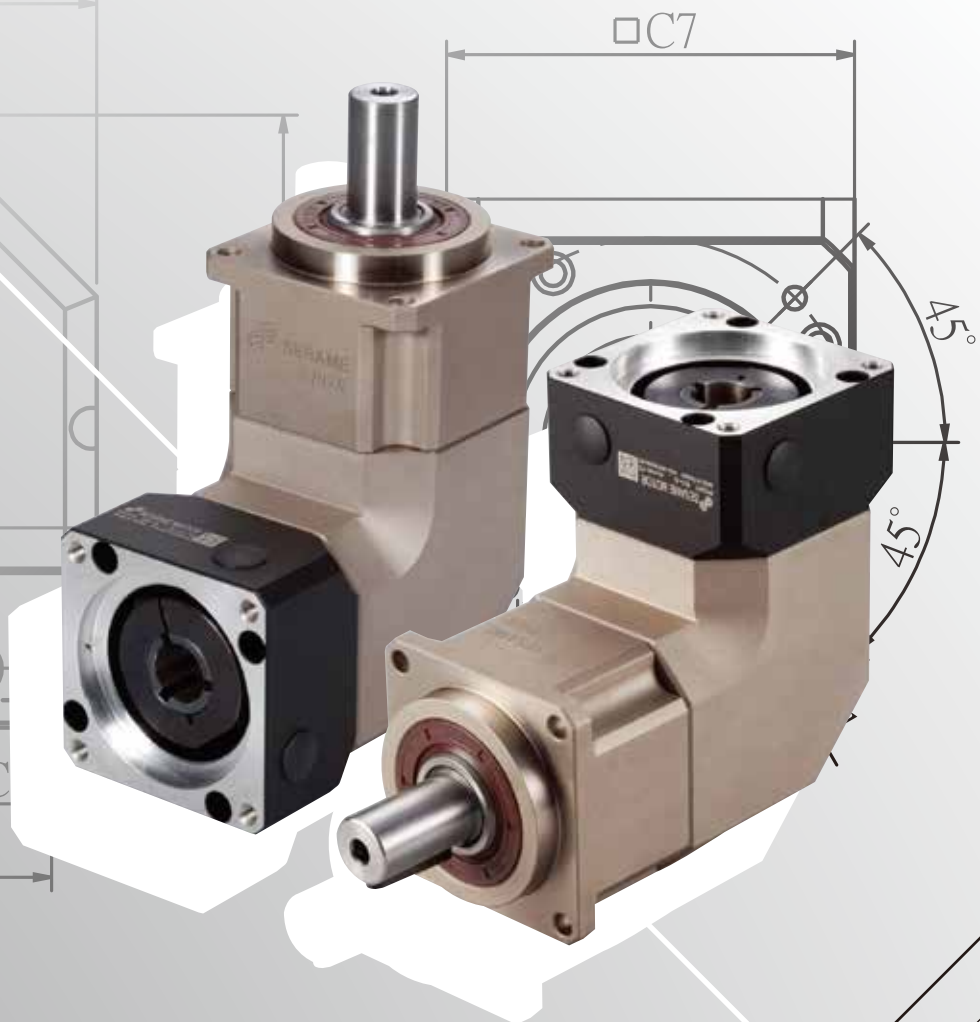
※ The above figures/specifications are subject to change without prior notice.

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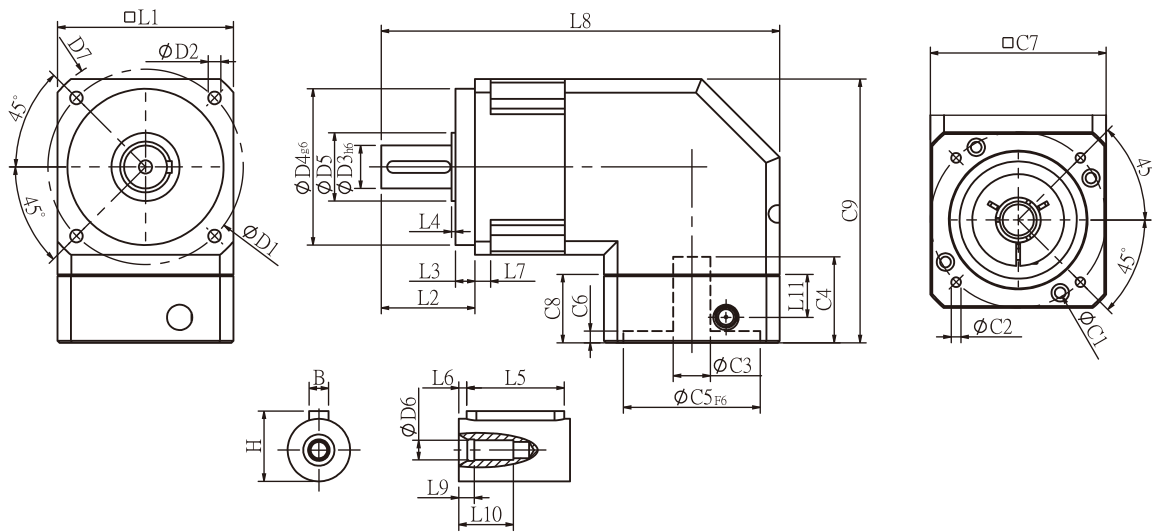
PGR SERIES



L8



PGR Single Stage Dimensions



Specifications

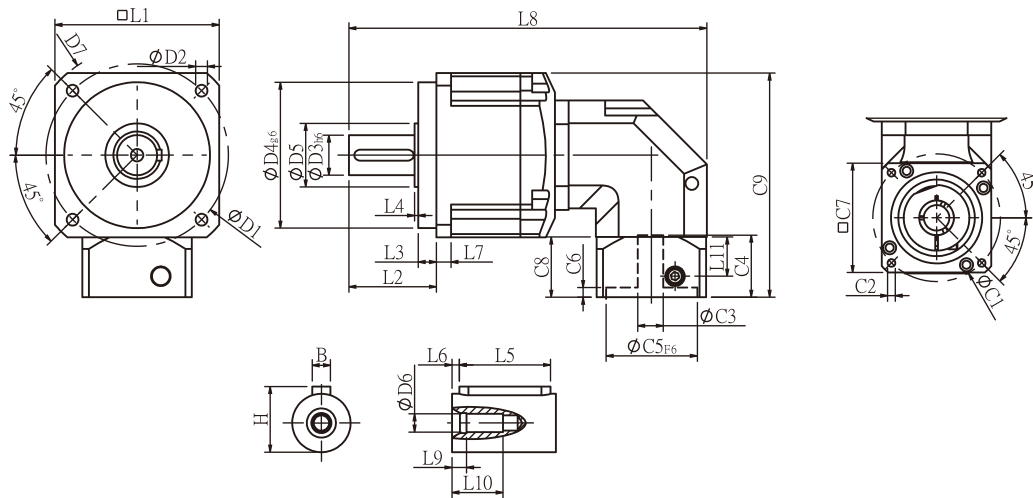
Unit:mm

Dimensions	PGR42	PGR60	PGR90	PGR115	PGR142
D1	50	70	100	130	165
D2	3.4	5.5	6.5	8.5	10.5
D3 _{h6}	13	16	22	32	40
D4 _{g6}	35	50	80	110	130
D5	15	25	35	45	50
D6	M4x0.7P	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P
D7	56	80	118	148	186
L1	42.6	60	90	115	142
L2	26	37	48	62	93
L3	5.5	7	10	8	8
L4	1.5	1.5	1.5	3	6
L5	15	25	32	40	60
L6	2	2	3	5	5
L7	4	6	8	12	18
L8	103.6	148.7	204	244.5	330
L9	4	4	4.5	6	6
L10	14	16.5	20.5	30	38
L11	13.5	21.5	22	32	44.7
C1 ²	46	70	90	115	145
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P
C3 ²	$\leq 8 / \leq 11$	$\leq 14 / \leq 19$	$\leq 19 / \leq 24$	$\leq 24 / \leq 32$	≤ 35
C4 ²	29	34	44	53	75
C5 ² _{F6}	30	50	70	95	110
C6 ²	6	5	5	6	9
C7 ²	42.6	60	90	115	140
C8 ²	25	33	35	48	65
C9 ²	70.8	107.8	135	174.5	207
B	5	5	6	10	12
H	15	18	24.5	35	43

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

★ Specification subject to change without notice.

PGR Double Stage Dimensions-2



Specifications

Unit:mm

Dimensions	PGR60T	PGR90T	PGR115T	PGR142T
D1	70	100	130	165
D2	5.5	6.5	8.5	10.5
D3 _{h6}	16	22	32	40
D4 _{g6}	50	80	110	130
D5	25	35	45	50
D6	M5x0.8P	M8x1.25P	M12x1.75P	M16x2.0P
D7	80	118	148	186
L1	60	90	115	142
L2	37	48	62	93
L3	7	10	8	8
L4	1.5	1.5	3	6
L5	25	32	40	60
L6	2	3	5	5
L7	6	8	12	18
L8	145.1	196.2	269.4	343.5
L9	4	4.5	6	6
L10	16.5	20.5	30	38
L11	13.5	21.5	22	32
C1 ²	46	70	90	115
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P
C3 ²	≤8/≤11	≤14/≤19	≤19/≤24	≤24/≤32
C4 ²	29	34	44	53
C5 ² _{F6}	30	50	70	95
C6 ²	6	5	5	6
C7 ²	42.6	60	90	115
C8 ²	25	33	35	48
C9 ²	79.5	122.8	147.5	188
B	5	6	10	12
H	18	24.5	35	43

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

★ Specification subject to change without notice.

PGR Specifications Table

Specifications		Stage	Ratio	PGR-42	PGR-60	PGR-90	PGR-115	PGR-142	
Nominal Output Torque T_{2N}	N · m	1	3	13.8	35.3	76.2	220	380	
			4	11.9	35.9	74.6	249	450	
			5	13.8	43.0	95.2	283	473	
			6	12.5	39.4	90.9	220	420	
			7	11.9	36.0	85.6	219	400	
			8	10.9	32.4	85.0	216	363	
			9	9.8	28.7	80.0	210	320	
			10	13.8	43.0	95.2	260	473	
			Stage	Ratio	PGR-42	PGR-60 / 60T	PGR-90 / 90T	PGR-115 / 115T	PGR-142 / 142T
			2	15	13.8	44.2	95.2	283	482
		20		11.9	35.9	74.6	249	490	
		25		13.8	43.0	95.2	283	473	
		30		13.8	43.0	95.2	283	473	
		35		13.8	43.0	95.2	283	473	
		40		13.8	43.0	95.2	283	473	
		45		13.8	43.0	95.2	283	473	
		50		13.8	43.0	95.2	283	473	
		60		12.5	39.4	90.9	266	436	
		70		11.9	36.0	85.6	219	400	
		80	10.9	32.4	85.0	216	363		
90	9.8	28.7	80.0	210	320				
100	10.1	25.0	75.0	210	320				
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	
Max. Input Speed n_{1max}	rpm	1,2	3-100	6000	6000	6000	5000	4000	
Micro Backlash P0	arcmin	1	3-10	-	-	-	≤ 4	≤ 4	
		2	15-100	-	-	-	≤ 6	≤ 6	
Precision Backlash P1	arcmin	1	3-10	-	-	≤ 6	≤ 6	≤ 6	
		2	15-100	-	-	≤ 9	≤ 8	≤ 8	
Standard Backlash P2	arcmin	1	3-10	≤ 12	≤ 9	≤ 9	≤ 9	≤ 9	
		2	15-100	≤ 15	≤ 12	≤ 12	≤ 11	≤ 11	
Torsional Rigidity	N · m / arcmin	1,2	3-100	1.0	2.8	7.5	15.5	30	
Max. Radial Load F_{2rB}^1	N	1,2	3-100	350	960	1630	3380	6150	
Max. Axial Load F_{2aB}^1	N	1,2	3-100	320	900	1420	2930	5510	
Operating Temp.	°C		3-100	-10°C ~ +90°C					
Service Life	hr		3-100	20,000 (10,000 Continuous operation)					
Efficiency	%	1	3-10	≥ 94%					
		2	15-100	≥ 90%					
Weight	kg	1	3-10	1.0	2.5	6.5	13.2	24.6	
		2	15-100	1.3	3.2/2.8	8.6/6.9	17.7/14.5	29.7/26.2	
Mounting Position	-	1,2	3-100	Any direction					
Noise Level ²	dB(A)/1m	1,2	3-100	65	67	70	70	75	
Protection Class	-	1,2	3-100	IP65					
Lubrication	-	1,2	3-100	Synthetic Lubricant					
Inertia (J1)									
Stage	Ratio	unit		PGR-42	PGR-60	PGR-90	PGR-115	PGR-142	
1	3/4/5/7/9	Kg · cm ²		0.06	0.40	2.28	6.87	24.2	
	6/8/10			0.05	0.30	1.45	4.76	14.5	
Stage	Ratio			PGR-42	PGR-60(T)	PGR-90(T)	PGR-115(T)	PGR-142(T)	
2	15/20/25/35/45			0.06	0.40(0.08)	2.28(0.72)	6.87(3.02)	24.2(7.83)	
	others			0.05	0.30(0.06)	1.45(0.38)	4.76(1.64)	14.5(5.00)	

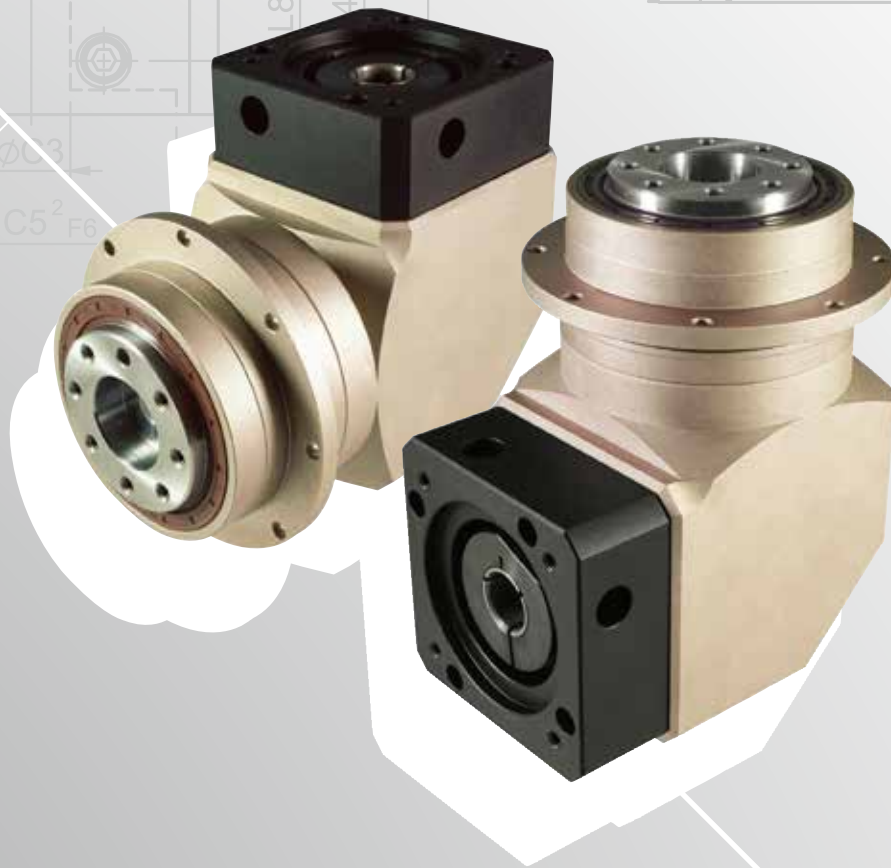
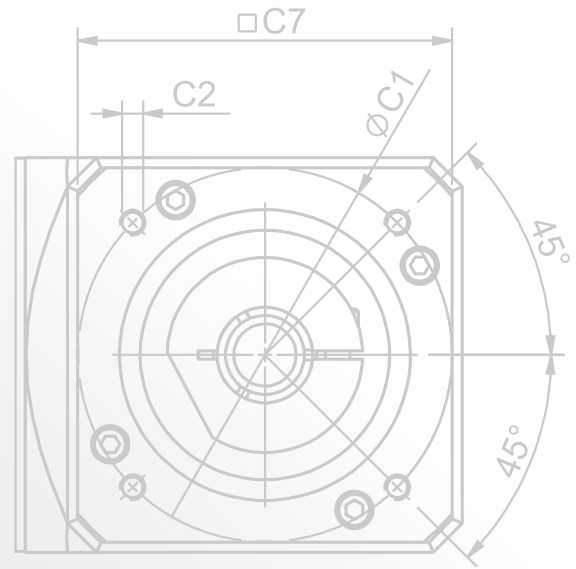
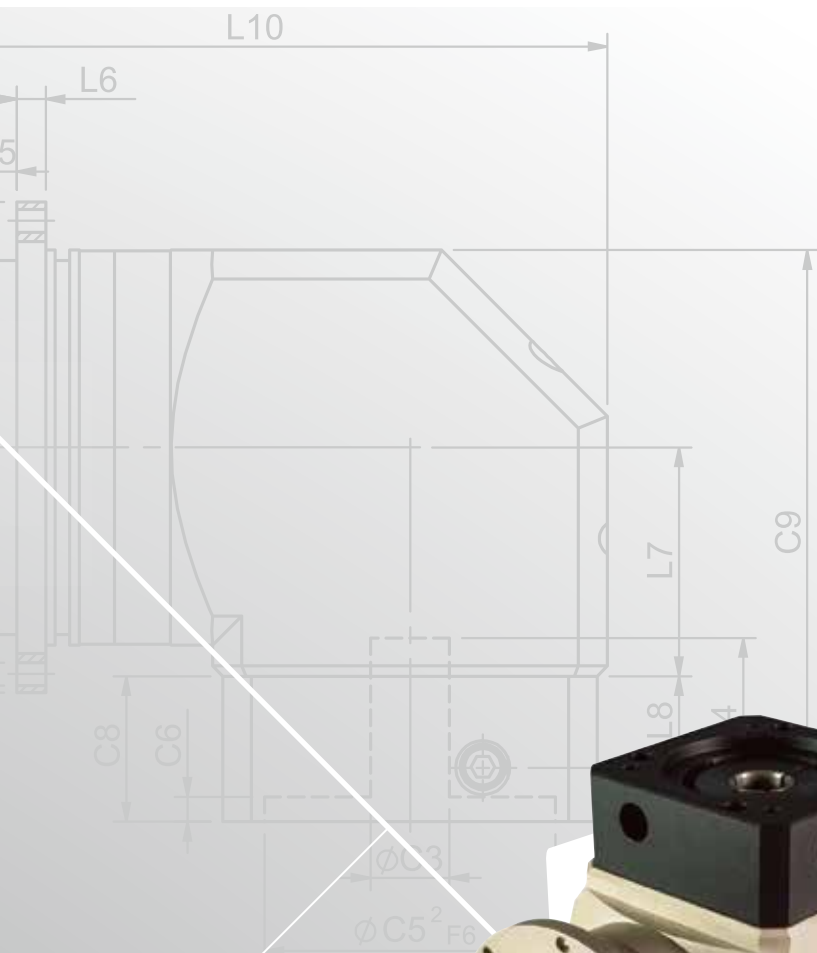
* 1. Applied to the output shaft center at 100 rpm.
* 2. Measured at 3000 rpm with no load. These values are measured by gearbox with ratio = 10 (1-stage) or ratio = 100 (2-stage) at nominal input speed or 3000 rpm (if nominal input speed is higher than 3000 rpm) with no load.
* 3. PGR115T-□□-P0 is not applicable.
※ 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.

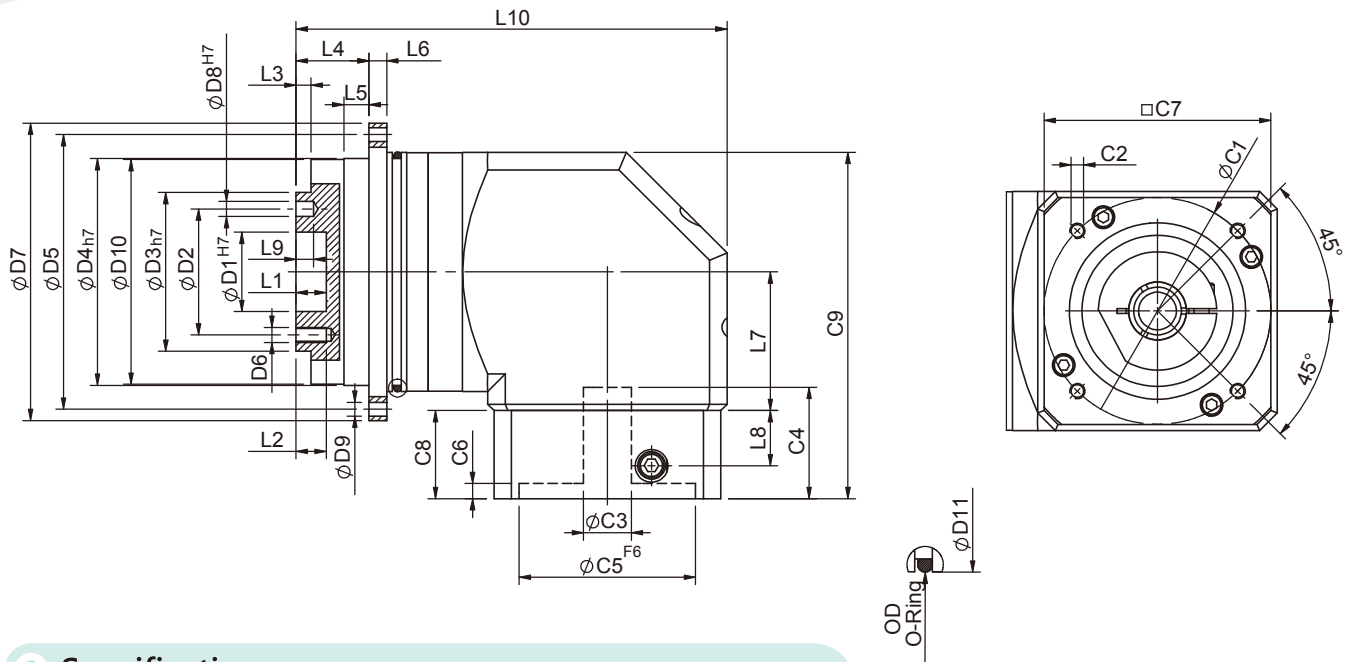
PHL PHFR PHF PGH PUR PUL PUA PGLH PGCH PGEH PGSH PGL PGC PGE SGC SGE PGRH PGR PGFR PGF PBC PBE PAE PAC PAN PGS PNS PGW

PGFR SERIES





PGFR Single Stage Dimensions



Specifications

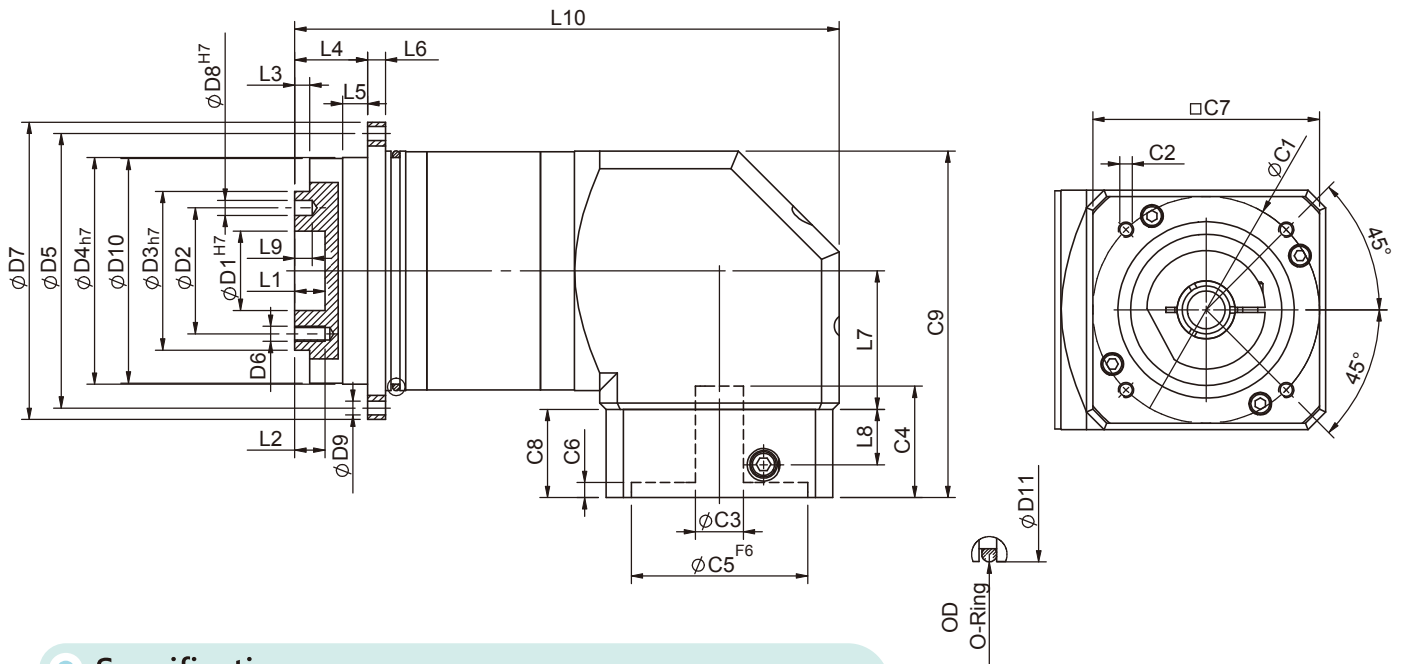
Unit:mm

Dimensions	PGFR42	PGFR60	PGFR90	PGFR115	PGFR142
D1 ^{H7}	12	20	31.5	40	50
D2	20	31.5	50	63	80
D3 _{h7}	28	40	63	80	100
D4 _{h7}	47	64	90	110	140
D5	67	79	109	135	168
D6	M3x0.5P	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P
D7	72	86	118	145	179
D8 ^{H7}	3	5	6	6	8
D9	3.4	4.5	5.5	5.5	6.6
D10	46.2	63.2	89.2	109.2	139.2
D11	60	70	95	120	152
L1	4	8	12	12	12
L2	6	7.2	12	13.5	16
L3	3	3	6	6	6
L4	19.5	19.5	29	29	38
L5	7	7	10	10	14.6
L6	4	4	7	8	10
L7	32.2	44.8	55	69	71
L8	13.5	21.5	22	32	44.7
L9	4	6	7	7	7
L10	92.2	123.9	171.1	200.2	250.7
C1 *	46	70	90	90	145
C2 *	M4x0.7P	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P
C3 *	≤8/≤11	≤14/≤19	≤19/≤24	≤24/≤32	≤35
C4 *	29	34	44	53.5	76.8
C5 ^{F6} *	30	50	70	70	110
C6 *	6	5	5	5.5	9
C7 *	42.6	60	90	115	140
C8 *	25	33	35	48	65
C9 *	78.5	112.8	137.5	176.5	225.5
OD	56x2	66x2	90x3	110x3	145x3

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

* Specification subject to change without notice.

PGFR Double Stage Dimensions-1



Specifications

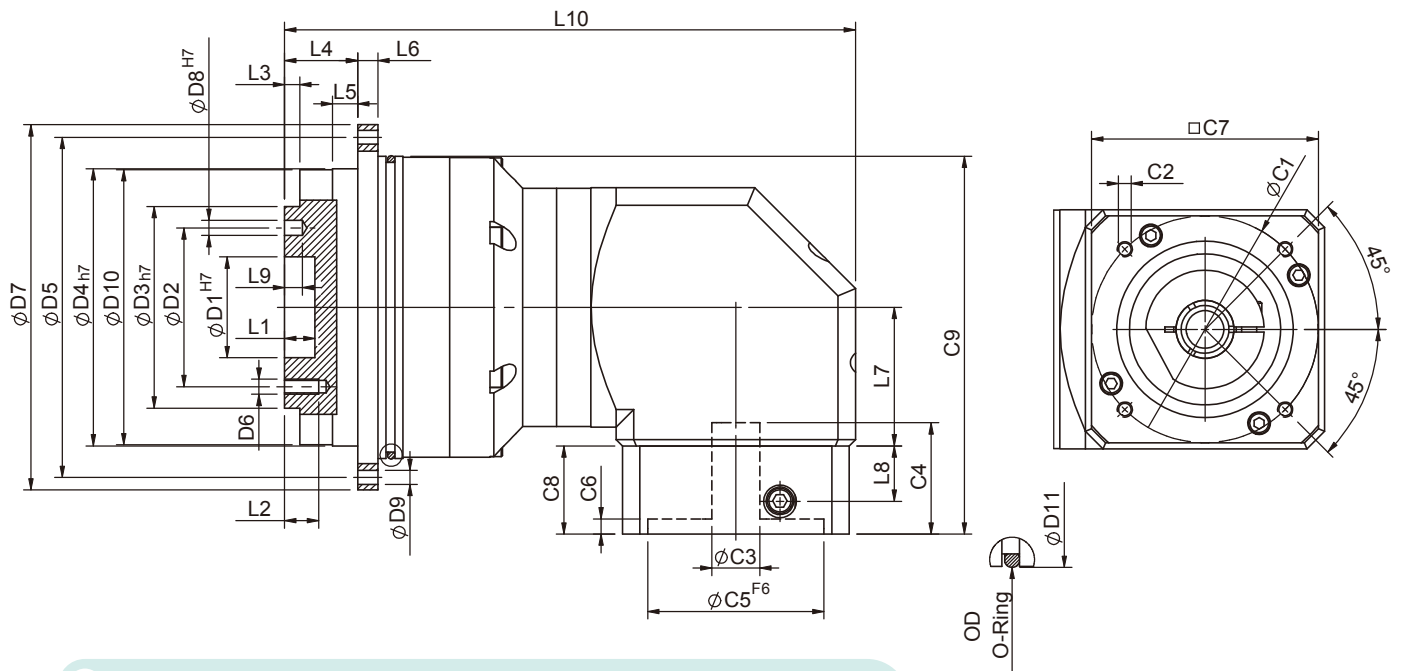
Unit:mm

Dimensions	PGFR42	PGFR60	PGFR90
D1 ^{H7}	12	20	31.5
D2	20	31.5	50
D3 _{h7}	28	40	63
D4 _{h7}	47	64	90
D5	67	79	109
D6	M3x0.5P	M5x0.8P	M6x1.0P
D7	72	86	118
D8 ^{H7}	3	5	6
D9	3.4	4.5	5.5
D10	46.2	63.2	89.2
D11	60	70	95
L1	4	8	12
L2	6	7.2	12
L3	3	3	6
L4	19.5	19.5	29
L5	7	7	10
L6	4	4	7
L7	32.2	44.8	55
L8	13.5	21.5	22
L9	4	6	7
L10	119.9	159.3	216.1
C1 *	46	70	90
C2 *	M4x0.7P	M5x0.8P	M6x1.0P
C3 *	≤8/≤11	≤14/≤19	≤19/≤24
C4 *	29	34	44
C5 ^{F6*}	30	50	70
C6 *	6	5	5
C7 *	42.6	60	90
C8 *	25	33	35
C9 *	78.5	112.8	137.5
OD	56x2	66x2	90x3

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

* Specification subject to change without notice.

PGFR Double Stage Dimensions-2



Specifications

Unit:mm

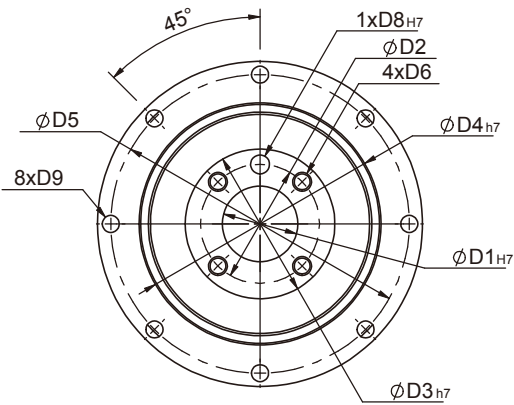
Dimensions	PGFR60T	PGFR90T	PGFR115T	PGFR142T
D1 ^{H7}	20	31.5	40	50
D2	31.5	50	63	80
D3 _{h7}	40	63	80	100
D4 _{h7}	64	90	110	140
D5	79	109	135	168
D6	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P
D7	86	118	145	179
D8 ^{H7}	5	6	6	8
D9	4.5	5.5	5.5	6.6
D10	63.2	89.2	109.2	139.2
D11	70	95	120	152
L1	8	12	12	12
L2	7.2	12	13.5	16
L3	3	6	6	6
L4	19.5	29	29	38
L5	7	10	10	14.6
L6	4	7	8	10
L7	32.2	44.8	55	69
L8	13.5	21.5	22	32
L9	6	7	7	7
L10	126.6	171.3	226.6	270.7
C1 *	46	70	90	90
C2 *	M4x0.7P	M5x0.8P	M6x1.0P	M6x1.0P
C3 *	≤8/≤11	≤14/≤19	≤19/≤24	≤24/≤32
C4 *	29	34	44	53.5
C5 ^{F6} *	30	50	70	70
C6 *	6	5	5	5.5
C7 *	42.6	60	90	115
C8 *	25	33	35	48
C9 *	84.4	125.3	150	176.5
OD	66x2	90x3	110x3	145x3

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

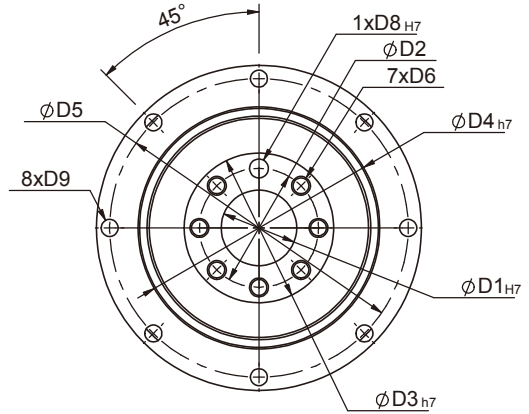
★ Specification subject to change without notice.

PGFR Flange Dimensions

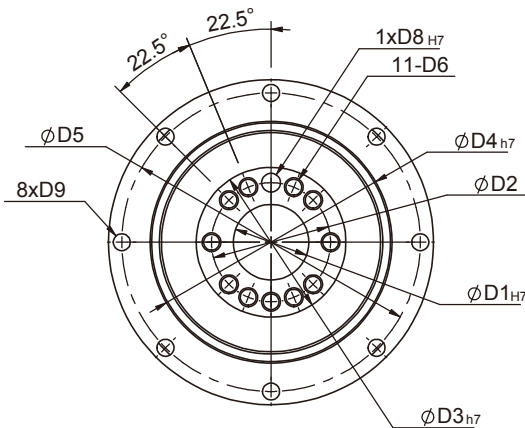
PGFR42



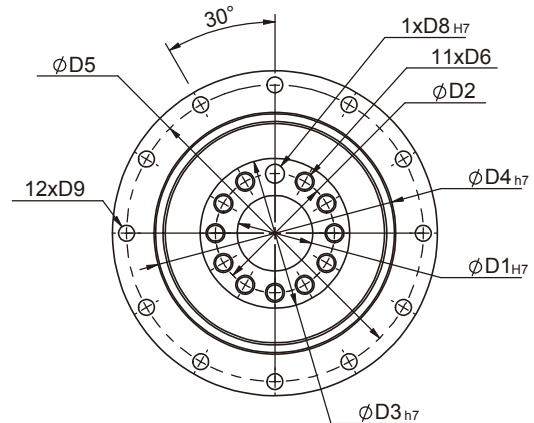
PGFR60
PGFR90



PGFR115



PGFR142



Specifications

Unit:mm

Dimensions	PGFR42	PGFR60	PGFR90	PGFR115	PGFR142
D1 _{H7}	12	20	31.5	40	50
D2	20	31.5	50	63	80
D3 _{h7}	28	40	63	80	100
D4 _{h7}	47	64	90	110	140
D5	67	79	109	135	168
D6	M3x0.5P	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P
D8 _{H7}	3	5	6	6	8
D9	3.4	4.5	5.5	5.5	6.6

★ Specification subject to change without notice.

PGFR Specifications Table

Specifications		Stage	Ratio	PGFR-42	PGFR-60	PGFR-90	PGFR-115	PGFR-142
Nominal Output Torque T_{2N}	N • m	1	3	-	40	105	180	340
			4	16	43	110	240	500
			5	17	50	130	290	600
			7	14	44	125	270	530
			10	17	50	130	260	540
			14	14	44	125	270	530
		20	11	37	95	220	430	
		Stage	Ratio	PGFR-42	PGFR-60/ PGFR-60T	PGFR-90/ PGFR-90T	PGFR-115T	PGFR-142T
		2	15	-	40	105	180	600
			20	16	43	110	240	600
			25	17	50	130	290	600
			30	17	40	105	180	600
			35	17	50	130	290	600
			40	16	43	110	240	600
			50	17	50	130	290	600
			70	14	44	125	270	530
			100	11	37	95	220	430
			140	14	44	125	270	530
		200	11	37	95	220	430	
Emergency Stop Torque T_{2NOT}	N • 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	3-200	5000	5000	4000	4000	3000
Max. Input Speed n_{1max}	rpm	1,2	3-200	10000	10000	8000	8000	5000
Micro Backlash P_0	arcmin	1	3-20	-	-	≤ 4	≤ 2	≤ 2
		2	15-200	-	-	≤ 6	≤ 4	≤ 4
Precision Backlash P_1	arcmin	1	3-20	≤ 6	≤ 6	≤ 6	≤ 4	≤ 4
		2	15-200	≤ 8	≤ 8	≤ 8	≤ 7	≤ 7
Standard Backlash P_2	arcmin	1	3-20	≤ 8	≤ 8	≤ 8	≤ 6	≤ 6
		2	15-200	≤ 10	≤ 10	≤ 10	≤ 9	≤ 9
Torsional Rigidity	N • m /arcmin	1,2	3-200	6	12	28	75	145
Max. Bending Moment M_{2kB}^1	N • m	1,2	3-200	22.5	36	76	140	950
Max. Axial Load F_{2aB}^1	N	1,2	3-200	465	635	1060	1580	6400
Operating Temp.	°C	-10 °C ~ +90 °C						
Service Life	hr	3-200 20,000 (10,000 Continuous operation)						
Efficiency	%	1	3-20	≥ 95%				
		2	15-200	≥ 92%				
Weight	kg	1	3-20	1.1	2.2	6.3	13.5	25.1
		2	15-200	1.6	2.9/2.1	8.3/5.0	14.8	26.7
Mounting Position	-	1,2	3-200	Any direction				
Noise Level ²	dBA/1m	1,2	3-200	62	64	66	68	70
Protection Class	-	1,2	3-200	IP65				
Lubrication	-	1,2	3-200	Synthetic Lubricant				
Inertia (J1)								
Stage	Ratio	unit		PGFR-42	PGFR-60	PGFR-90	PGFR-115	PGFR-142
1	3/4/5/7	Kg • cm ²		0.06	0.40	2.28	6.87	24.2
	10/14/20			0.05	0.30	1.45	4.76	14.5
2	15/20/25/35			0.06	0.40(0.08)	2.28(0.72)	3.02	7.83
	others			0.05	0.30(0.06)	1.45(0.38)	1.64	5.00

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

* 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.

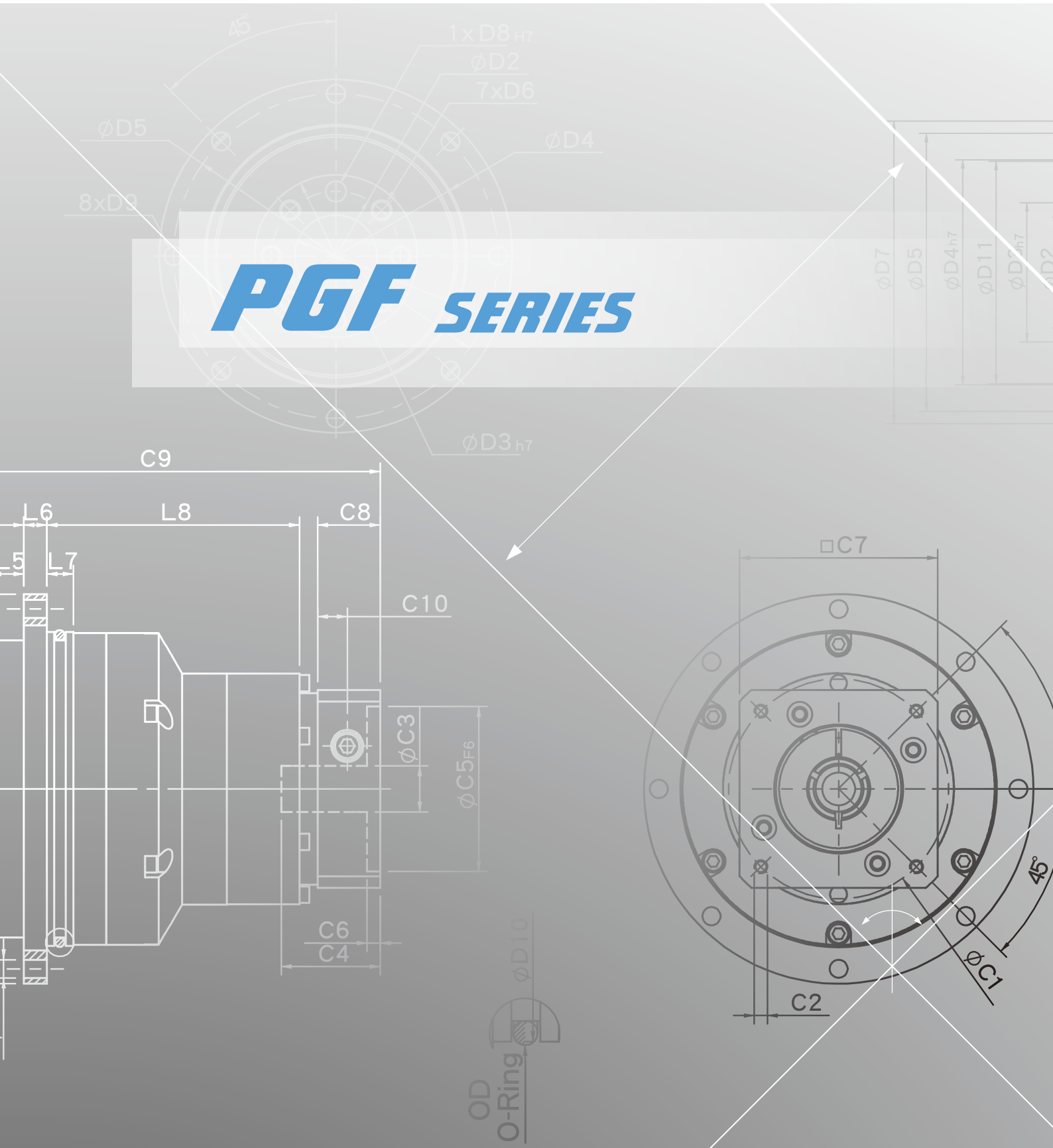
Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

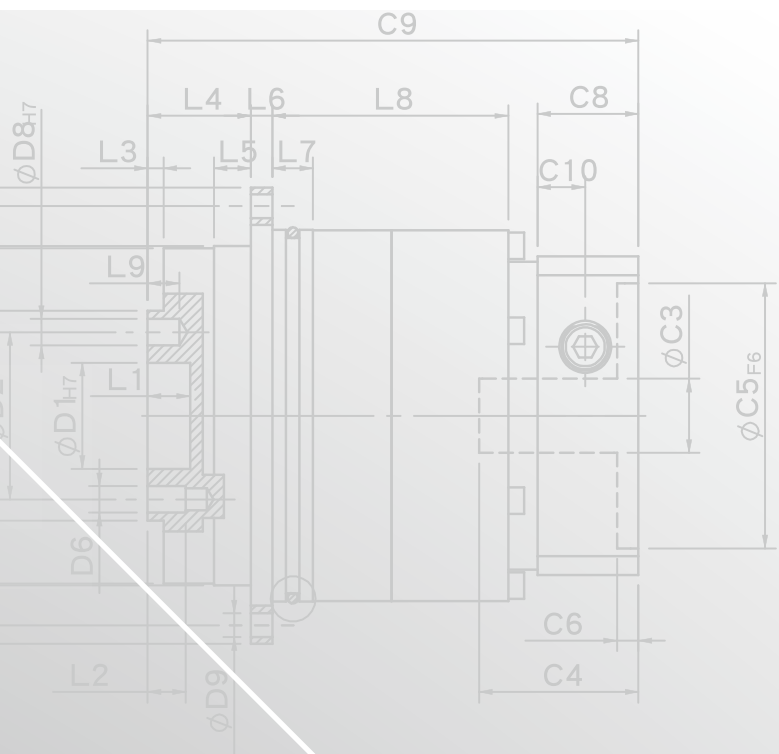
PLANETARY GEARHEADS



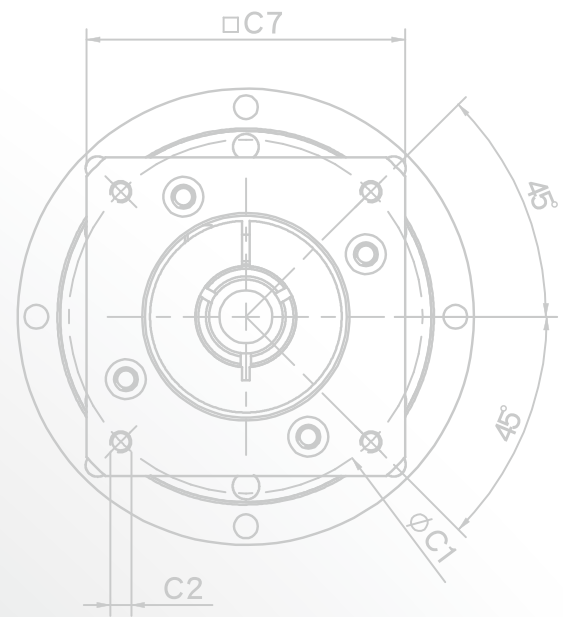
- PHL
- PHFR
- PHF
- PGH
- PUR
- PUL
- PUA
- PGLH
- BGCH
- PGEH
- PGSH
- PGL
- PGC
- PGE
- SGC
- SGE
- PGRH
- PGR
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- PGF
- PBC
- PBE
- PAE
- PAC
- PAN
- PGS
- PNS
- PGW

PGF SERIES

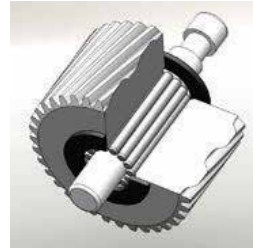




OD
O-Ring ØD10

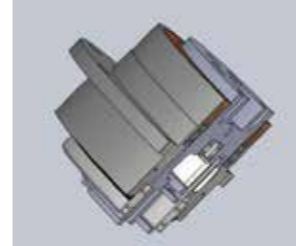
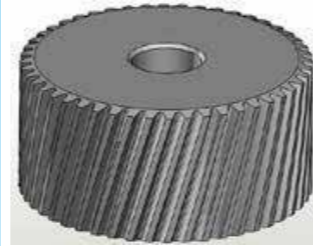


PGF SERIES FEATURES



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.

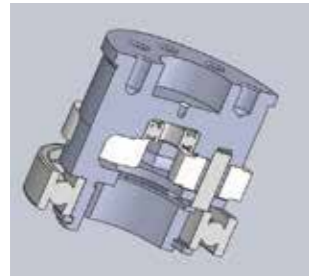
Alloy steel gear with unique heat treatment. Additionally, with gear grinding processing to get the best accuracy, high wear resistance and high impact toughness.



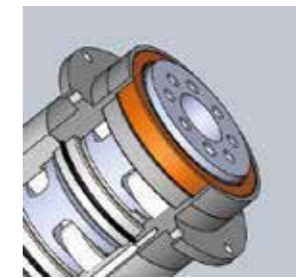
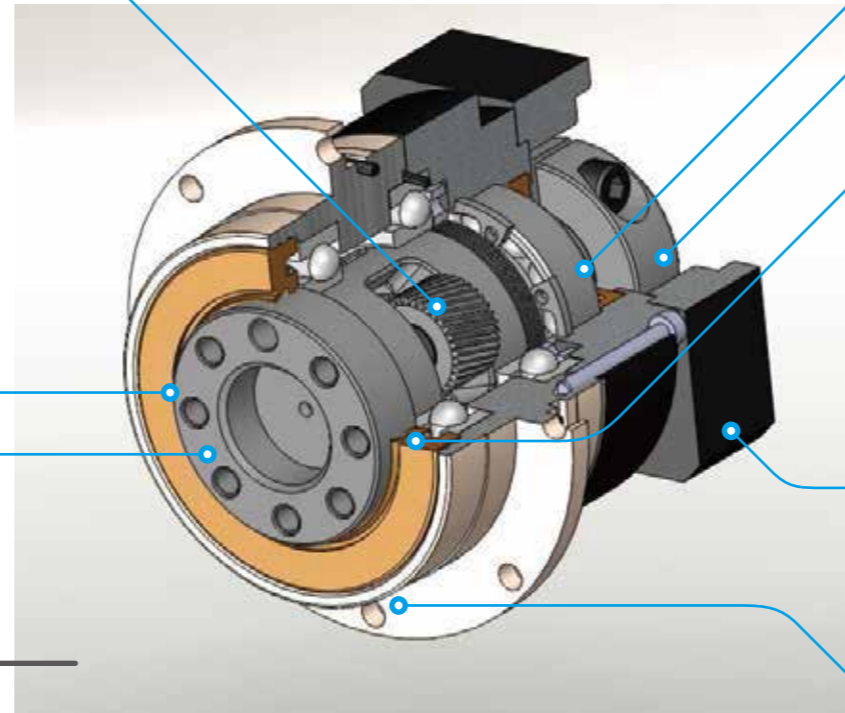
The sun gear bearing is placed directly into the planetary arm bracket, the overall mechanical structure designed to ensure concentricity of the transmission components.



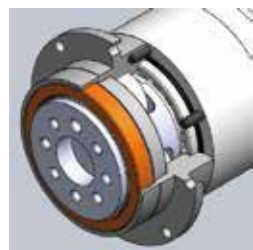
Input-end and motor shaft are coupled through a dynamic balanced collar clamping mechanism to ensure connection interface concentricity and zero slip power transmission at high speed.



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. Protection grade IP65 safeguards fully avoid leaking problem, and given it maintenance-free.

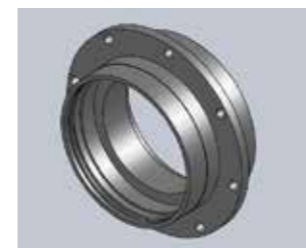


Grinding process to smooth surface of output shaft, and with oil-seal to minimum friction coefficient and reducing start up load; result in the best seal-ability and extended lifespan. Hollow out-put shaft connects perfectly with circular flange drastically reducing the installation space.

PGF Series overall design suitable for combination operation with servo motor high-speed input and achieves maximum torque output. Hollow out-put shaft connects perfectly with circular flange drastically reducing the installation space. Precision gear design and gear processing create a planetary gearhead with low backlash operation, high efficiency, low noise and long lifespan.



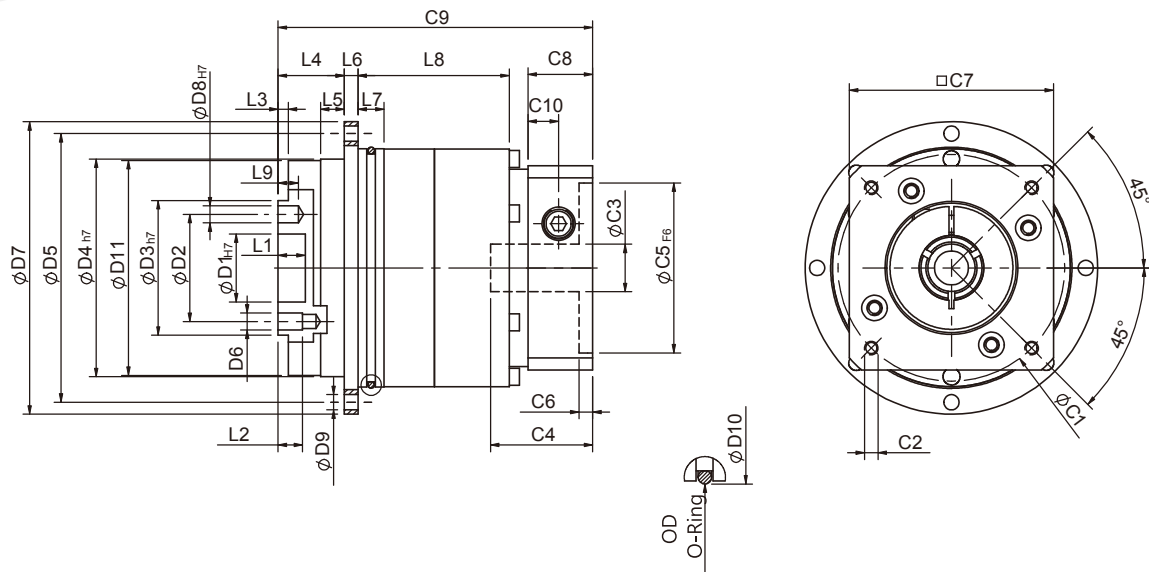
Advanced motor bracket design coupled with the input shaft bushing is easy to mount to any servo or stepper motor.



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.

Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty. 產品因人為原因或天災等因素導致不良或損壞，不在保固範圍內。

PGF Single Stage Dimensions



Specifications

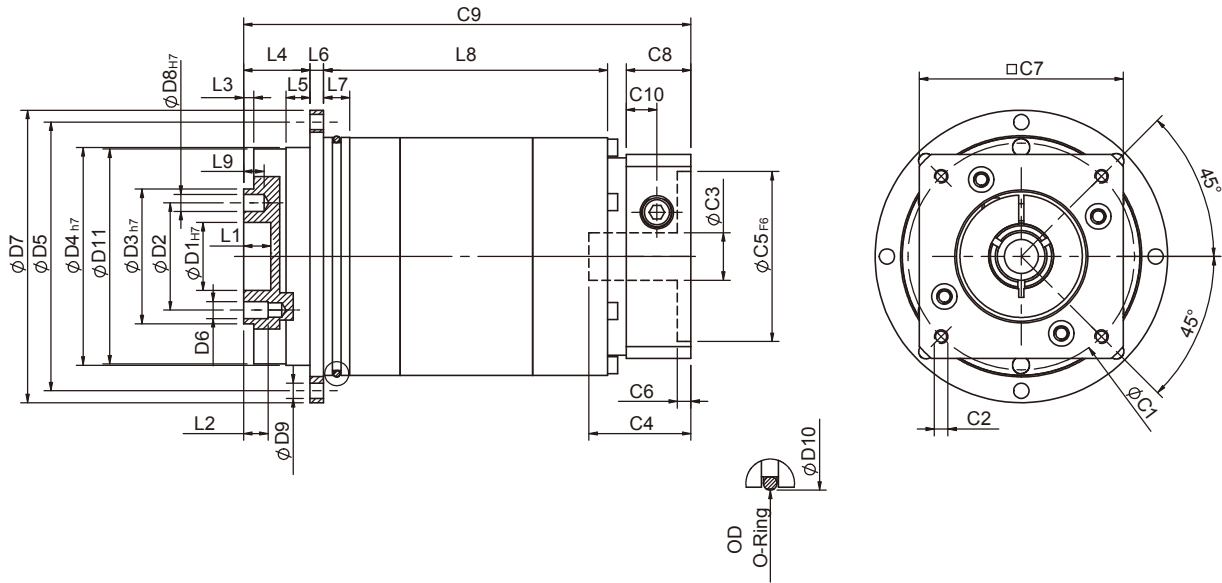
Unit:mm

Dimensions	PGF42	PGF60	PGF90	PGF115	PGF142
D1 _{H7}	12	20	31.5	40	50
D2	20	31.5	50	63	80
D3 _{h7}	28	40	63	80	100
D4 _{h7}	47	64	90	110	140
D5	67	79	109	135	168
D6	M3x0.5P	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P
D7	72	86	118	145	179
D8 _{H7}	3	5	6	6	8
D9	3.4	4.5	5.5	5.5	6.6
D10	60	70	95	120	152
D11	46.2	63.2	89.2	109.2	139.2
L1	4	8	12	12	12
L2	6	7.2	12	13.5	16
L3	3	3	6	6	6
L4	19.5	19.5	29	29	38
L5	7	7	10	10	14.6
L6	4	4	7	8	10
L7	5	7.7	8	10	12
L8	25	29.5	35	50.5	65
L9	4	6	7	7	7
C1 ²	46	70	90	115	145
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P
C3 ²	≤8/≤11	≤14/≤19	≤19/≤24	≤24/≤32/≤38	≤35/≤38
C4 ²	28.6	37.5	41.7	51.1	66.7
C5 ² _{F6}	30	50	70	95	110
C6 ²	4.1	4.5	6	6	5.5
C7 ²	42	60	90	115	140
C8 ²	17	20	26	30	35
C9 ²	75.3	85.5	105	127.5	168.5
C10 ²	7.4	9	11.3	13.9	17.8
OD	56x2	66x2	90x3	110x3	145x3

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

★ Specification subject to change without notice.

PGF Double Stage Dimensions-1



Specifications

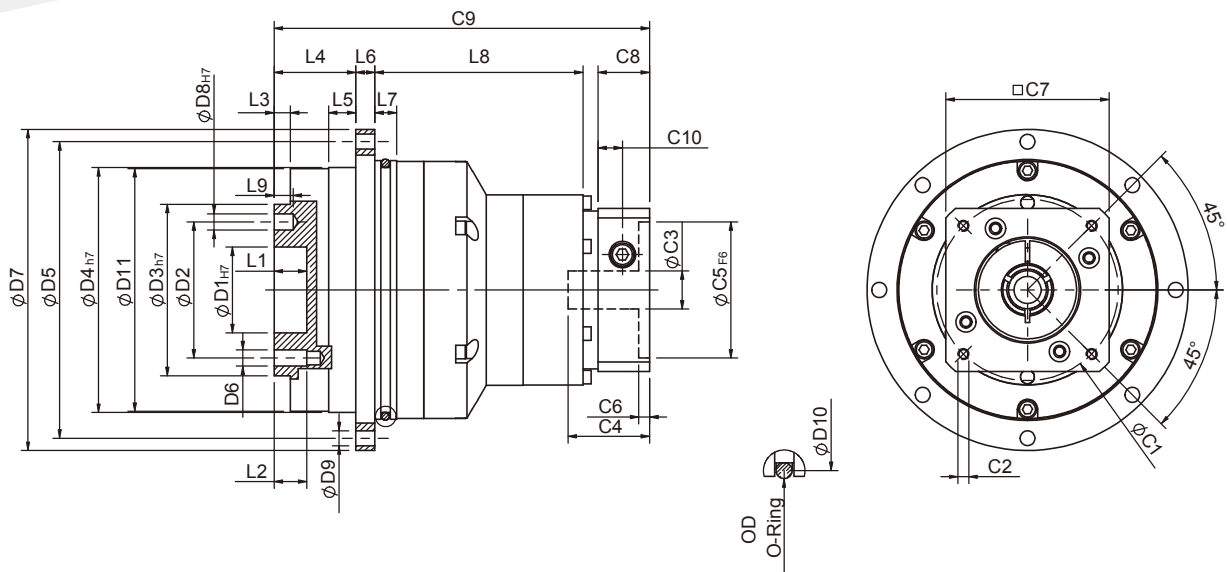
Unit:mm

Dimensions	PGF42	PGF60	PGF90
D1 _{H7}	12	20	31.5
D2	20	31.5	50
D3 _{h7}	28	40	63
D4 _{h7}	47	64	90
D5	67	79	109
D6	M3x0.5P	M5x0.8P	M6x1.0P
D7	72	86	118
D8 _{H7}	3	5	6
D9	3.4	4.5	5.5
D10	60	70	95
D11	46.2	63.2	89.2
L1	4	8	12
L2	6	7.2	12
L3	3	3	6
L4	19.5	19.5	29
L5	7	7	10
L6	4	4	7
L7	5	7.7	8
L8	54.5	68.5	80
L9	4	6	7
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	≤8/≤11	≤14/≤19	≤19/≤24
C4 ²	28.6	37.5	41.7
C5 ² _{F6}	30	50	70
C6 ²	4.1	4.5	6
C7 ²	42	60	90
C8 ²	17	20	26
C9 ²	103	124.5	149.1
C10 ²	7.4	9	11.3
OD	56x2	66x2	90x3

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

★ Specification subject to change without notice.

PGF Double Stage Dimensions-2



Specifications

Unit:mm

Dimensions	PGF60T	PGF90T	PGF115T	PGF142T
D1 _{H7}	20	31.5	40	50
D2	31.5	50	63	80
D3 _{h7}	40	63	80	100
D4 _{h7}	64	90	110	140
D5	79	109	135	168
D6	M5x0.8P	M6x1.0P	M6x1.0P	M8x1.25P
D7	86	118	145	179
D8 _{H7}	5	6	6	8
D9	4.5	5.5	5.5	6.6
D10	70	95	120	152
D11	63.2	89.2	109.2	139.2
L1	8	12	12	12
L2	7.2	12	13.5	16
L3	3	6	6	6
L4	19.5	29	29	38
L5	7	10	10	14.6
L6	4	7	8	10
L7	7.7	8	10	12
L8	61.2	68	89.5	110
L9	6	7	7	7
C1 ²	46	70	90	115
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P
C3 ²	≤8/≤11	≤14/≤19	≤19/≤24	≤24/≤32/≤38
C4 ²	28.6	37.5	41.7	51.1
C5 ² _{F6}	30	50	70	95
C6 ²	4.1	4.5	6	6
C7 ²	42	60	90	115
C8 ²	17	20	26	30
C9 ²	109.7	136.5	159.6	198
C10 ²	7.4	9	11.3	13.9
OD	66x2	90x3	110x3	145x3

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

★ Specification subject to change without notice.

PGF Specifications Table

Specifications		Stage	Ratio	PGF-42	PGF-60	PGF-90	PGF-115	PGF-142
Nominal Output Torque T_{2N}	N • m	1	3	-	40	105	180	340
			4	16	43	110	240	500
			5	17	50	130	290	600
			7	14	44	125	270	530
			10	11	37	95	220	430
		Stage	Ratio	PGF-42	PGF-60(T)	PGF-90(T)	PGF-115T	PGF-142T
		2	15	-	40	105	180	600
			20	16	43	110	240	600
			25	17	50	130	290	600
			30	17	50	130	290	600
			35	17	50	130	290	600
			40	17	50	130	290	600
			50	17	50	130	290	600
			70	14	44	125	270	530
100	11	37	95	220	430			
Emergency Stop Torque 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
Max. Input Speed n_{1max}	rpm	1,2	3-100	10000	10000	8000	8000	5000
Micro Backlash P0	arcmin	1	3-10	≤ 3	≤ 3	≤ 3	≤ 1	≤ 1
		2	12-100	≤ 5	≤ 5	≤ 5	≤ 3	≤ 3
Precision Backlash P1	arcmin	1	3-10	≤ 5	≤ 5	≤ 5	≤ 3	≤ 3
		2	12-100	≤ 7	≤ 7	≤ 7	≤ 5	≤ 5
Standard Backlash P2	arcmin	1	3-10	≤ 7	≤ 7	≤ 7	≤ 5	≤ 5
		2	12-100	≤ 9	≤ 9	≤ 9	≤ 7	≤ 7
Torsional Rigidity	N • m /arcmin	1,2	3-100	6	12	28	75	145
Max. Bending Moment M_{2kB}^1	N • m	1,2	3-100	22.5	36	76	140	950
Max. Axial Load F_{2aB}^1	N	1,2	3-100	465	635	1060	1580	6400
Operating Temp.	°C	-10 °C ~ +90 °C						
Service Life	hr	20,000 (10,000 Continuous operation)						
Efficiency	%	1	3-10	≥ 97%				
		2	12-100	≥ 94%				
Weight	kg	1	3-10	0.7	1.4	3.2	6.0	13.6
		2	12-100	1.1	2.2(1.7)	5.0(4.0)	7.9	17.9
Mounting Position	-	1,2	3-100	Any direction				
Noise Level ²	dB(A)/1m	1,2	3-100	56	58	60	63	65
Protection Class	-	1,2	3-100	IP65				
Lubrication	-	1,2	3-100	Synthetic Lubricant				
Inertia (J1)								
Stage	Ratio	unit		PGF-42	PGF-60	PGF-90	PGF-115	PGF-142
1	3	Kg • cm ²		-	0.19	0.72	2.35	9.05
	4			0.02	0.18	0.67	1.66	7.17
	5			0.02	0.17	0.65	1.50	6.52
	7			0.02	0.14	0.60	1.45	6.17
	10			0.02	0.14	0.58	1.41	6.10
Stage	Ratio			PGF-42	PGF-60(T)	PGF-90(T)	PGF-115T	PGF-142T
2	15/20/25			0.02	0.17(0.02)	0.65(0.17)	0.65	2.35
	30/35/40			0.02	0.14(0.02)	0.60(0.14)	0.60	1.45
	50/70/100			0.02	0.14(0.02)	0.58(0.14)	0.58	1.41

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

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

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

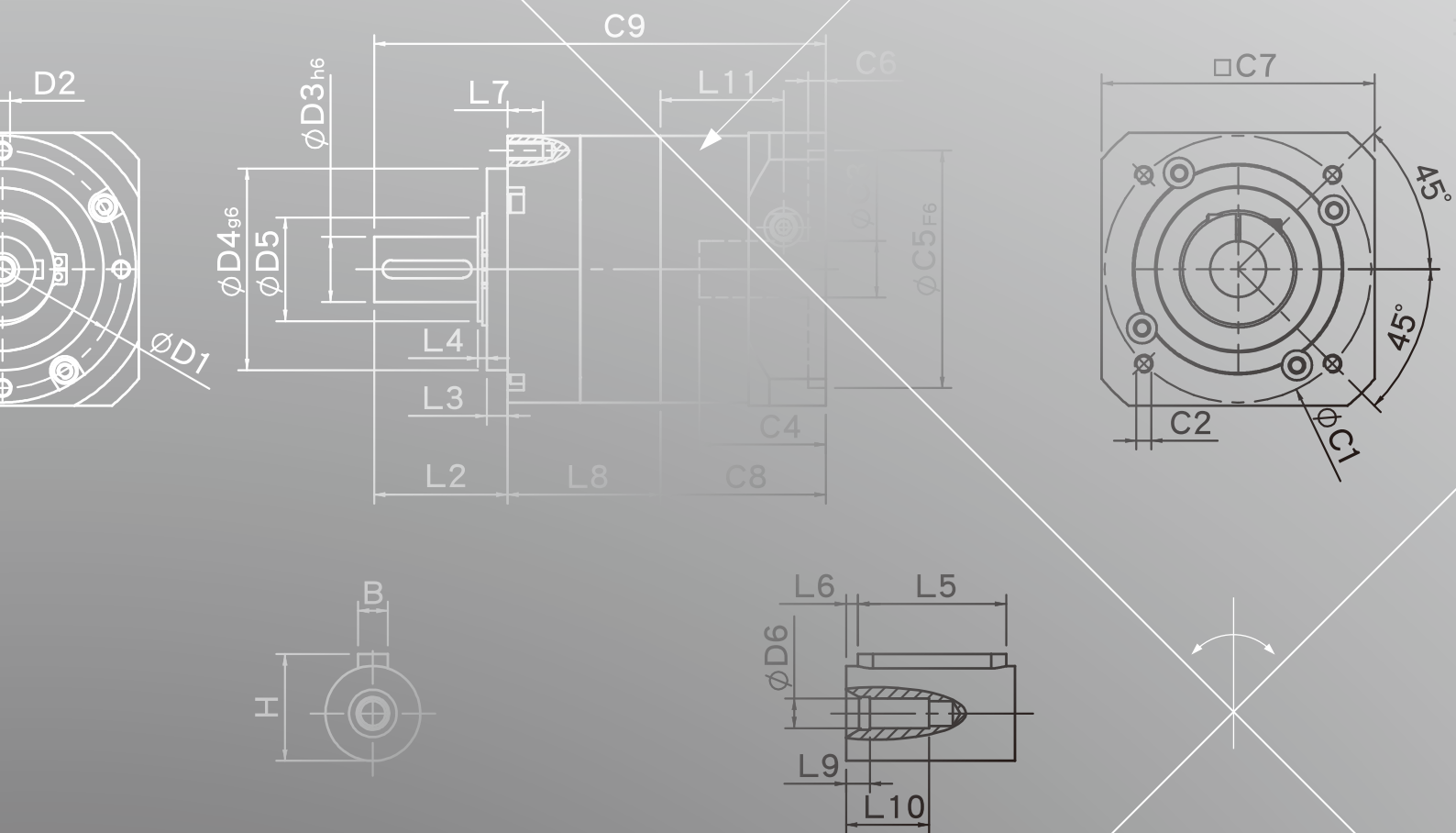
Products due to human error, natural disasters or other factors lead to poor or damaged, will not be covered under warranty.

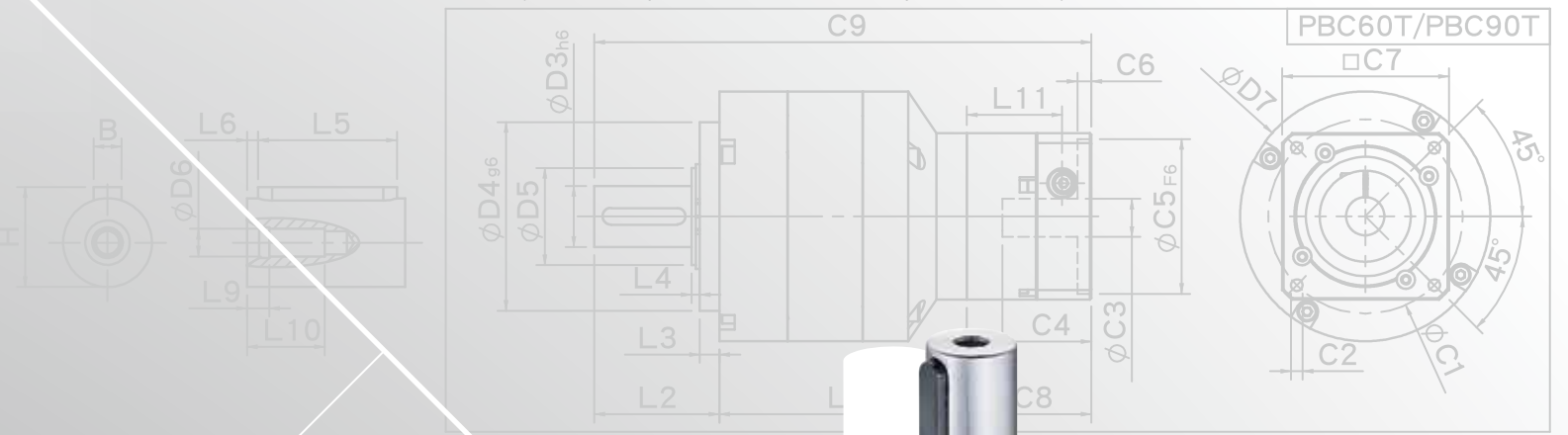
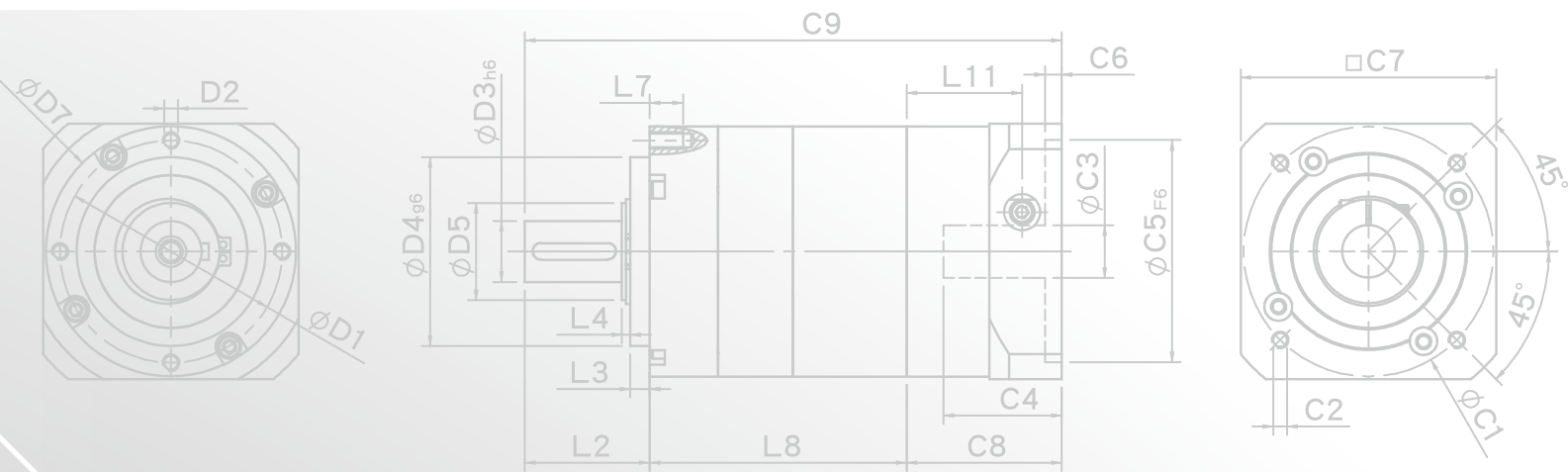
PLANETARY GEARHEADS



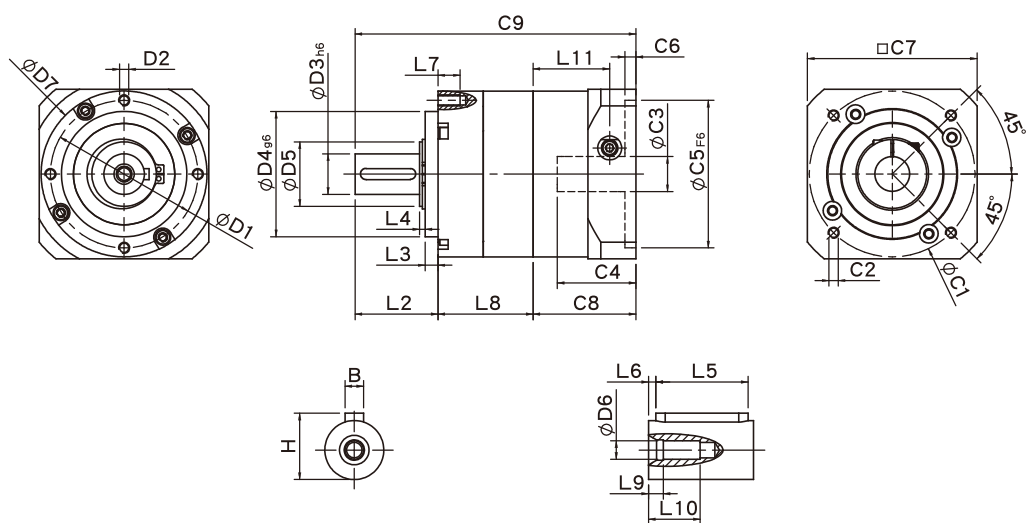
- PHL
- PHFR
- PHF
- PGH
- PUR
- PUL
- PUA
- PGLH
- PGCH
- PGEH
- PGSH
- PGL
- PGC
- PGE
- SGC
- SGE
- PGRH
- PGR
- PGFR
- PGF
- PBC
- PBE
- PAE
- PAC
- PAN
- PGS
- PNS
- PGW

PBC SERIES





PBC Single Stage Dimensions



Specifications

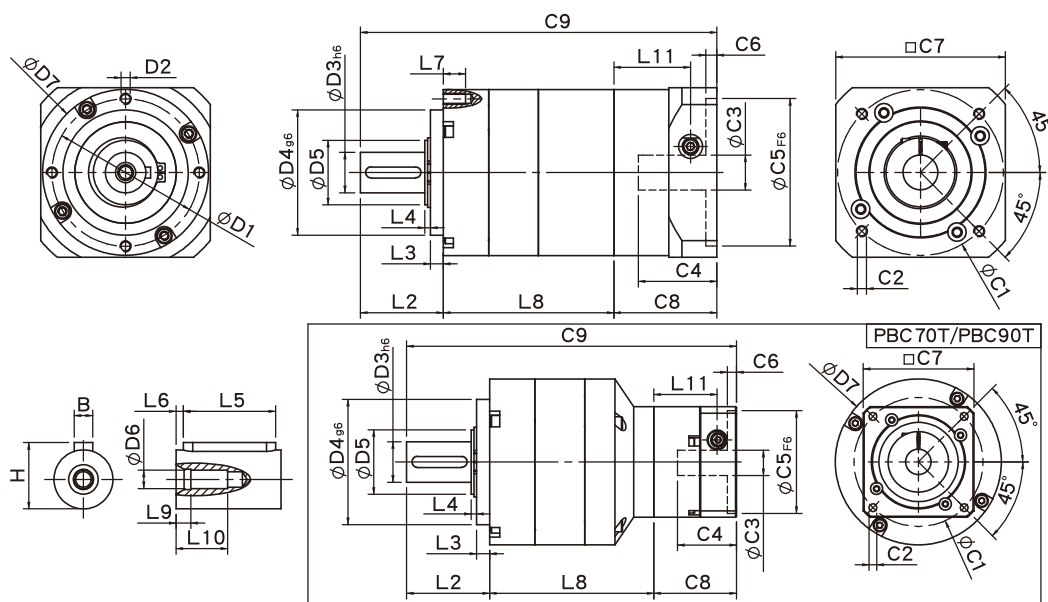
Unit:mm

Dimensions	PBC50	PBC70	PBC90
D1	44	62	80
D2	M4x0.7P	M5x0.8P	M6x1.0P
D3 _{h6}	12	16	22
D4 _{g6}	35	52	68
D5	15	20	35
D6	M4x0.7P	M5x0.8P	M8x1.25P
D7	50	70	90
L2	26	36	45
L3	5.5	5	7
L4	2.6	2.7	3
L5	15	25	30
L6	2	2	3
L7	8	10	12
L8	32.4	49.6	54.4
L9	4	4	4.5
L10	14	16.5	20.5
L11	26.9	34.3	41.55
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	≤8/≤11	≤14/≤19	≤19/≤24/≤28
C4 ²	26.5	33.5	41
C5 ² _{F6}	30	50	70
C6 ²	4	4	6
C7 ²	42.6	60	92
C8 ²	36.4	44.8	55.8
C9 ²	94.8	130.4	155.2
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

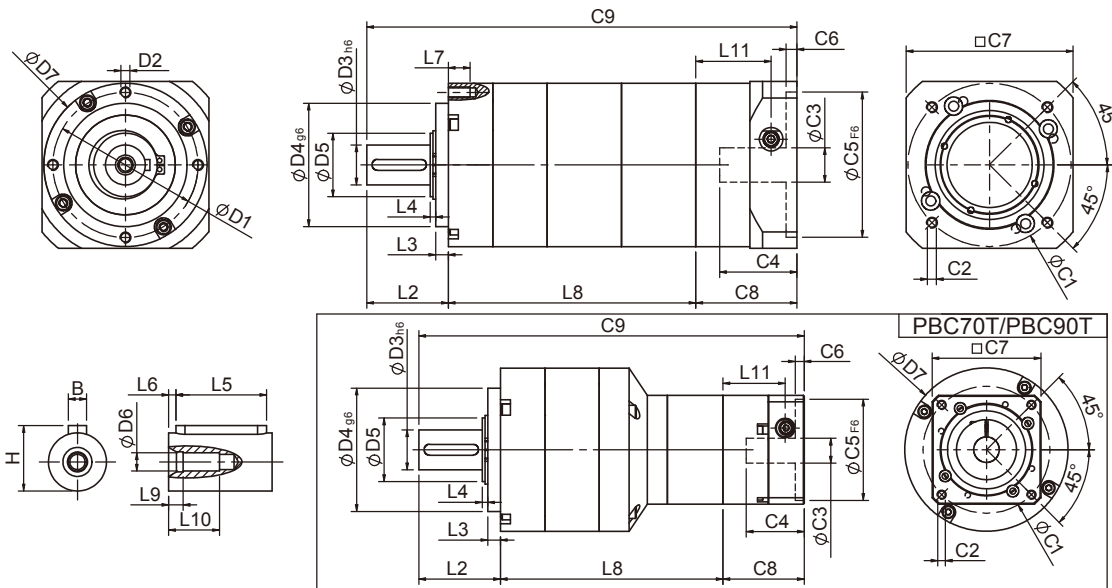
Unit:mm

Dimensions	PBC50	PBC70	PBC70T	PBC90	PBC90T
D1	44	62		80	
D2	M4x0.7P	M5x0.8P		M6x1.0P	
D3 _{h6}	12	16		22	
D4 _{g6}	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 ²	46	70	46	90	70
C2 ²	M4x0.7P	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P
C3 ²	≤8/≤11	≤14/≤19	≤8/≤11	≤19/≤24/≤28	≤14/≤19
C4 ²	26.5	33.5	26.5	41	33.5
C5 ² _{F6}	30	50	30	70	50
C6 ²	4	4	4	6	4
C7 ²	42.6	60	42.6	92	60
C8 ²	36.4	44.8	36.4	55.8	44.8
C9 ²	119.7	161.1	148.3	196.2	181.8
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 _{h6}	12	16	22
D4 _{g6}	35	52	68
D5	15	20	35
D6	M4x0.7P	M5x0.8P	M8x1.25P
D7	50	70	90
L2	26	36	45
L3	5.5	5	7
L4	2.6	2.7	3
L5	15	25	30
L6	2	2	3
L7	8	10	12
L8	82.2	100.8	122.7
L9	4	4	4.5
L10	14	16.5	20.5
L11	26.9	26.9	34.3
C1 ²	46	46	70
C2 ²	M4x0.7P	M4x0.7P	M5x0.8P
C3 ²	≤8/≤11	≤8/≤11	≤14/≤19
C4 ²	26.5	26.5	33.5
C5 ² _{F6}	30	30	50
C6 ²	4	4	4
C7 ²	42.6	42.6	60
C8 ²	36.4	36.4	44.8
C9 ²	144.6	173.2	212.5
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.

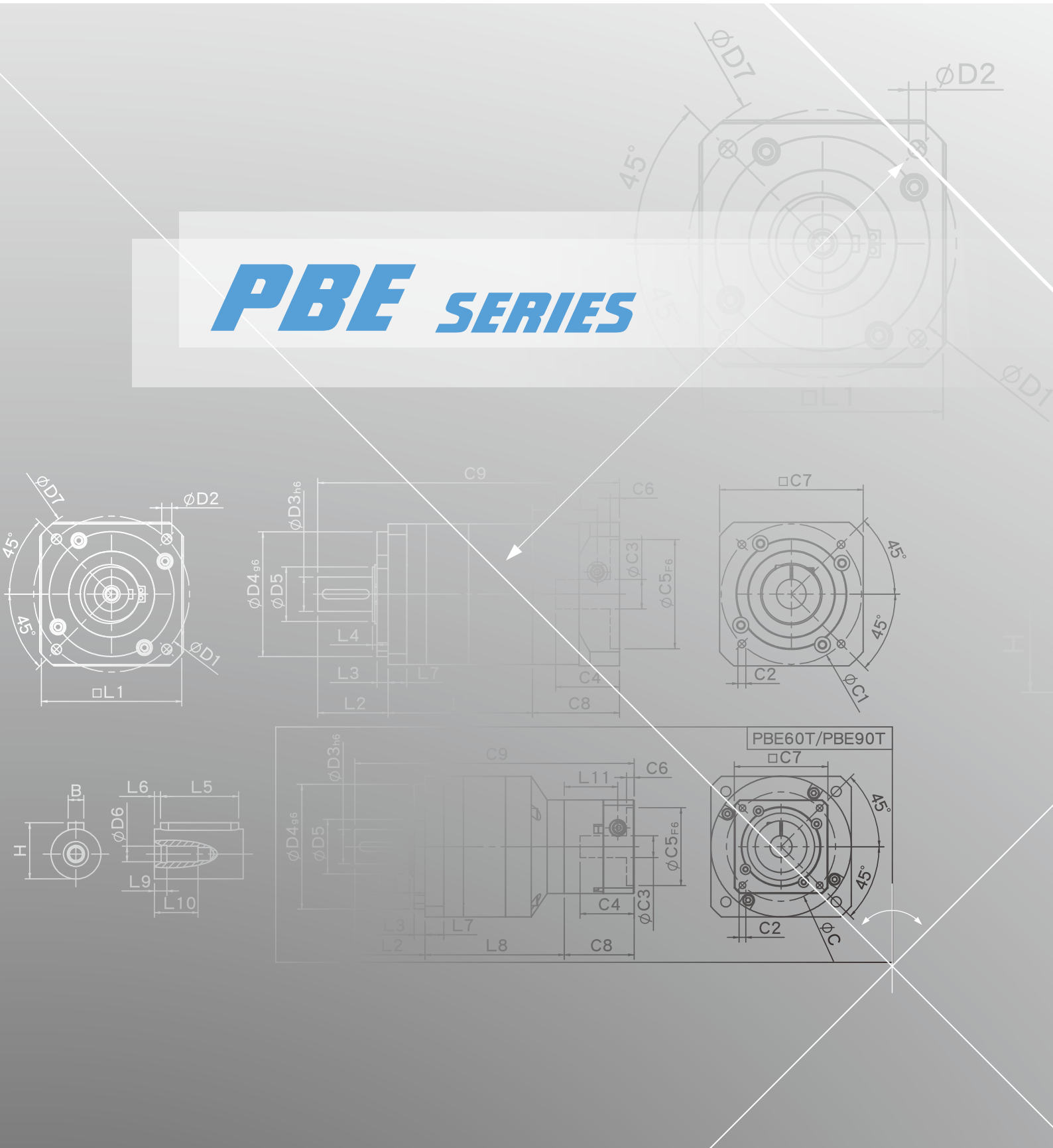
★ Specification subject to change without notice.

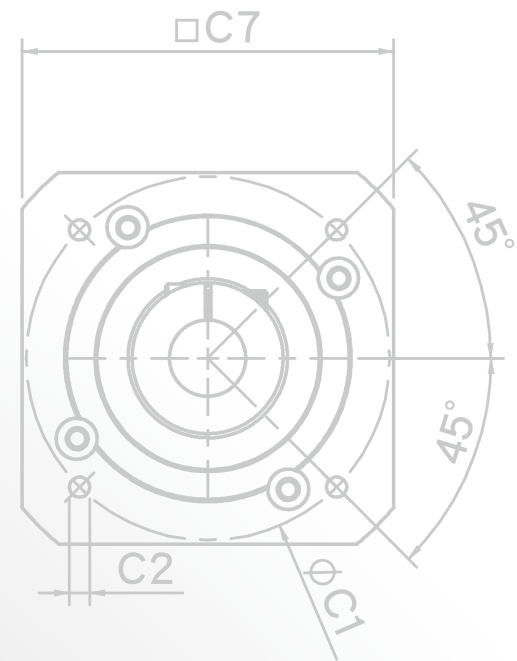
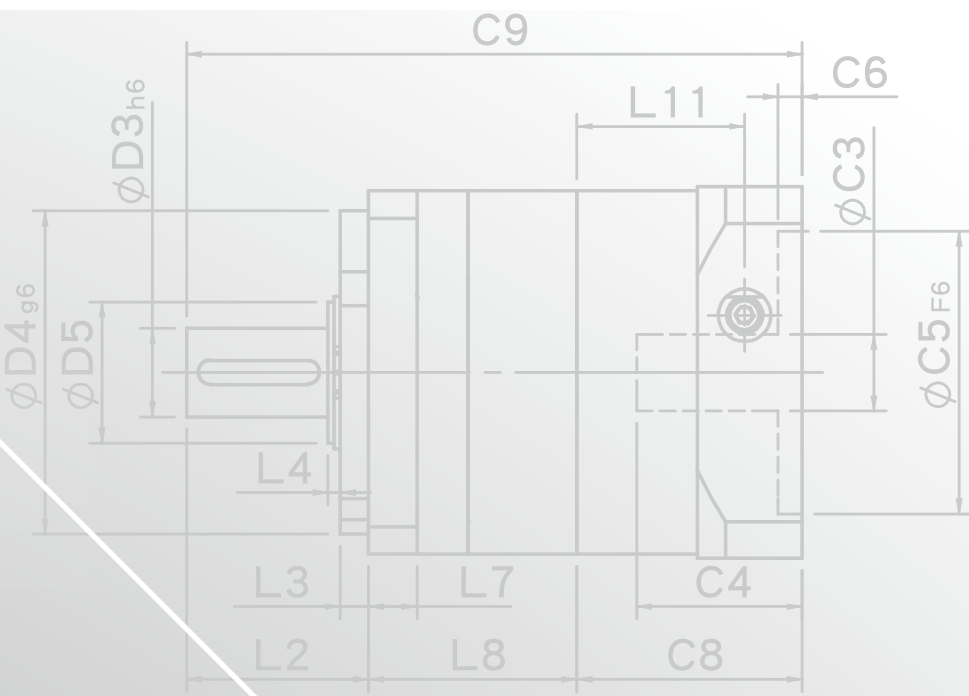
PBC Specifications Table

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 ²	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		
<p>* 1. Applied to the output shaft center at 100 rpm.</p> <p>* 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.</p> <p>* 3. The inertia value of input shaft is same as that of the PAE series.</p> <p>※ The above figures/specifications are subject to change without prior notice.</p>						

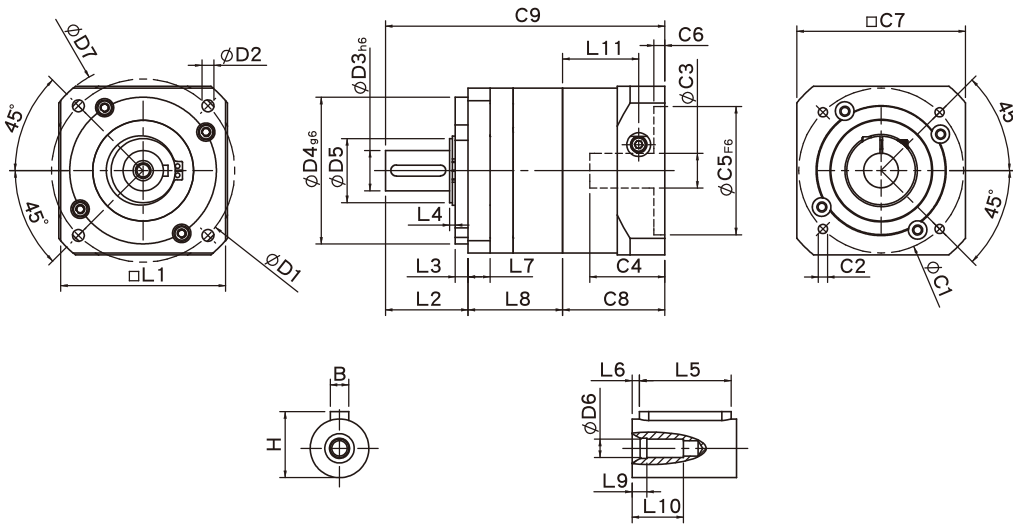
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PBE SERIES





PBE Single Stage Dimensions



Specifications

Unit:mm

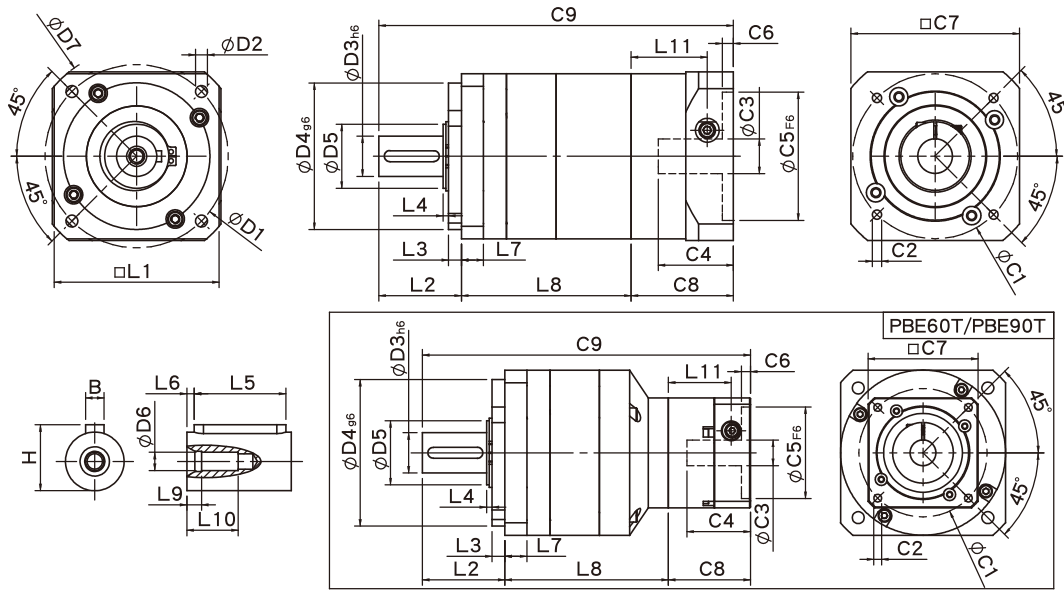
Dimensions	PBE42	PBE60	PBE90
D1	50	70	100
D2	3.4	5.5	6.5
D3 _{h6}	13	16	22
D4 _{g6}	35	50	80
D5	15	20	35
D6	M4x0.7P	M5x0.8P	M8x1.25P
D7	56	80	118
L1	42.6(44) ¹	60	90
L2	26	36	45
L3	5.5	5	7
L4	2.6	2.7	3
L5	15	25	30
L6	2	2	3
L7	8	10	12
L8	32.4	49.6	54.4
L9	4	4	4.5
L10	14	16.5	20.5
L11	26.9	34.3	41.5
C1 ²	46	70	90
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P
C3 ²	$\leq 8/\leq 11$	$\leq 14/\leq 19$	$\leq 19/\leq 24/\leq 28$
C4 ²	26.5	33.5	41
C5 ² _{F6}	30	50	70
C6 ²	4	4	6
C7 ²	42.6	60	92
C8 ²	36.4	44.8	55.8
C9 ²	94.8	130.4	155.2
B	5	5	6
H	15	18	24.5

★ L1=44 when gear ratio is 10.

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

★ Specification subject to change without notice.

PBE Double Stage Dimensions



Specifications

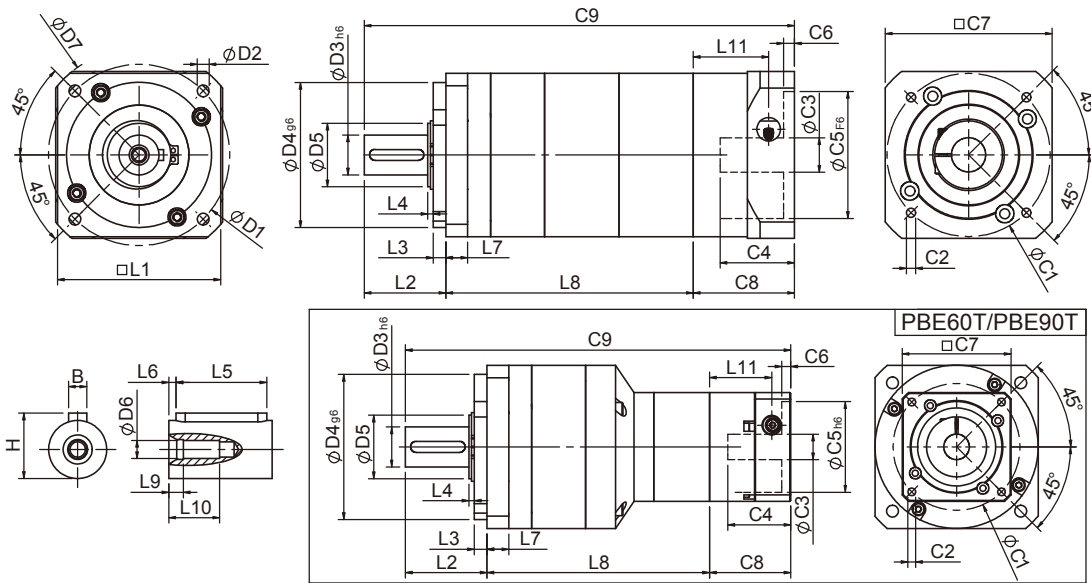
Unit:mm

Dimensions	PBE42	PBE60/PBE60T		PBE90/PBE 90T	
D1	50	70		100	
D2	3.4	5.5		6.5	
D3 _{h6}	13	16		22	
D4 _{g6}	35	50		80	
D5	15	20		35	
D6	M4x0.7P	M5x0.8P		M8x1.25P	
D7	56	80		118	
L1	42.6	60		90	
L2	26	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 ²	46	70		90	70
C2 ²	M4x0.7P	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P
C3 ²	≤8/≤11	≤14/≤19	≤8/≤11	≤19/≤24/≤28	≤14/≤19
C4 ²	26.5	33.5	26.5	41	33.5
C5 ² F ₆	30	50	30	70	50
C6 ²	4	4	4	6	4
C7 ²	42.6	60	42.6	92	60
C8 ²	36.4	44.8	36.4	55.8	44.8
C9 ²	119.7	161.1	148.3	196.2	181.8
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 _{h6}	13	16	22
D4 _{g6}	35	50	80
D5	15	20	35
D6	M4x0.7P	M5x0.8P	M8x1.25P
D7	56	80	118
L1	42.6	60	90
L2	26	36	45
L3	5.5	5	7
L4	2.6	2.7	3
L5	15	25	30
L6	2	2	3
L7	8	10	12
L8	82.2	100.8	122.7
L9	4	4	4.5
L10	14	16.5	20.5
L11	26.9	26.9	34.3
C1 ²	46	46	70
C2 ²	M4x0.7P	M4x0.7P	M5x0.8P
C3 ²	≤8/≤11	≤8/≤11	≤14/≤19
C4 ²	26.5	26.5	33.5
C5 ² _{F6}	30	30	50
C6 ²	4	4	4
C7 ²	42.6	42.6	60
C8 ²	36.4	36.4	44.8
C9 ²	144.6	173.2	212.5
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.

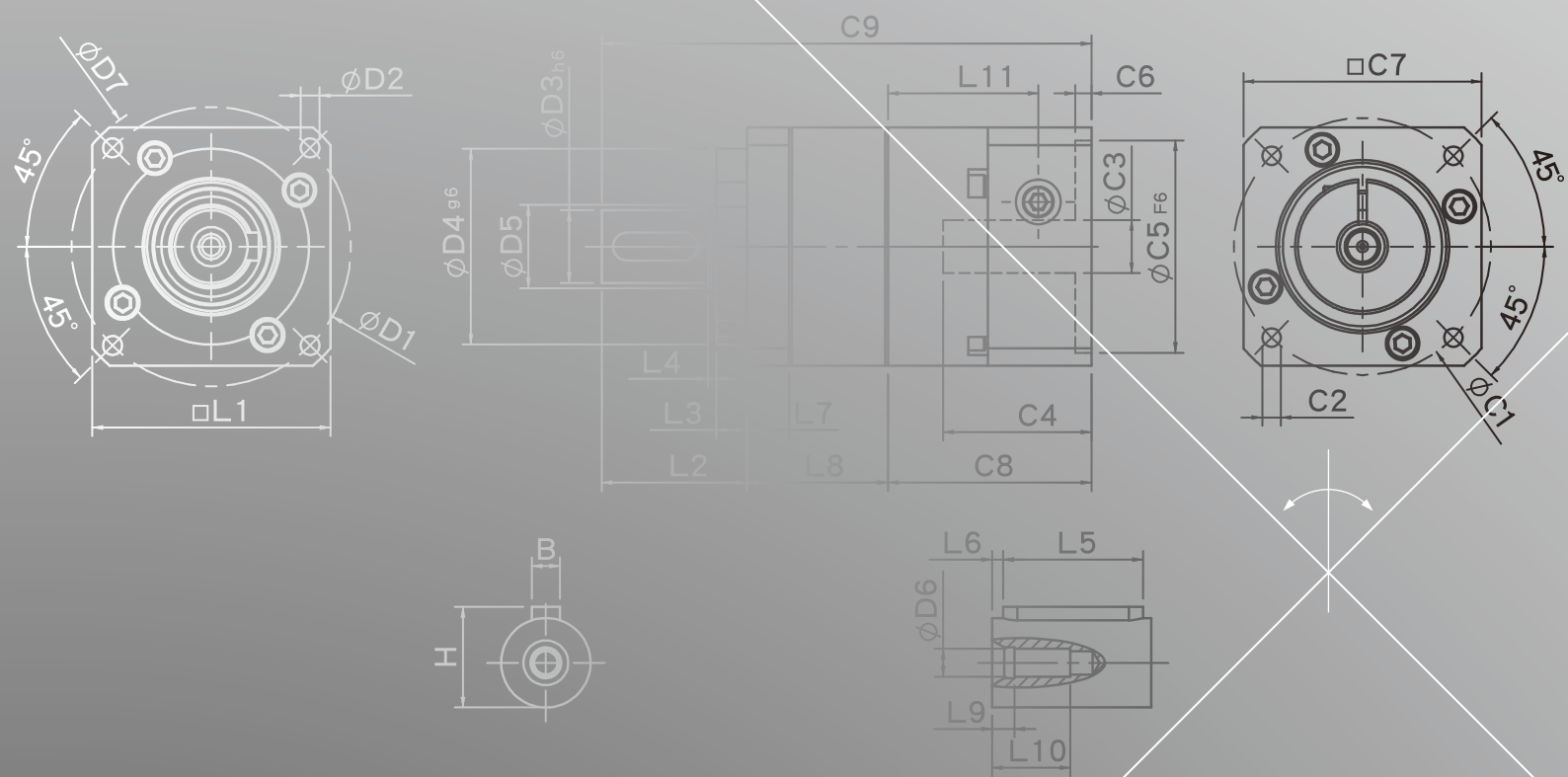
★ Specification subject to change without notice.

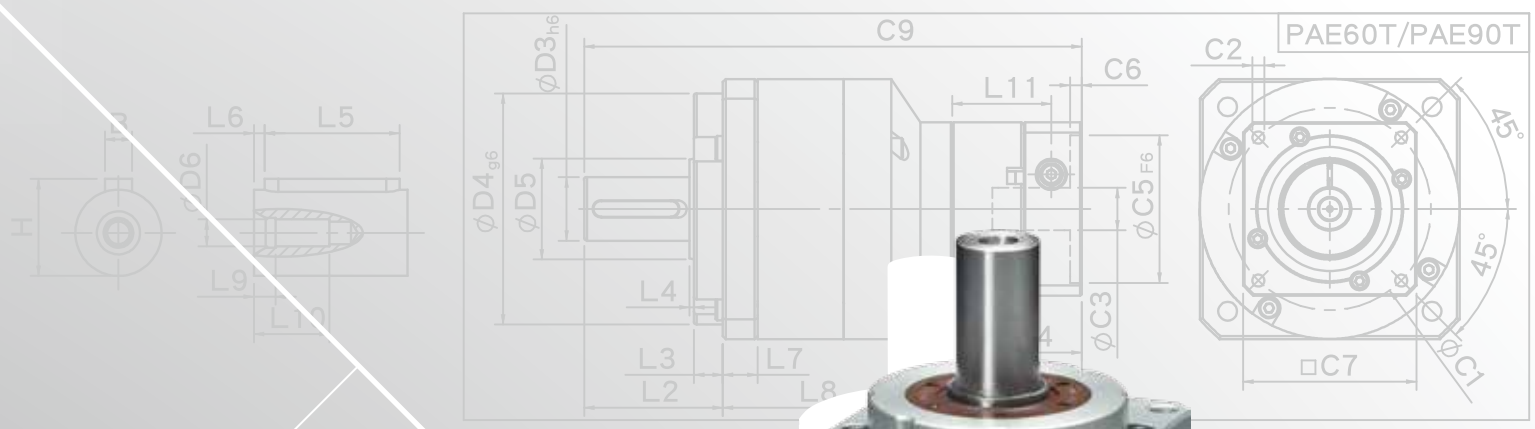
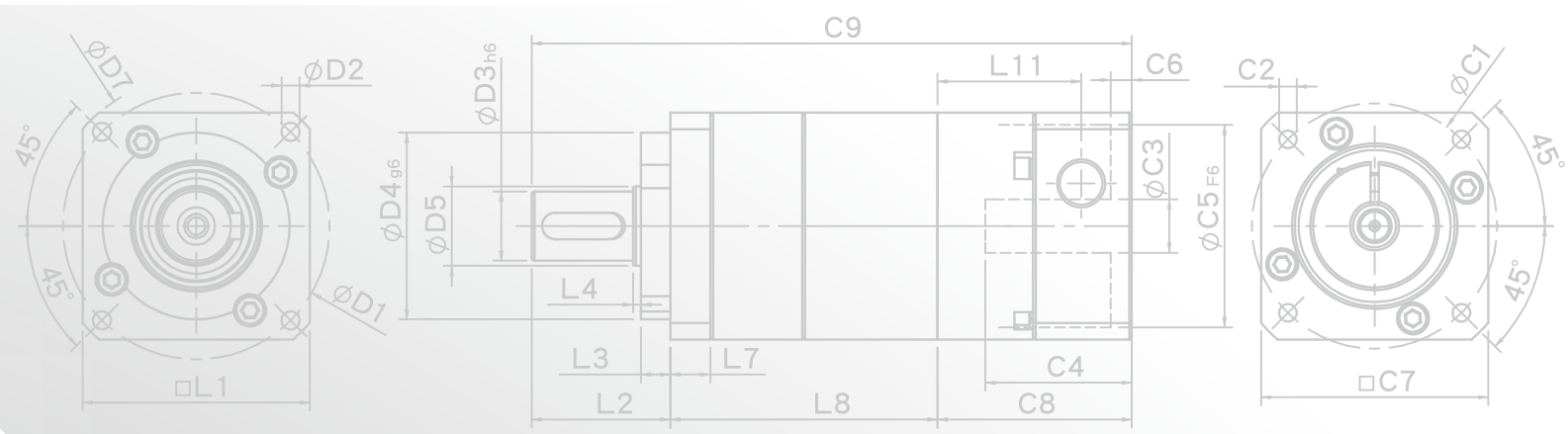
PBE Specifications Table

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 ²	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		
<p>* 1. Applied to the output shaft center at 100 rpm.</p> <p>* 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.</p> <p>* 3. The inertia value of input shaft is same as that of the PAE series.</p> <p>※ The above figures/specifications are subject to change without prior notice.</p>						

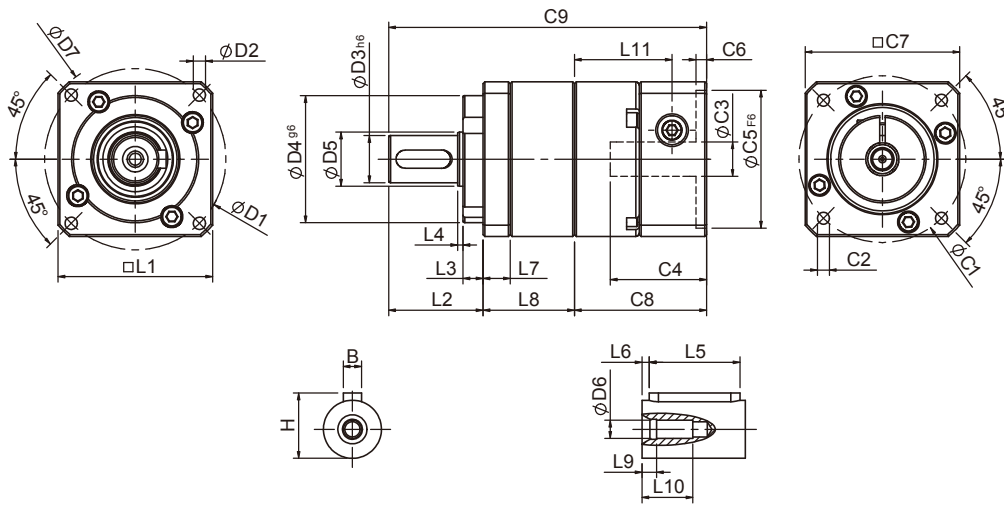
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PAE SERIES





PAE Single Stage Dimensions



Specifications

Unit:mm

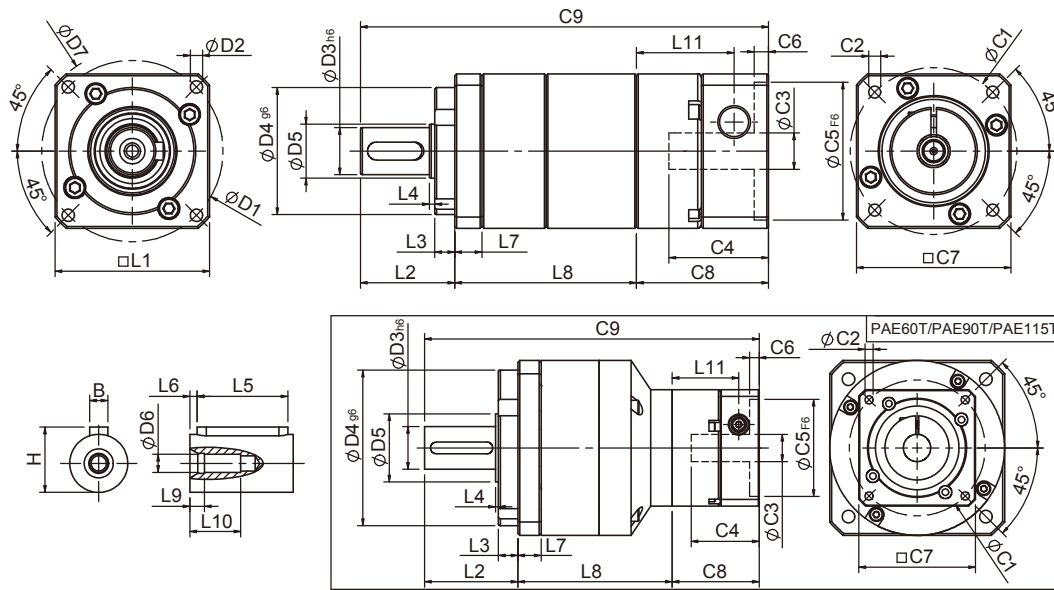
Dimensions	PAE42	PAE60	PAE90	PAE115
D1	50	70	100	130
D2	3.4	5.5	6.5	9
D3 _{h6}	13	16	22	32
D4 _{g6}	35	50	80	110
D5	15	20	35	45
D6	M4x0.7P	M5x0.8P	M8x1.25P	M12x1.75P
D7	56	80	118	148
L1	42.6(44)	60	90	115
L2	26	37	48	65
L3	5.5	7	10	12
L4	1.5	1.5	1.5	2
L5	15	25	32	40
L6	2	2	3	5
L7	7.3	10	12	16
L8	25	36.3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

★ L1=44 when gear ratio is 10.

★ 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		130
D2	3.4	5.5		6.5		9
D3 _{h6}	13	16		22		32
D4 _{g6}	35	50		80		110
D5	15	20		35		45
D6	M4x0.7P	M5x0.8P		M8x1.25P		M12x1.75P
D7	56	80		118		148
L1	42.6(44)	60		90		115
L2	26	37		48		65
L3	5.5	7		10		12
L4	1.5	1.5		1.5		2
L5	15	25		32		40
L6	2	2		3		5
L7	7.3	10		12		16
L8	49.9	67	62.6	82.8	72.3	98.4
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 ²	46	70	46	90	70	90
C2 ²	M4x0.7P	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P	M6x1.0P
C3 ²	≤8/≤11	≤14/≤19	≤8/≤11	≤19/≤24/≤28	≤14/≤19	≤19/≤24/≤28
C4 ²	26.5	33.5	26.5	41	33.5	41
C5 ^{2 F6}	30	50	30	70	50	70
C6 ²	4	4	4	6	4	6
C7 ²	42.6	60	42.6	90	60	90
C8 ²	36.4	44.8	36.4	55.8	44.8	55.8
C9 ²	112.3	148.8	136	186.6	165.1	219.2
B	5	5		6		10
H	15	18		24.5		35

★ L1=44 when gear ratio is 10.

★ 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	4.0	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 ²	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(ψ8)	PAE-60(ψ14)	PAE-90(ψ19)	PAE-115(ψ24)
1	3	Kg · cm ²		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(ψ8)	PAE-60(ψ14)/ PAE-60T(ψ8)	PAE-90(ψ19)/ PAE-90T(ψ14)	PAE-115T (ψ19)
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
<p>* 1. Applied to the output shaft center at 100 rpm.</p> <p>* 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.</p> <p>※ The above figures/specifications are subject to change without prior notice.</p>							

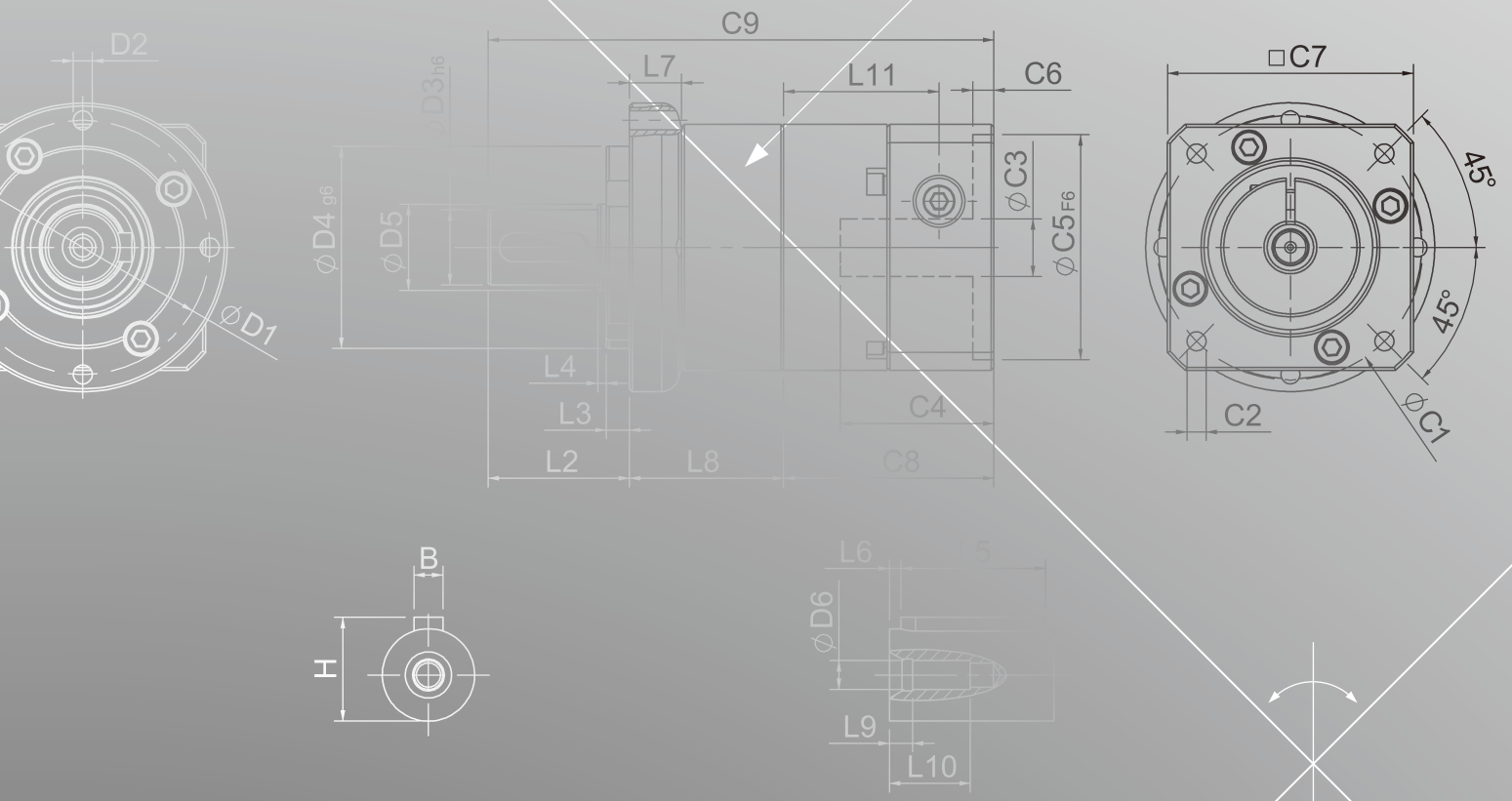
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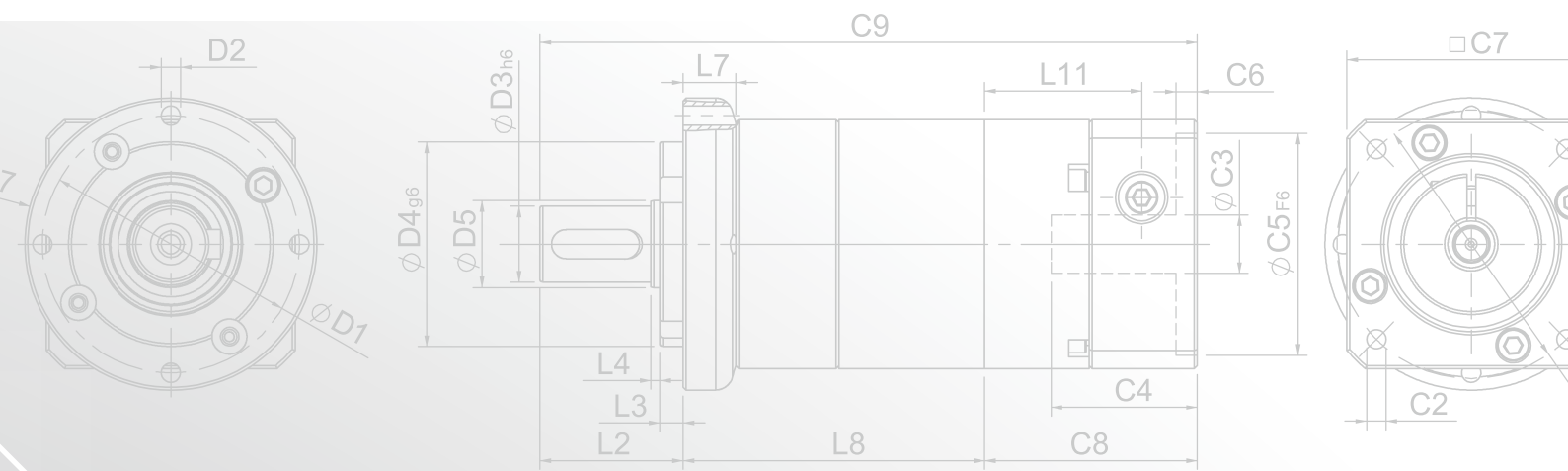
PLANETARY GEARHEADS



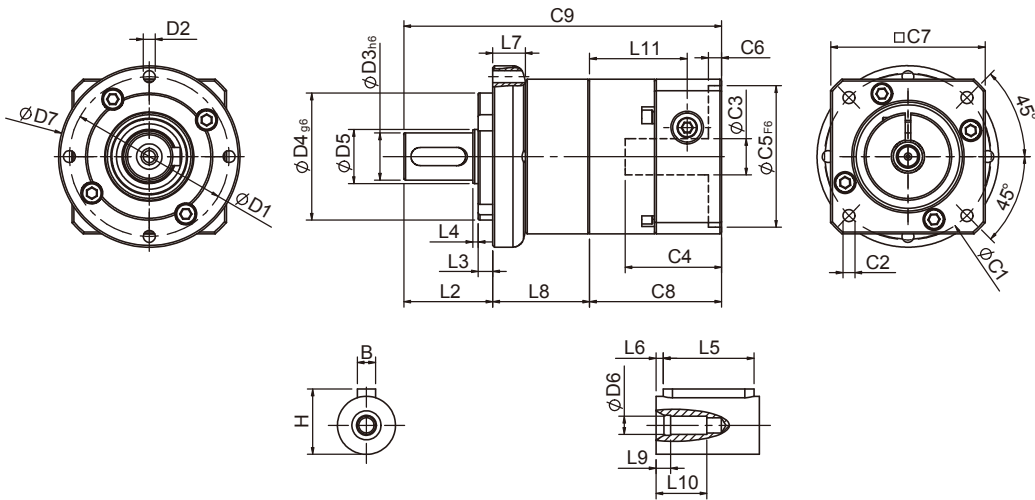
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- PHFR
- PHF
- PGH
- PUR
- PUL
- PUA
- PGLH
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- PGEH
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- PGL
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- PGE
- SGC
- SGE
- PGRH
- PGR
- PGFR
- PGF
- PBC
- PBE
- PAE**
- PAC
- PAN
- PGS
- PNS
- PGW

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 _{h6}	12	16	22	32
D4 _{g6}	35	52	68	90
D5	15	20	35	45
D6	M4x0.7P	M5x0.8P	M8x1.25P	M12x1.75P
D7	50	70	90	120
L2	24.5	36	46	60
L3	4	6	7	7
L4	1.5	1.5	2.5	2
L5	15	25	32	40
L6	2	2	3	5
L7	8.8	13.3	14	15
L8	26.5	37.3	43.8	65.3
L9	4	4	4.5	6
L10	14	16.5	20.5	30
L11	26.9	34.3	41.5	51.5
C1 ²	46	70	90	145
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P
C3 ²	$\leq 8 / \leq 11$	$\leq 14 / \leq 19$	$\leq 19 / \leq 24 / \leq 28$	$\leq 24 / \leq 32 / \leq 38$
C4 ²	26.5	33.5	41	51.5
C5 ² _{F6}	30	50	70	40
C6 ²	4	4	6	6
C7 ²	42.6	60	90	130
C8 ²	36.4	44.8	55.8	68
C9 ²	87.4	118.1	145.6	193.3
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	4.0	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 ²	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		PAC-50(ψ8)	PAC-70(ψ14)	PAC-90(ψ19)	PAC-120(ψ24)	
1	3	Kg · cm ²		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(ψ8)	PAC-70(ψ14)/ PAC-70T(ψ8)	PAC-90(ψ19)/ PAC-90T(ψ14)	PAC-120T (ψ19)	
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 at 100 rpm.								
* 2. Measured at 3000 rpm with no load. These values are measured by gearbox with ratio = 10 (1-stage) or ratio = 100 (2-stage) at nominal input speed or 3000 rpm (if nominal input speed is higher than 3000 rpm) with no load.								
※ The above figures/specifications are subject to change without prior notice.								

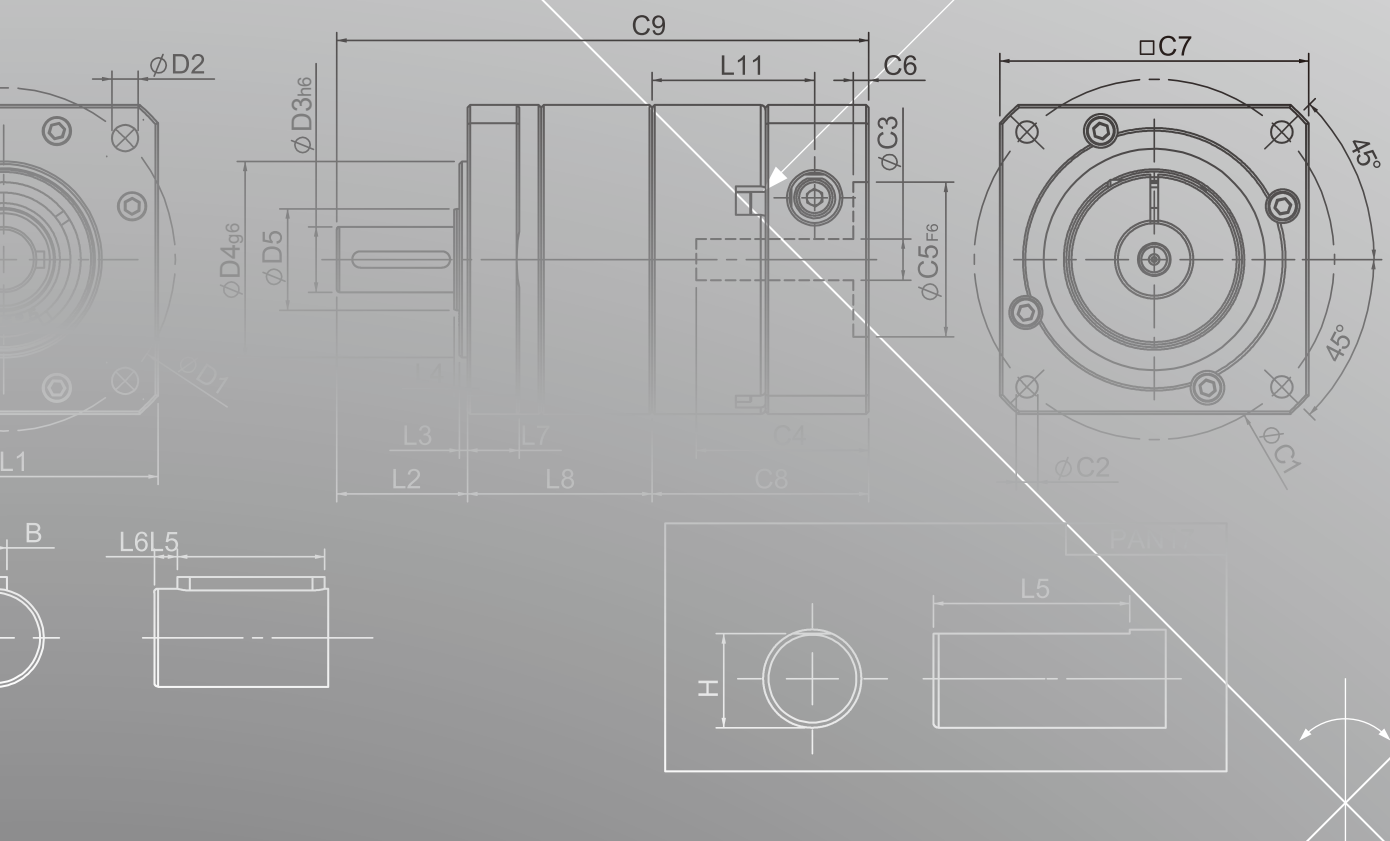
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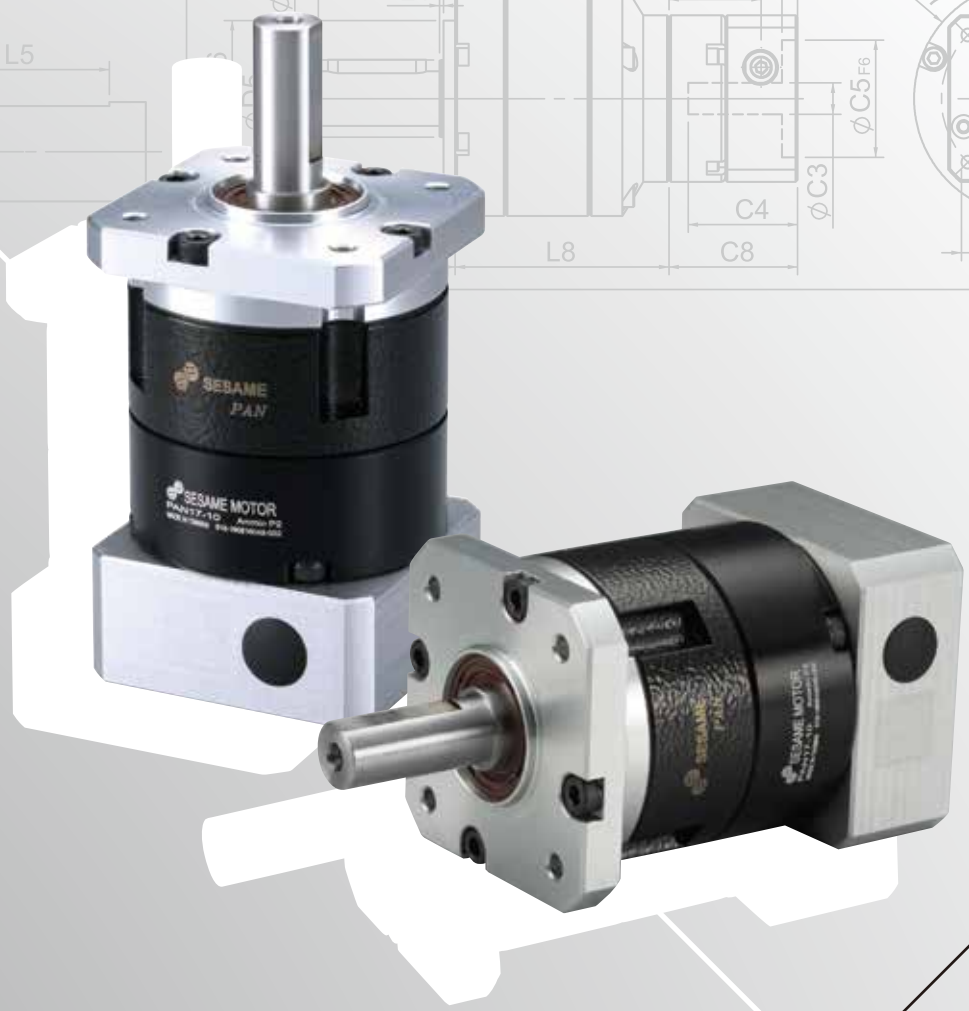
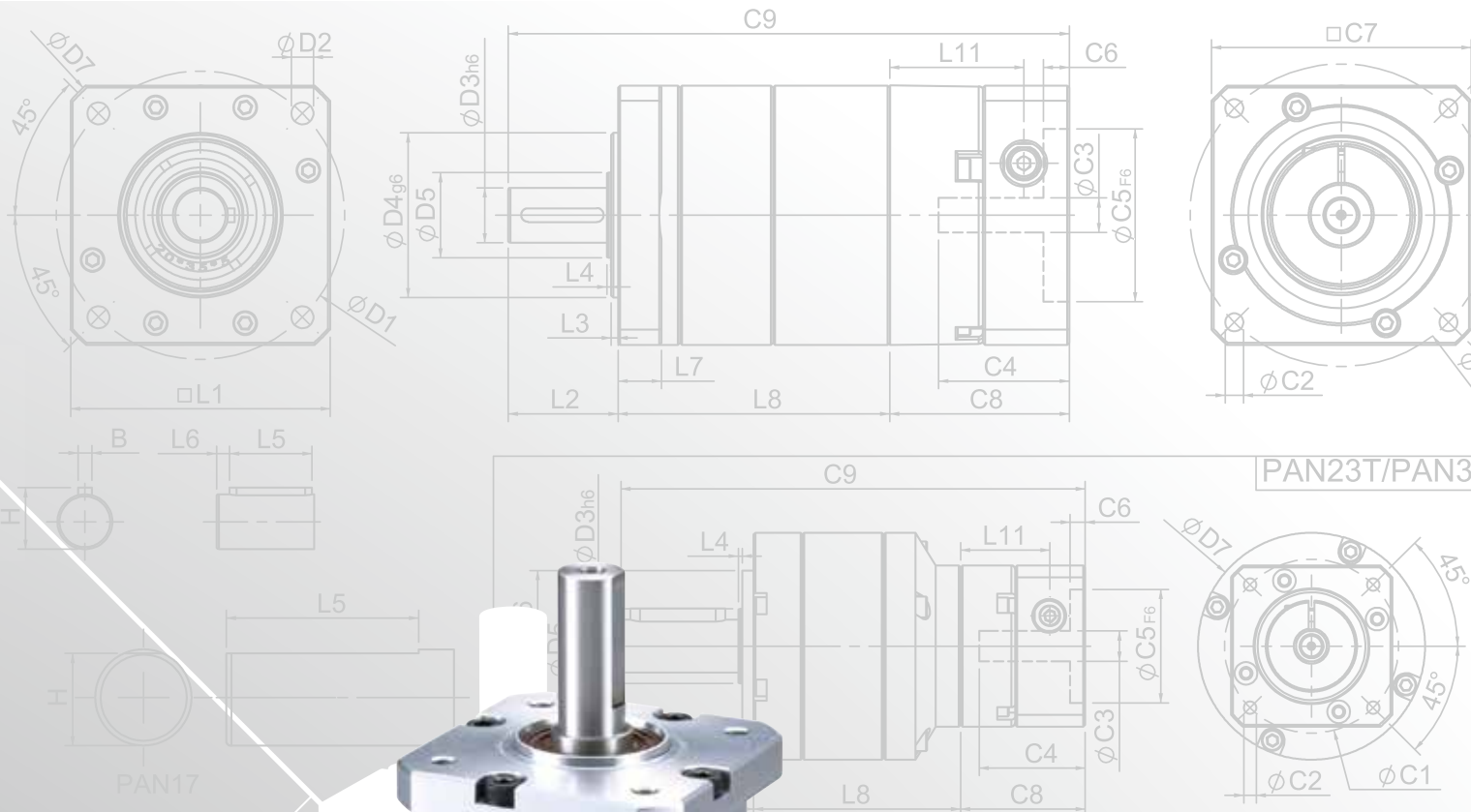
PLANETARY GEARHEADS



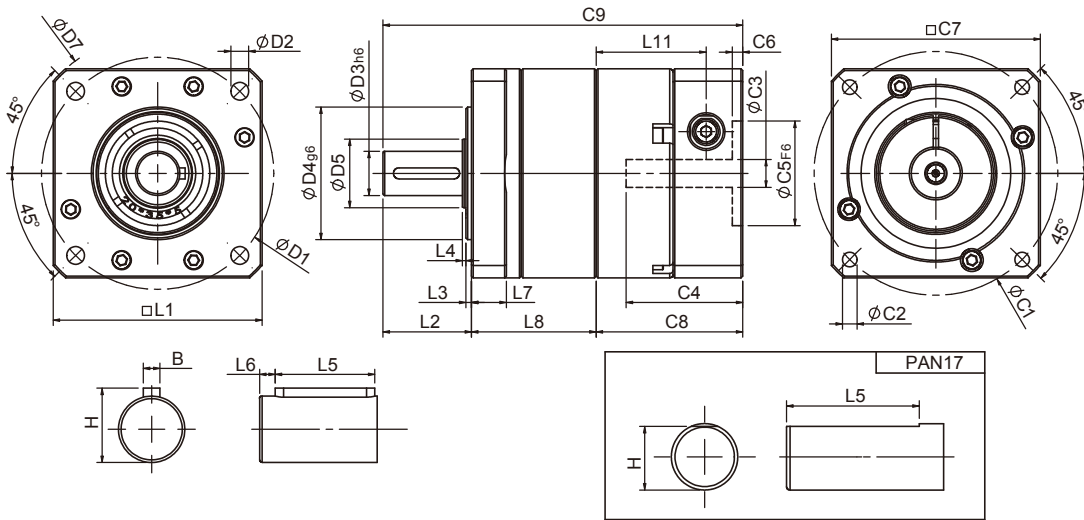
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PAN SERIES





PAN Single Stage Dimensions



Specifications

Unit:mm

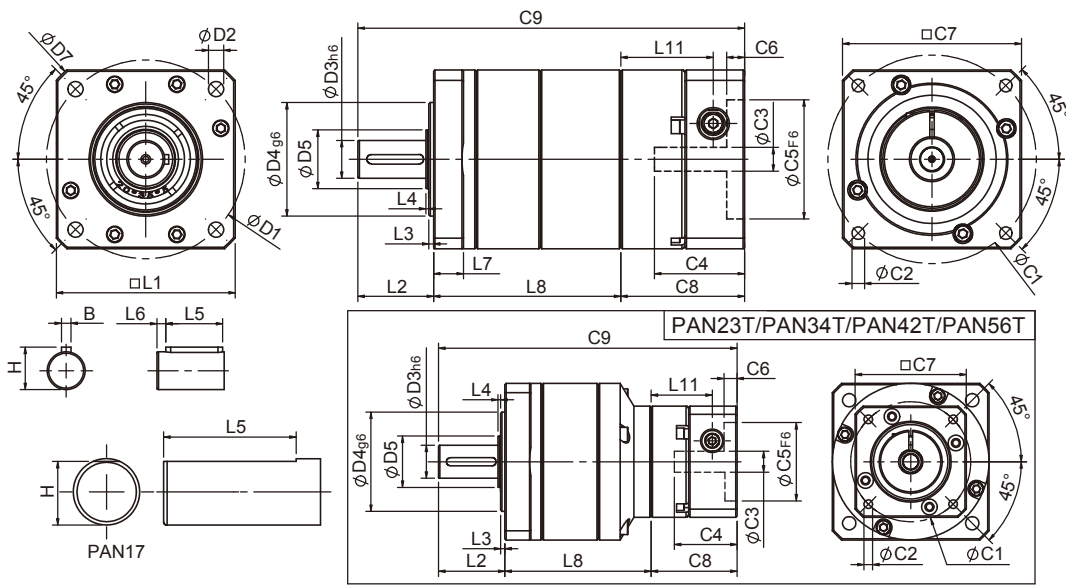
Dimensions	PAN17	PAN23	PAN34	PAN42	PAN56
D1	43.8	66.67	98.425	125.73	177.8
D2	3.25	5.1	5.6	7.1	10.2
D3 _{h6}	9.525	12.7	19.05	25	25
D4 _{g6}	21.97	38.1	73.025	55.55	114.3
D5	12	20	35	32	-
D7	56	80	118	148	195
L1	42.6(44)	60	90	115	145
L2	25.4	25.4	31.75	42	41
L3	1.6	1.6	1.7	2.4	4
L4	1	1	1	2	-
L5	19.05	19.05	25.4	32	32
L6	-	3	3	4	4
L7	6.5	10	12	19	20
L8	28.8	35.8	43.5	67.4	68.4
L11	26.9	31.6	37.3	51.8	51.8
C1 ²	46	70	90	145	145
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P
C3 ²	≤8/≤11	≤14/≤19	≤19/≤24/≤28	≤24/≤32/≤38	≤24/≤32/≤38
C4 ²	26.5	33.5	41	51.5	51.5
C5 ² _{F6}	30	50	70	110	110
C6 ²	4	4	6	6	6
C7 ²	42.6	60	90	130	130
C8 ²	36.4	42.1	51.5	68	68
C9 ²	90.6	103.3	126.75	177.4	177.4
B	-	3.175	4.763	8	8
H	9.14	14.1	21.1	28	28

★ L1=44 when gear ratio is 10.

★ 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

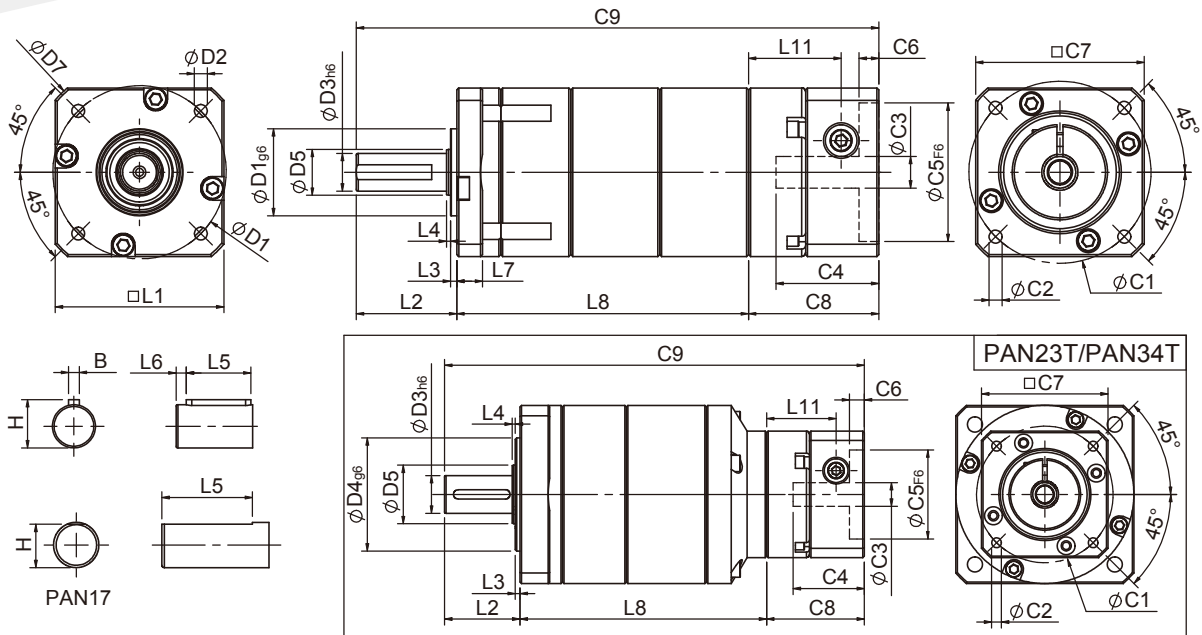
Dimensions	PAN17	PAN23	PAN23T	PAN34	PAN34T	PAN42T	PAN56T
D1	43.8	66.67		98.425		125.73	177.8
D2	3.25	5.1		5.6		7.1	10.2
D3 _{h6}	9.525	12.7		19.05		25	25
D4 _{g6}	21.97	38.1		73.025		55.55	114.3
D5	12	20		35		32	-
D7	56	80		118		148	195
L1	42.6(44)	60		90		115	145
L2	25.4	25.4		31.75		42	41
L3	1.6	1.6		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	37.3	31	37.3	37.3
C1 ²	46	70	46	90	70	90	90
C2 ²	M4x0.7P	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P	M6x1.0P	M6x1.0P
C3 ²	≤8/≤11	≤14/≤19	≤8/≤11	≤19/≤24/≤28	≤14/≤19	≤19/≤24/≤28	≤19/≤24/≤28
C4 ²	26.5	33.5	26.5	41	33.5	41	41
C5 ² _{F6}	30	50	30	70	50	70	70
C6 ²	4	4	4	6	4	6	6
C7 ²	42.6	60	42.6	90	60	90	90
C8 ²	32.9	41.5	32.9	51.5	41.5	51.5	51.5
C9 ²	109.55	129.7	114.4	160.55	146.05	199	199
B	-	3.175		4.763		8	8
H	9.14	14.1		21.1		28	28

★ L1=44 when gear ratio is 100.

★ 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 _{h6}	9.525	12.7	19.05
D4 _{g6}	21.97	38.1	73.025
D5	12	20	35
D7	56	80	118
L1	42.6(44)	60	90
L2	25.4	25.4	31.75
L3	1.6	1.6	1.7
L4	1	1	1
L5	19.05	19.05	25.4
L6	-	3	3
L7	6.5	10	12
L8	73.7	83.1	106.6
L11	23.4	23.4	31
C1 ²	46	46	70
C2 ²	M4x0.7P	M4x0.7P	M5x0.8P
C3 ²	≤8/≤11	≤8/≤11	≤14/≤19
C4 ²	26.5	26.5	33.5
C5 ² _{F6}	30	30	50
C6 ²	4	4	4
C7 ²	42.6	42.6	60
C8 ²	32.9	32.9	41.5
C9 ²	132	141.4	179.85
B	-	3.175	4.763
H	9.14	14.1	21.1

★ L1=44 when gear ratio is 1000.

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

★ Specification subject to change without notice.

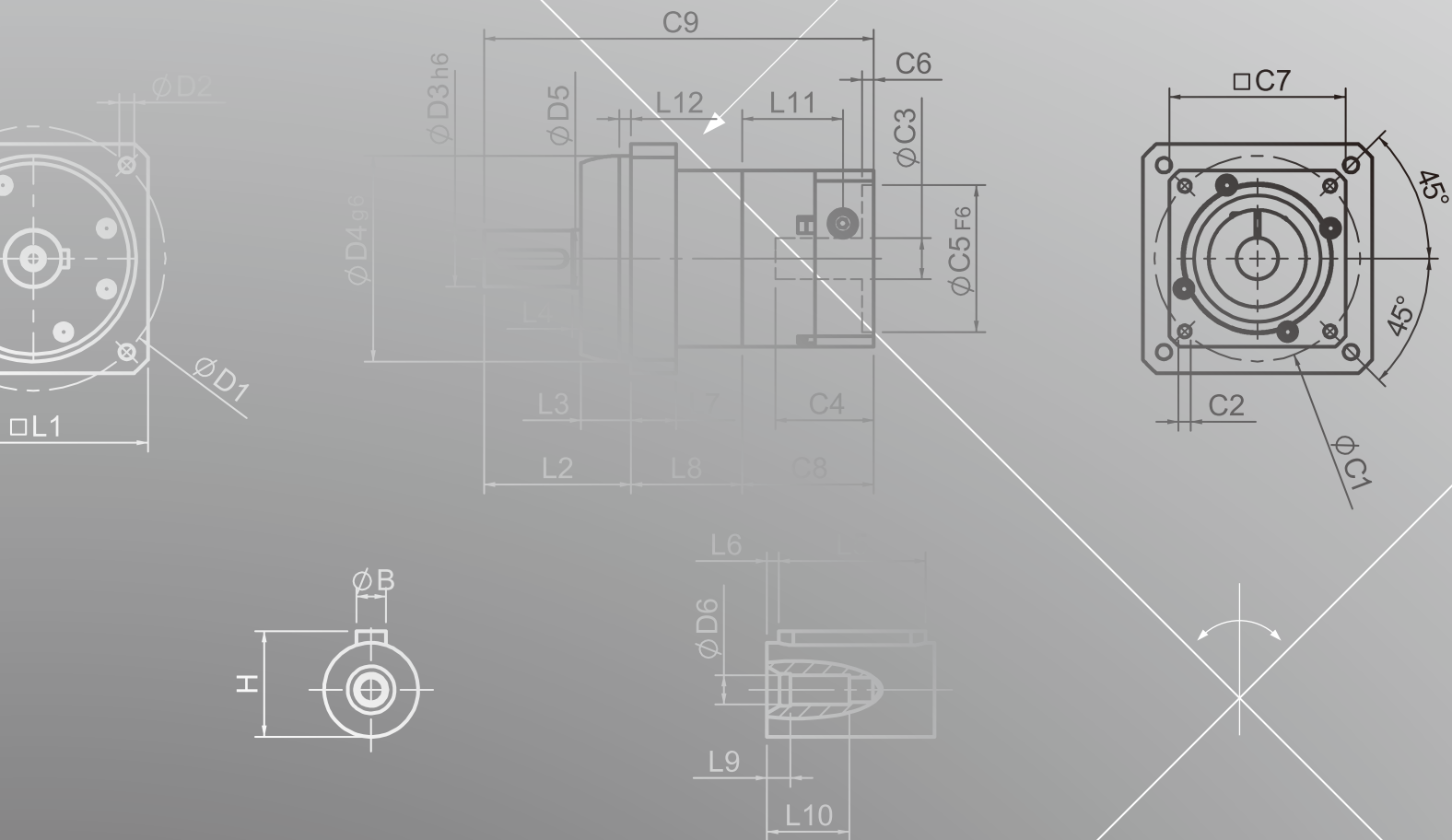
PAN Specifications Table

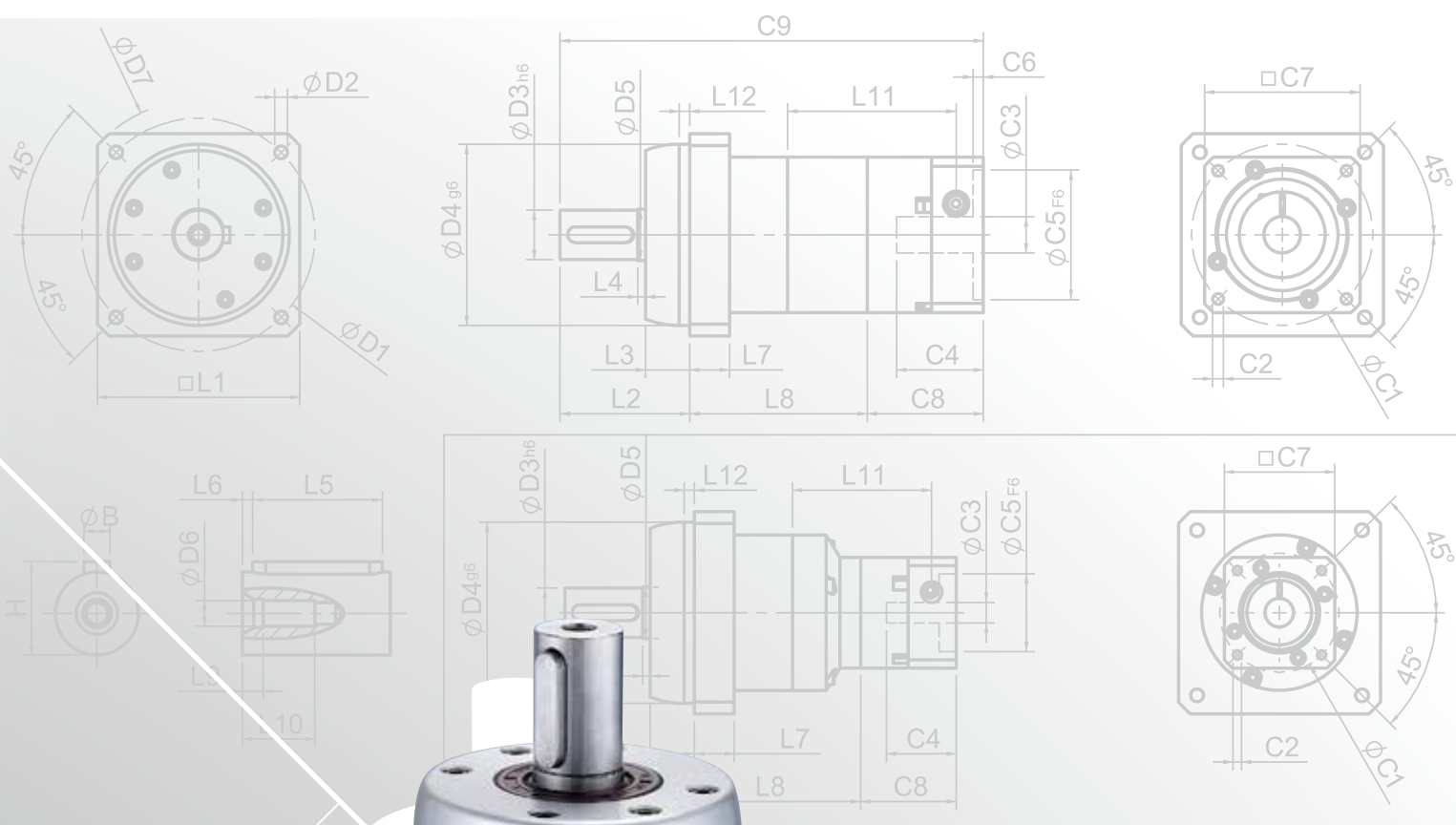
Specifications		Stage	Ratio	PAN-17	PAN-23	PAN-34	PAN-42	PAN-56		
Nominal Output Torque T_{2N}	N • m	1	3	9	28	85	200	200		
			4	10	32	80	215	215		
			5	11	35	95	215	215		
			7	10	28	85	200	200		
			9	8	23	75	195	195		
		10	8	21	65	180	180			
		Stage	Ratio	PAN-17	PAN-23 / PAN-23T	PAN-34 / PAN-34T	PAN-42T	PAN-56T		
		2	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			
		Stage	Ratio	PAN-17	PAN-23T	PAN-34T	PAN-42T	PAN-56T		
		3	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 P2	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 ²	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 ²	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 at 100 rpm.
* 2. Measured at 3000 rpm with no load. These values are measured by gearbox with ratio = 10 (1-stage) or ratio = 100 (2-stage) at nominal input speed or 3000 rpm (if nominal input speed is higher than 3000 rpm) with no load.
※ The above figures/specifications are subject to change without prior notice.

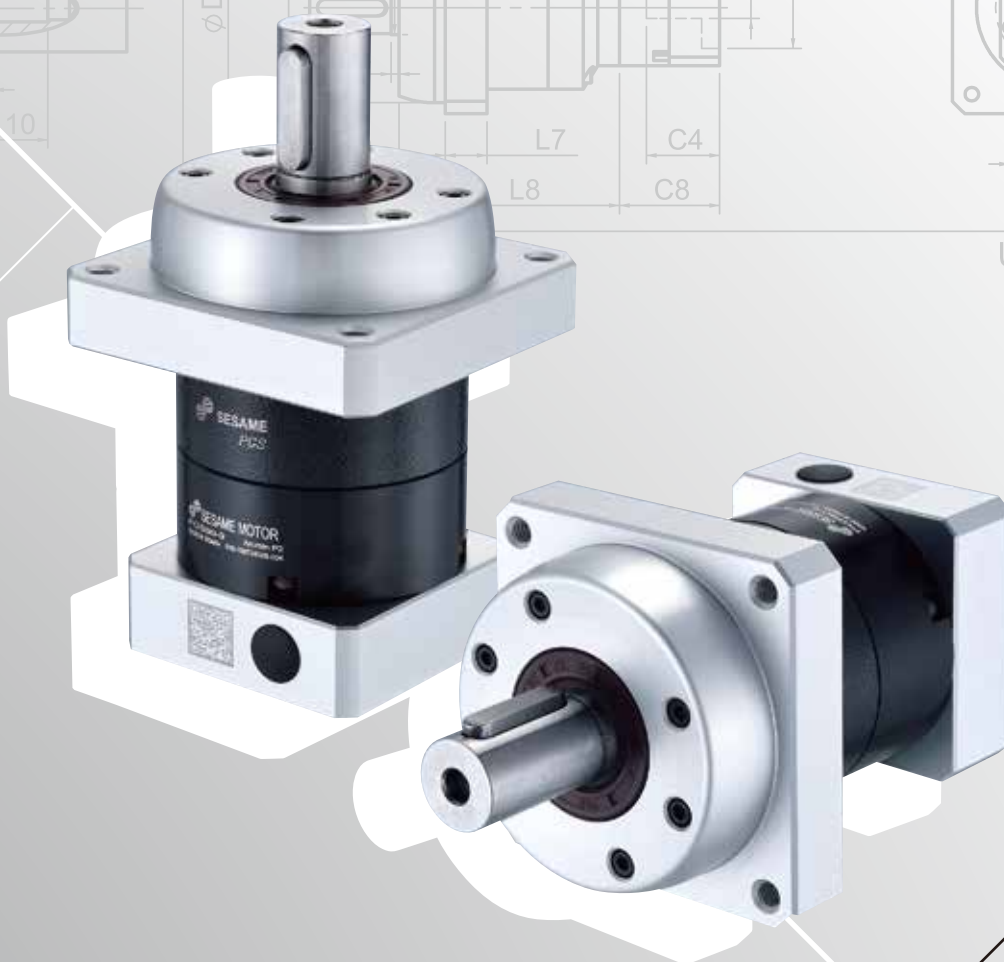
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PGS SERIES

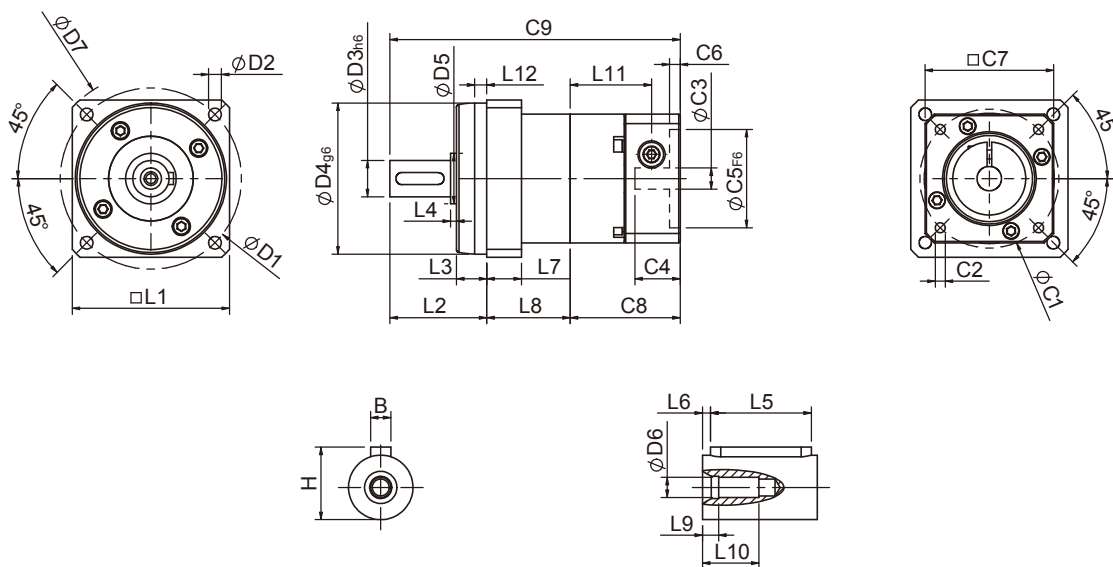




Unit:mm



PGS Single Stage Dimensions



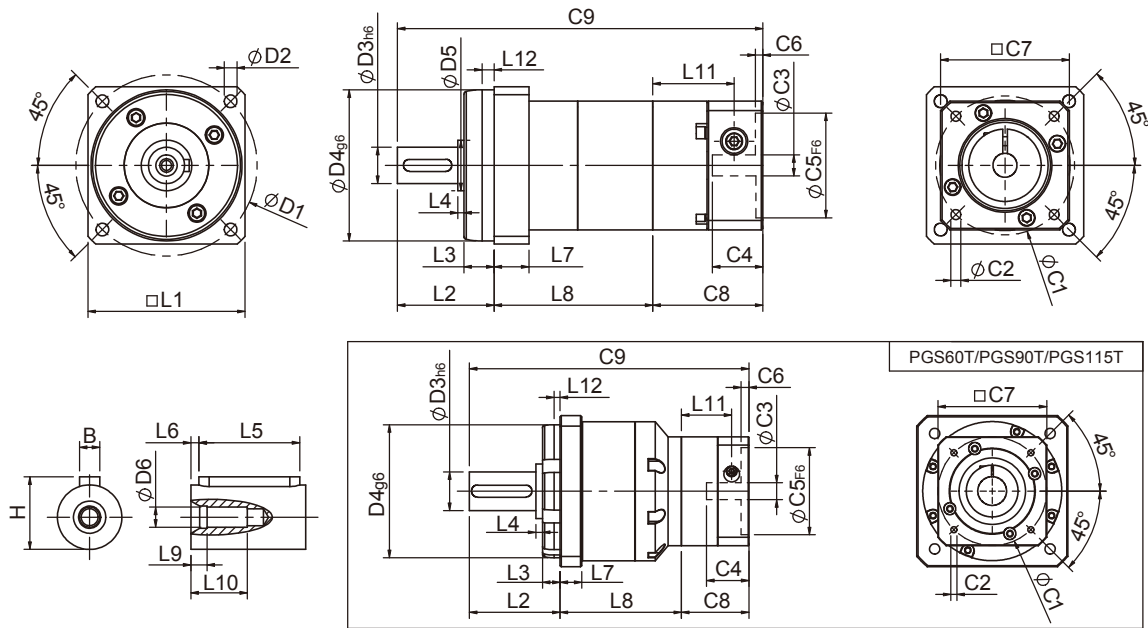
Specifications

Unit:mm

Dimensions	PGS42	PGS60	PGS90	PGS115
D1	60	90	115	135
D2	M5x0.8P	M6x1.0P	M8x1.25P	M10x1.5P
D3 _{h6}	12	19	24	32
D4 _{g6}	50	70	90	110
D5	17	20	30	45
D6	M4x0.7P	M6x1.0P	M8x1.25P	M12x1.75P
D7	70	104	132	165
L1	52	78	98	125
L2	32	50	61	75
L3	10	17	18	14.5
L4	2	3	1.5	5.5
L5	16	25	32	40
L6	2	3	3	5
L7	11.5	15.4	18	18
L8	27.6	37.8	46.2	62.3
L9	4	4	4.5	6
L10	14	16.5	20.5	30
L11	26.9	34.3	41.55	51.5
L12	3	4	5	5
C1 ²	46	70	90	145
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P
C3 ²	$\leq 8 / \leq 11$	$\leq 14 / \leq 19$	$\leq 19 / \leq 24 / \leq 28$	$\leq 24 / \leq 32 / \leq 38$
C4 ²	26.5	33.5	41	51.5
C5 ² _{F6}	30	50	70	110
C6 ²	4	4	6	6
C7 ²	42.6	60	90	130
C8 ²	36.4	44.8	55.8	68
C9 ²	96	132.6	163	205.3
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 _{h6}	12	19		24		32
D4 _{g6}	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	76.7	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 ²	46	70	46	90	70	90
C2 ²	M4x0.7P	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P	M6x1.0P
C3 ²	≤8/≤11	≤14/≤19	≤8/≤11	≤19/≤24/≤28	≤14/≤19	≤19/≤24/≤28
C4 ²	26.5	33.5	26.5	41	33.5	41
C5 ² _{F6}	30	50	30	70	50	70
C6 ²	4	4	4	6	4	6
C7 ²	42.6	60	42.6	90	60	90
C8 ²	36.4	44.8	36.4	55.8	44.8	55.8
C9 ²	120.9	163.3	-	204	182.5	231.2
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	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	PGS-42	PGS-60/ PGS-60T	PGS-90/ PGS-90T	PGS-115T
		2	15	11	34	90	230
			20	10	32	80	240
			25	11	35	95	260
			35	11	35	95	260
			45	11	35	95	260
			49	10	28	85	260
			63	10	28	85	220
81	8		23	75	210		
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	4.0	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	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	1.5	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 ²	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(ψ8)	PGS-60(ψ14)	PGS-90(ψ19)	PGS-115(ψ24)
1	3	Kg • cm ²		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			PGS-42(ψ8)	PGS-60(ψ14)/ PGS-60T(ψ8)	PGS-90(ψ19)/ PGS-90T(ψ14)	PGS-115T(ψ19)
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
	45/63/81/100			0.03	0.21(0.03)	0.60(0.21)	0.60
* 1. Applied to the output shaft center at 100 rpm.							
* 2. Measured at 3000 rpm with no load. These values are measured by gearbox with ratio = 10 (1-stage) or ratio = 100 (2-stage) at nominal input speed or 3000 rpm (if nominal input speed is higher than 3000 rpm) with no load.							
※ The above figures/specifications are subject to change without prior notice.							

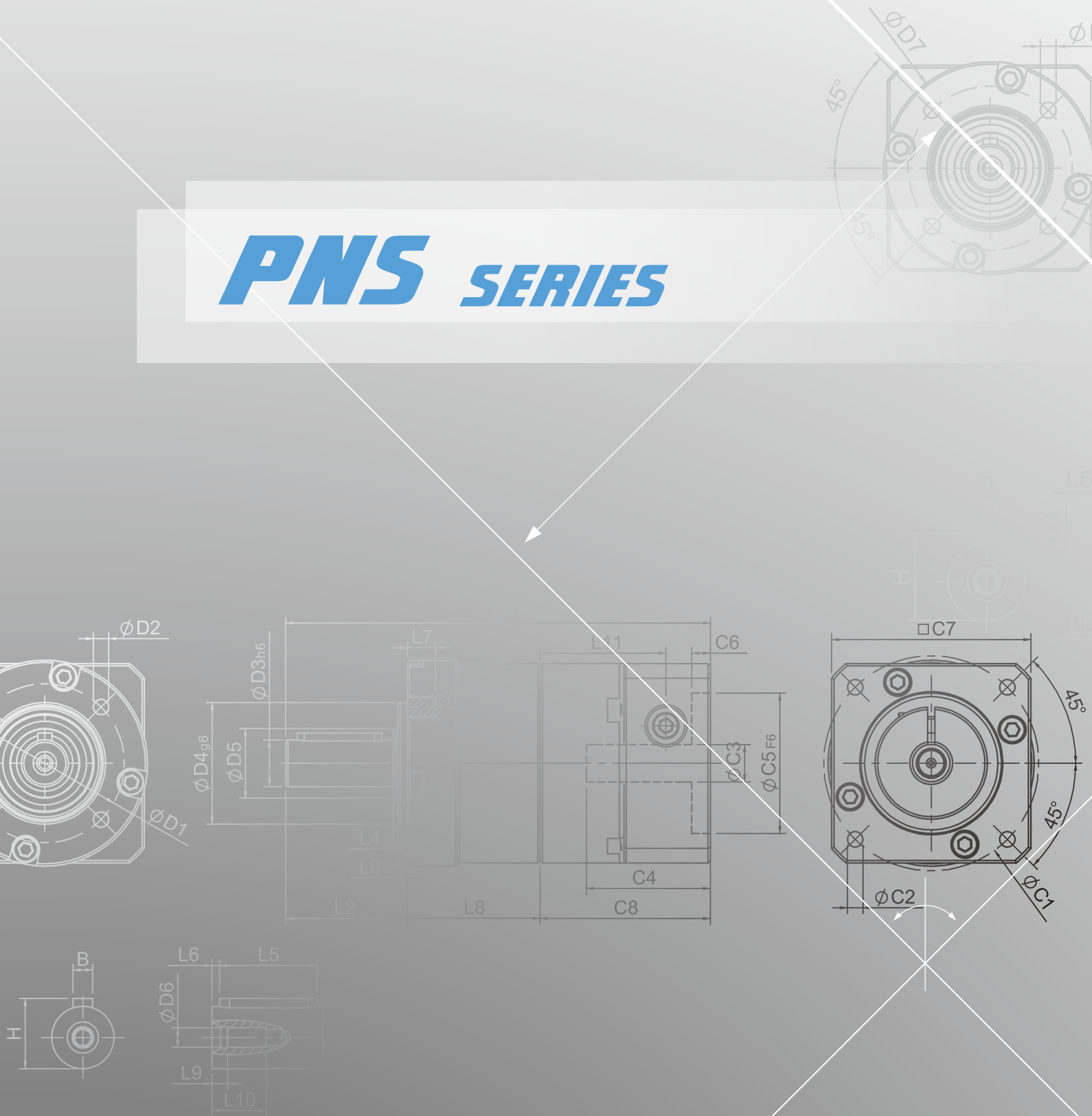
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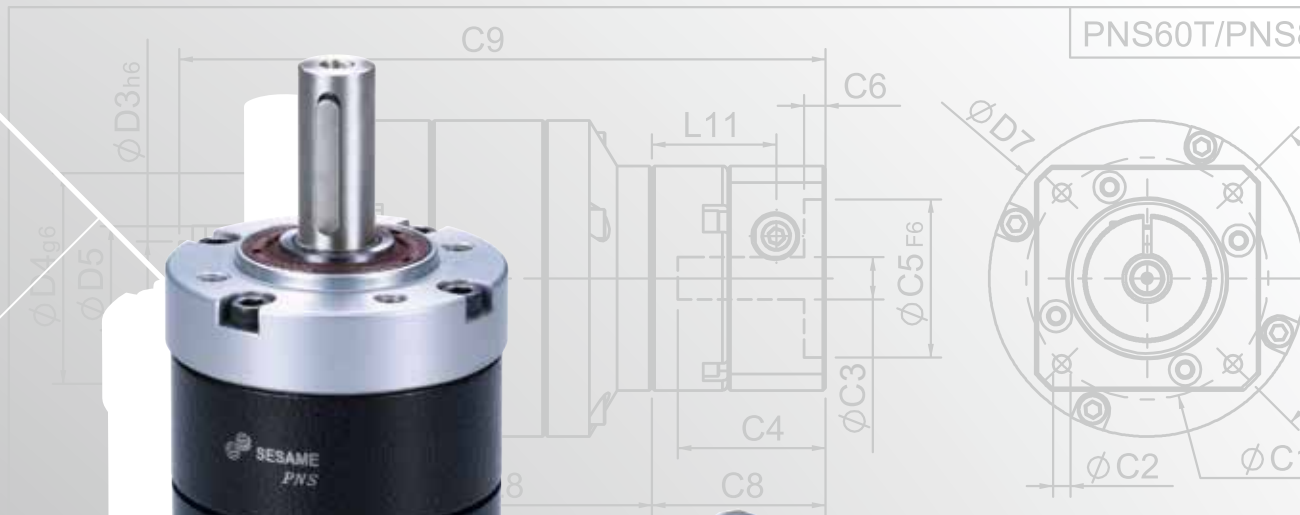
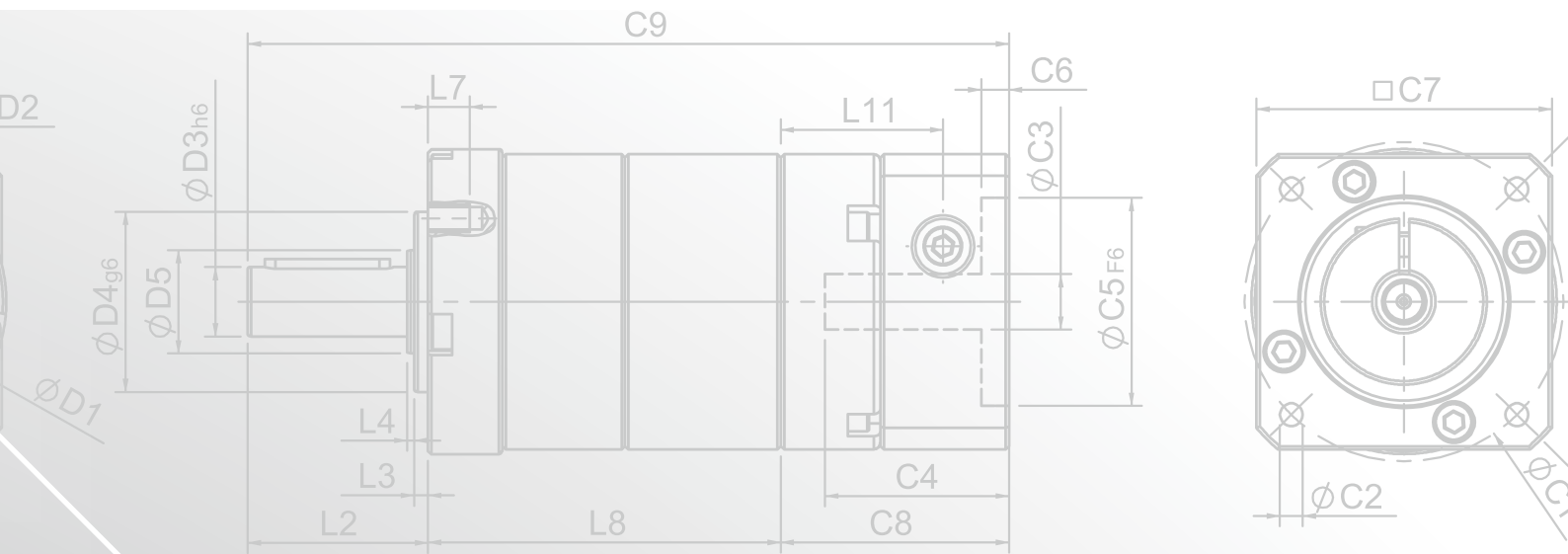
PLANETARY GEARHEADS



PHL | PHFR | PHF | PGH | PUR | PUL | PUA | PGLH | PGCH | PGEH | PGSH | PGL | PGC | PGE | SGC | SGE | PGRH | PGR | PGRF | PGF | PBC | PBE | PAE | PAC | PAN | PGS | PNS | PGW

PNS SERIES

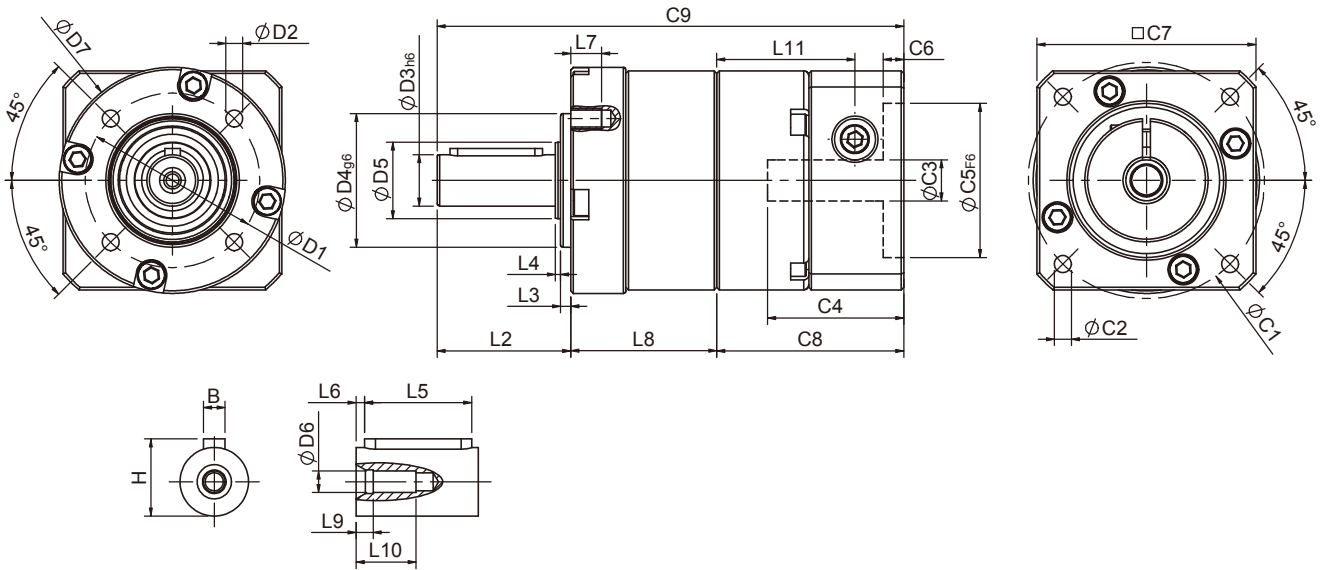




PNS60T/PNS



PNS Single Stage Dimensions



Specifications

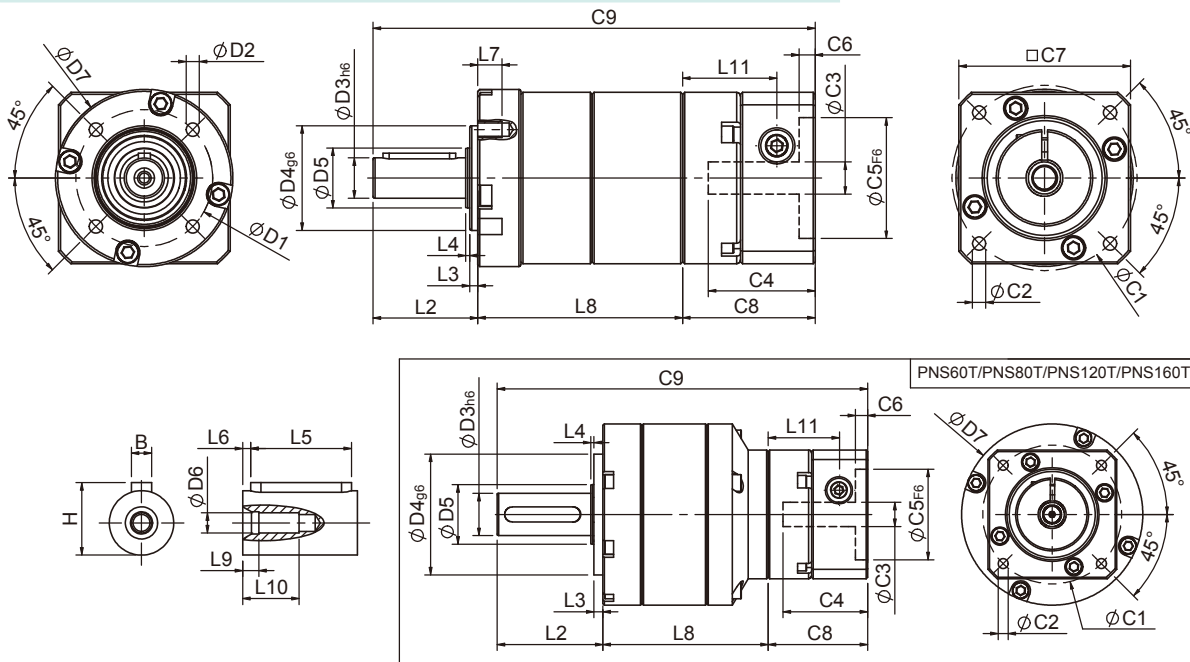
Unit:mm

Dimensions	PNS40	PNS60	PNS80	PNS120	PNS160
D1	34	52	70	100	145
D2	M4x0.7P	M5x0.8P	M6x1.0P	M10x1.5P	M12x1.75P
D3 _{h6}	10	14	20	25	40
D4 _{g6}	26	40	60	80	130
D5	15	20	35	40	50
D6	M3x0.5P	M5x0.8P	M6x1.0P	M10x1.5P	M16x2.0P
D7	44	60	90	116	160
L2	26	35	40	55	87
L3	2	3	3	4	5
L4	1	1	1	1	2
L5	18	25	28	40	65
L6	2.5	2.5	4	5	8
L7	6	8	10	15	20
L8	28.4	34.4	42.2	68.8	81
L9	3	4	4.5	6	6
L10	9	16.5	16.5	26	38
L11	26.9	31.6	37.3	51.8	63
C1 ²	46	70	90	145	130
C2 ²	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P
C3 ²	≤8/≤11	≤14/≤19	≤19/≤24/≤28	≤24/≤32/≤38	≤35/≤38
C4 ²	26.5	33.5	41	51.5	66.5
C5 ² _{f6}	30	50	70	110	110
C6 ²	4	4	6	6	5.5
C7 ²	42.6	60	90	130	140
C8 ²	36.4	42.1	51.5	68	80
C9 ²	90.8	111.5	133.7	191.8	248
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

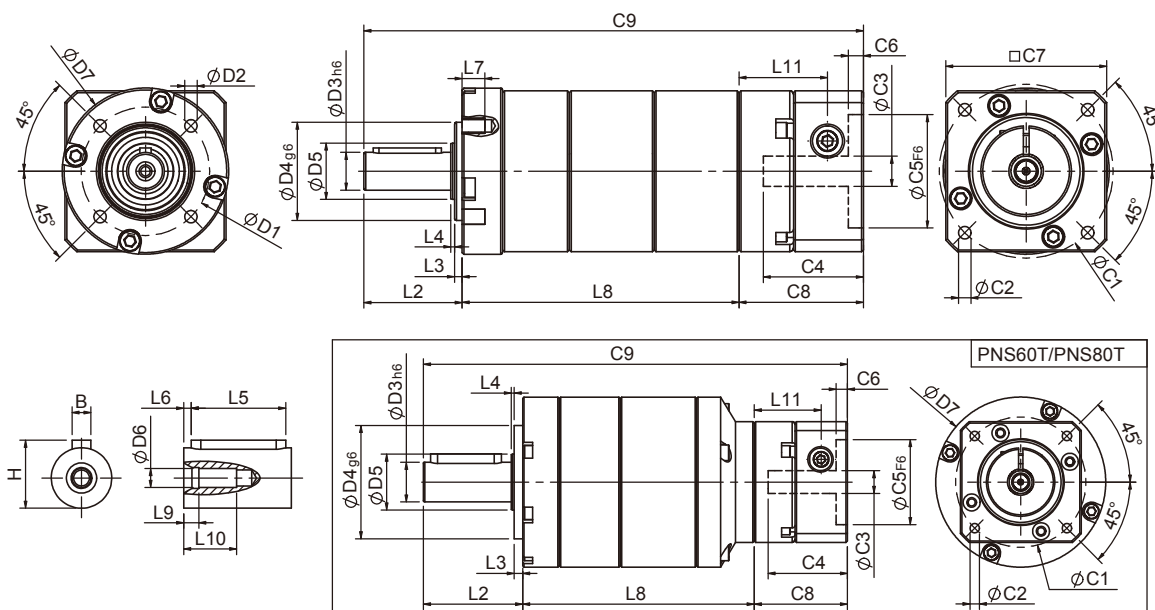
Unit:mm

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 _{h6}	10	14		20		25	40	
D4 _{g6}	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	50.85	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 ²	46	70	46	90	70	90	130	115
C2 ²	M4x0.7P	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P
C3 ²	≤8/≤11	≤14/≤19	≤8/≤11	≤19/≤24/≤28	≤14/≤19	≤19/≤24/≤28	≤35/≤38	≤24/≤28
C4 ²	26.5	33.5	26.5	41	33.5	41	66.5	53.5
C5 ² _{F6}	30	50	30	70	50	70	110	95
C6 ²	4	4	4	6	4	6	5.5	5.5
C7 ²	42.6	60	42.6	90	60	90	140	120
C8 ²	32.9	41.5	32.9	51.5	41.5	51.5	80	58
C9 ²	109.75	137.9	122.6	167.5	153	213.4	309	274
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-1



Specifications

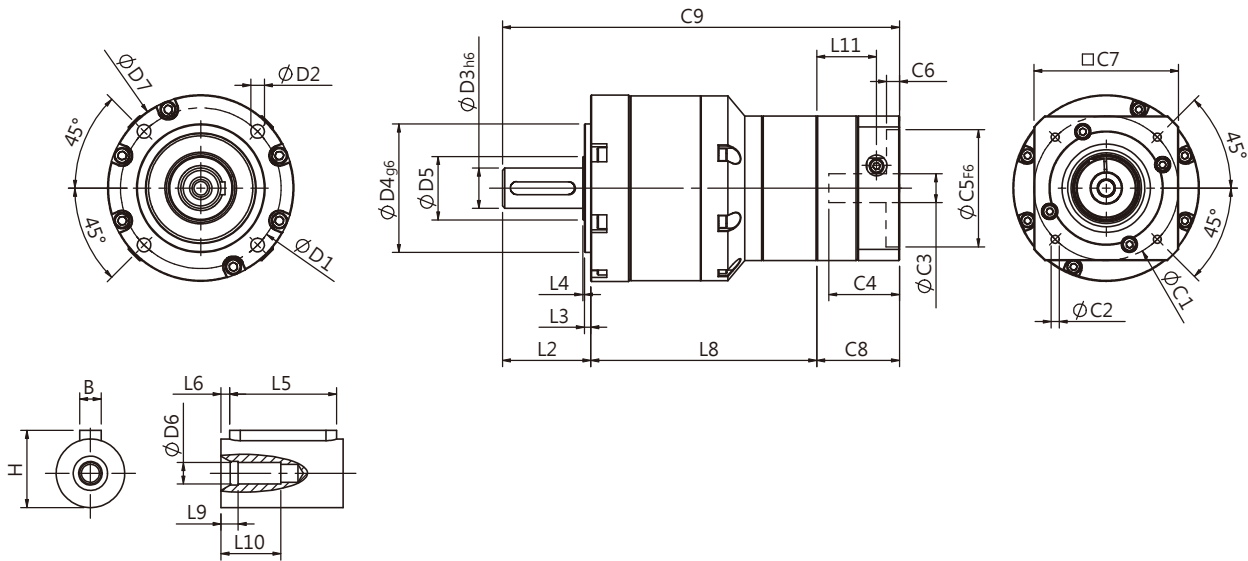
Unit:mm

Dimensions	PNS40	PNS60T	PNS80T
D1	34	52	70
D2	M4x0.7P	M5x0.8P	M6x1.0P
D3 _{h6}	10	14	20
D4 _{g6}	26	40	60
D5	15	20	35
D6	M3x0.5P	M5x0.8P	M6x1.0P
D7	44	60	90
L2	26	35	40
L3	2	3	3
L4	1	1	1
L5	18	25	28
L6	2.5	2.5	4
L7	6	8	10
L8	73.3	81.7	105.3
L9	3	4	4.5
L10	9	16.5	16.5
L11	23.4	23.4	31
C1 ²	46	46	70
C2 ²	M4x0.7P	M4x0.7P	M5x0.8P
C3 ²	≤8/≤11	≤8/≤11	≤14/≤19
C4 ²	26.5	26.5	33.5
C5 ² _{F6}	30	30	50
C6 ²	4	4	4
C7 ²	42.6	42.6	60
C8 ²	32.9	32.9	41.5
C9 ²	132.2	149.6	186.8
B	3	5	6
H	11.2	16	22.5

★ 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-2



Specifications

Unit:mm

Dimensions	PNS120T	PNS160T
D1	100	145
D2	M10x1.5P	M12x1.75P
D3 _{h6}	25	40
D4 _{g6}	80	130
D5	40	50
D6	M10x1.5P	M16x2.0P
D7	116	160
L2	55	87
L3	4	5
L4	1	2
L5	40	65
L6	5	8
L7	15	20
L8	140.7	177
L9	6	6
L10	26	38
L11	37.3	42
C1 ²	90	115
C2 ²	M6x1.0P	M8x1.25P
C3 ²	$\leq 19 / \leq 24 / \leq 28$	$24 / \leq 28$
C4 ²	41	53.5
C5 ² _{F6}	70	95
C6 ²	6	5.5
C7 ²	90	120
C8 ²	51.5	58
C9 ²	247.2	322
B	8	12
H	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 Specifications Table

Specifications		Stage	Ratio	PNS-40	PNS-60	PNS-80	PNS-120	PNS-160		
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	PNS-160/ PNS-160T		
		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	PNS-160T		
		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	22.4		
Mounting Position	-	1,2,3	3-1000	Any direction						
Noise Level ²	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 ²	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 at 100 rpm.										
* 2. Measured at 3000 rpm with no load. These values are measured by gearbox with ratio = 10 (1-stage) or ratio = 100 (2-stage) at nominal input speed or 3000 rpm (if nominal input speed is higher than 3000 rpm) with no load.										
※ The above figures/specifications are subject to change without prior notice.										

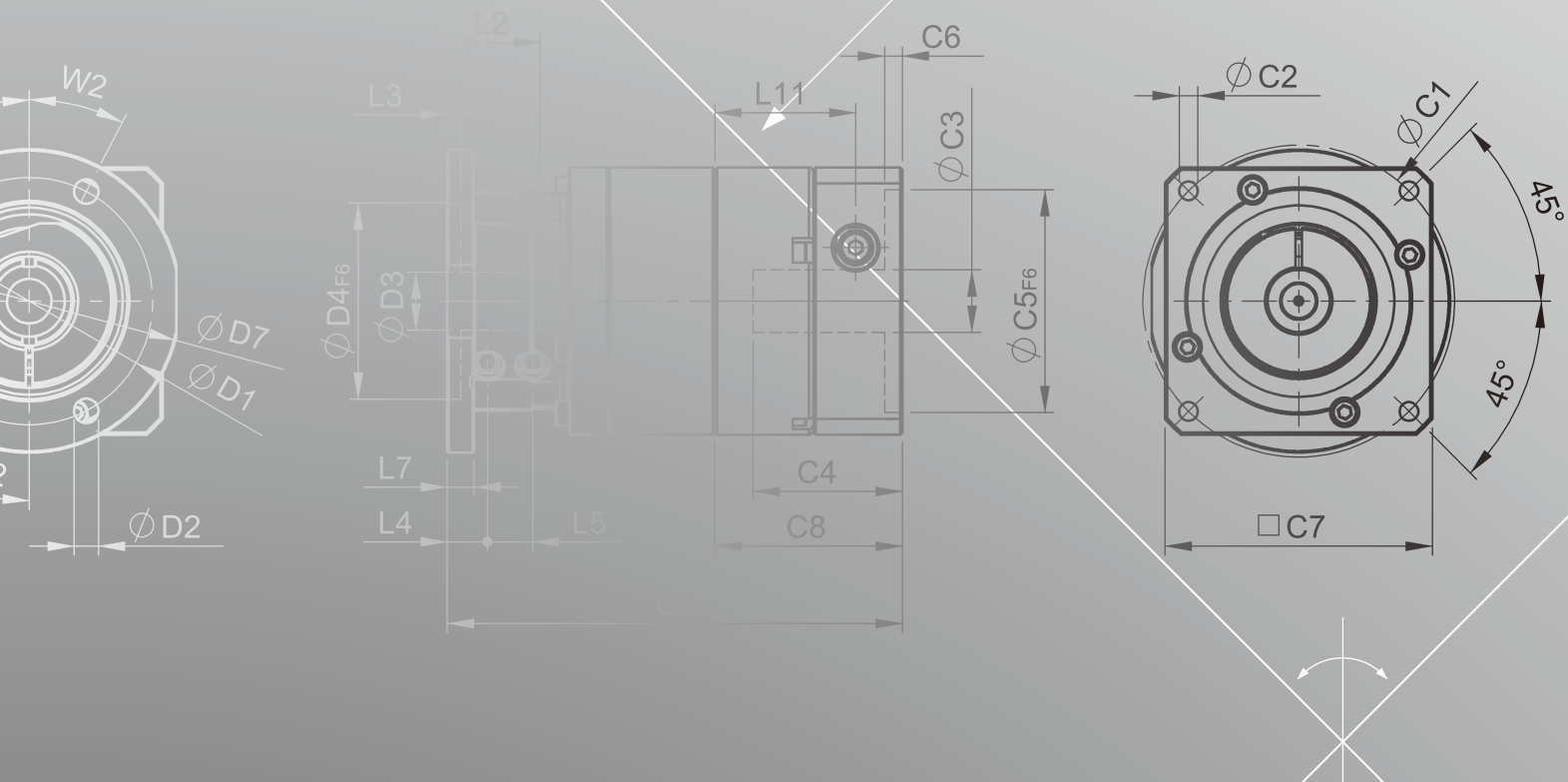
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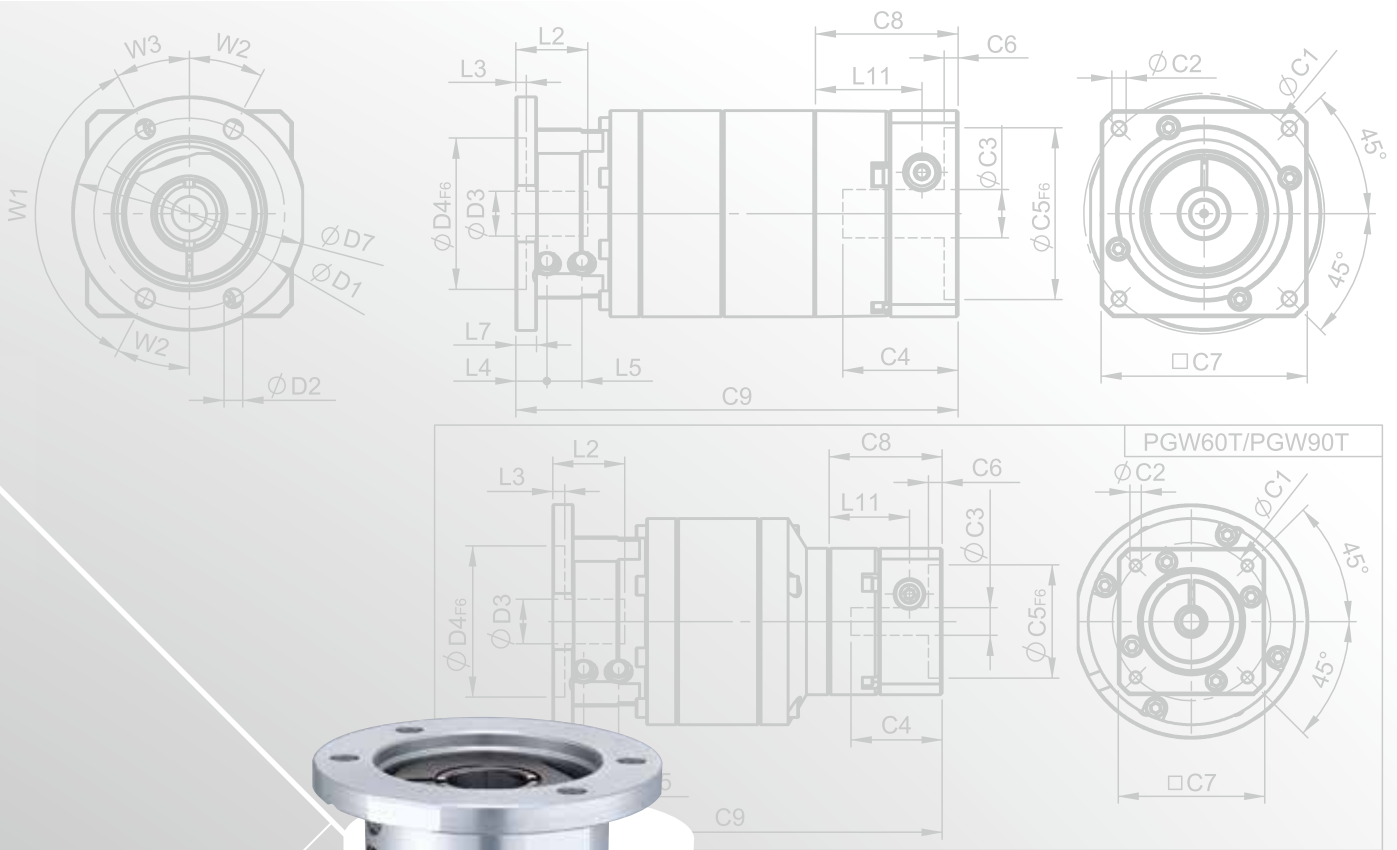
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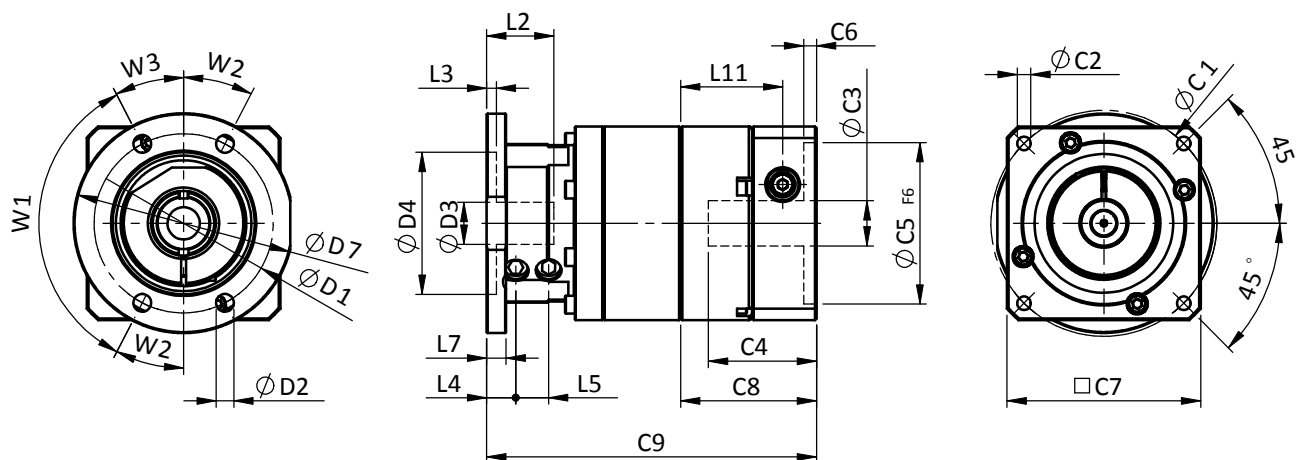
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PGW SERIES





PGW Single Stage Dimensions



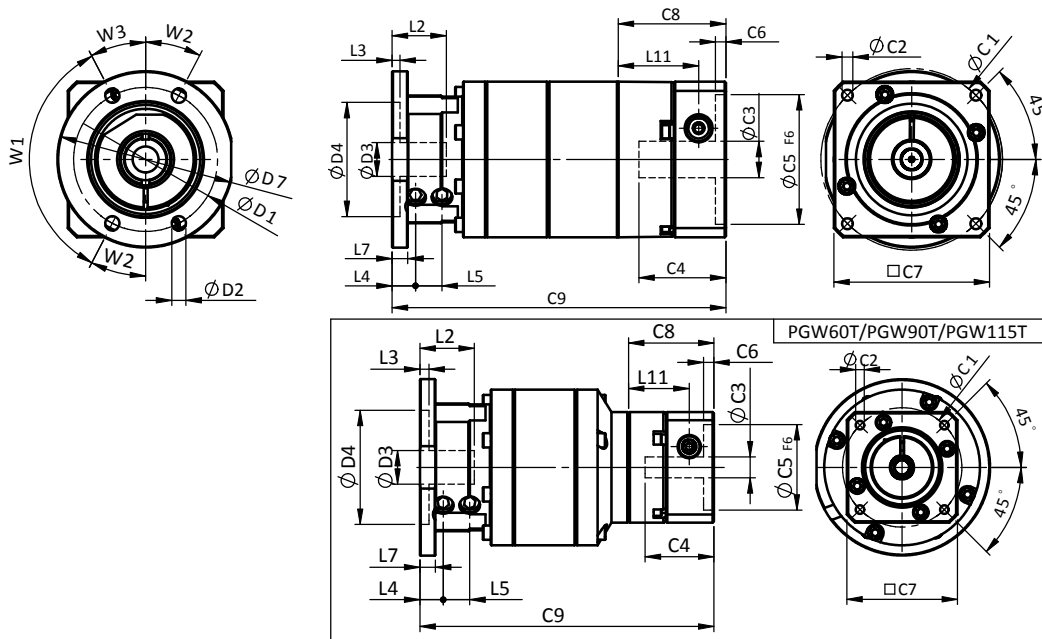
Specifications

Unit:mm

Dimensions	PGW60	PGW90	PGW115
D1	55.5	73	105
D2	5.5	5.5	6.6
D3	16	20	30
D4	44	60	80
D7	70	84	118
L2	31	31	37
L3	3.5	3.5	3.5
L4	9	10.2	12.5
L5	10.2	10.9	13
L7	6	6	10
L11	31.6	37.3	51.8
W1	125°	90°	90°
W2	27.5°	22.5°	22.5°
W3	27.5°	67.5°	67.5°
C1 ²	70	90	145
C2 ²	M5x0.8P	M6x1.0P	M8x1.25P
C3 ²	≤14/≤19	≤19/≤24/≤28	≤24/≤32/≤38
C4 ²	33.5	41	51.5
C5 ² F6	50	70	110
C6 ²	4	6	6
C7 ²	60	90	130
C8 ²	42.1	51.5	68
C9 ²	102.2	126.5	172

★ 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	PGW115T
D1	55.5		73		105
D2	5.5		5.5		6.6
D3 _{h6}	16		20		30
D4 _{g6}	44		60		80
D7	70		84		118
L2	31		31		37
L3	3.5		3.5		3.5
L4	9		10.2		12.5
L5	10.2		10.9		13
L7	6		6		10
L11	31	23.4	37.3	31	37.3
W1	125°		90°		90°
W2	27.5°		22.5°		22.5°
W3	27.5°		67.5°		67.5°
C1 ²	70	46	90	70	90
C2 ²	M5x0.8P	M4x0.7P	M6x1.0P	M5x0.8P	M6x1.0P
C3 ²	≤14/≤19	≤8/≤11	≤19/≤24/≤28	≤14/≤19	≤19/≤24/≤28
C4 ²	33.5	26.5	41	33.5	41
C5 ² _{F6}	50	30	70	50	70
C6 ²	4	4	6	4	6
C7 ²	60	42.6	90	60	90
C8 ²	41.5	32.9	51.5	41.5	51.5
C9 ²	128.6	113.3	160.3	145.8	193.6

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

PGW Specifications Table

Specifications	Stage	Ratio	PGW-60	PGW-90	PGW-115	
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 ²	dBA/1m	1,2,3	3-1000	63	66	67
Protection Class	-	1,2,3	3-1000	IP65		
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 ²	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)/ -60T(ψ8)	PGW-90(ψ19) / -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	
Stage	Ratio		PGW-60T(ψ8)	PGW-90T(ψ14)	PGW-115T(ψ19)	
3	All ratios		0.03	0.21	0.61	
* 1. Applied to the output shaft center at 100 rpm.						
* 2. Measured at 3000 rpm with no load. These values are measured by gearbox with ratio = 10 (1-stage) or ratio = 100 (2-stage) at nominal input speed or 3000 rpm (if nominal input speed is higher than 3000 rpm) with no load.						
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PLANETARY GEARHEADS

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