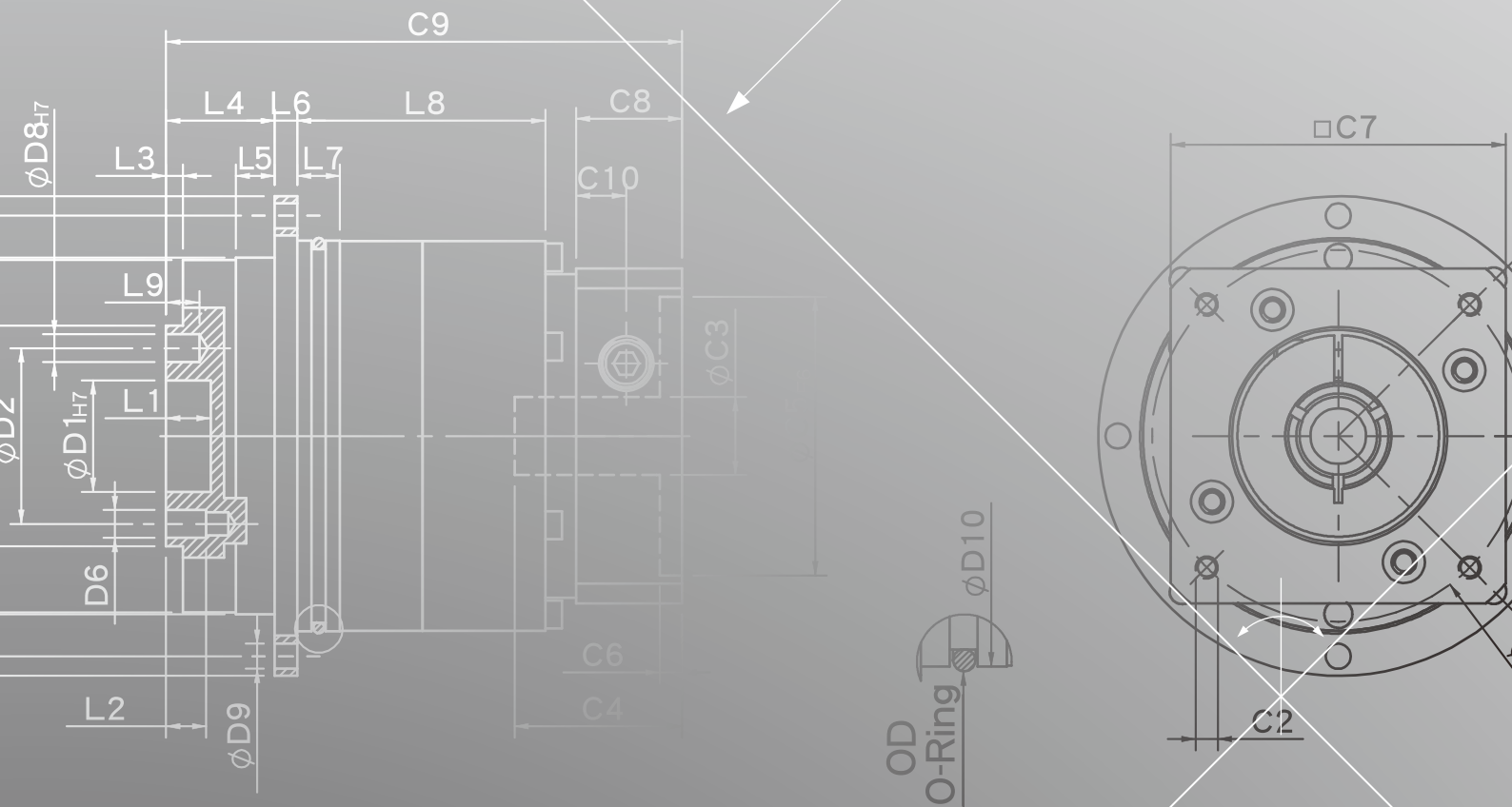
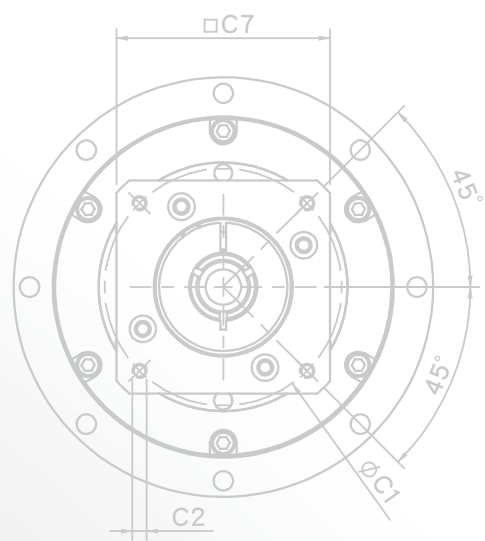
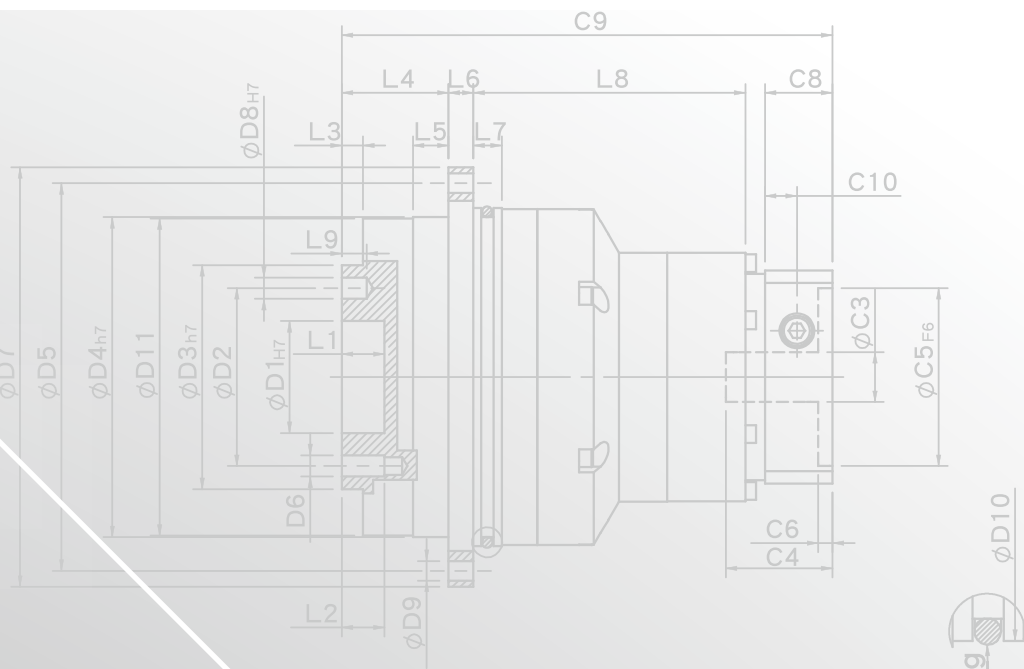
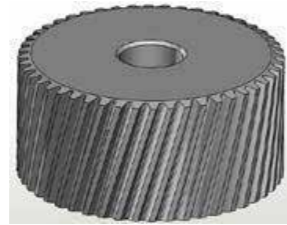


# ***PHF*** SERIES

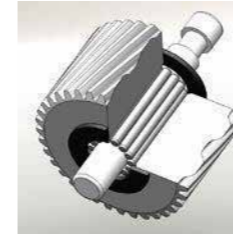




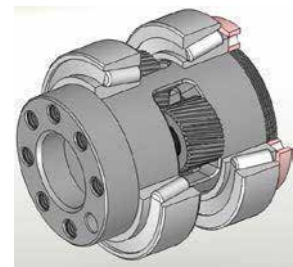
PHF SERIES FEATURES



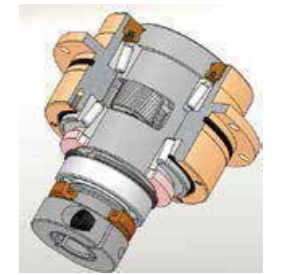
Alloy steel gear with unique heat treatment. Additionally, with gear grinding process-ing to get the best accuracy, high wear resistance and high impact toughness.



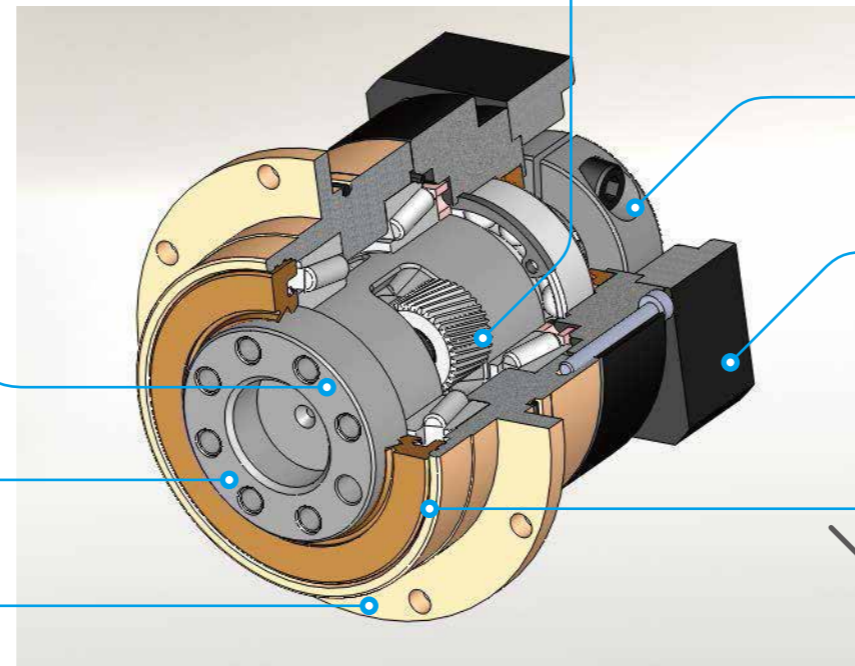
Planet gear transmission interface equipped with needle bearings, full needle roller bearings aligned without retainer achieve maximum exposure but smallest gap tolerances. Enhance over-all gear structure rigid and output torque.



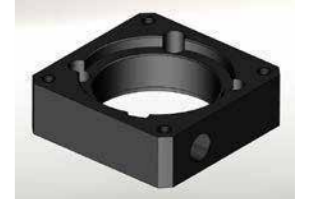
Planetary arm bracket and output shaft are one-piece constructed, using tapered roller bearings can bear the axial load and radial load that are more than deep groove ball bearings. Setting the bearing apart for larger span to reach the largest torsional rigidity and contribute high axial load and radial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



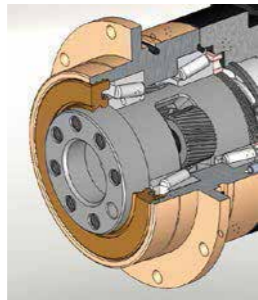
Input-end and motor shaft are coupled through a dynamic balanced collar clamping mechanism to ensure connection interface concentricity and zero slip power transmission at high speed.



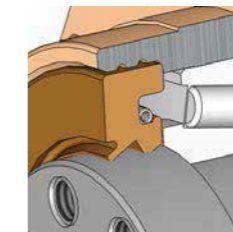
Advanced motor bracket design coupled with the input shaft bushing is easy to mount to any servo or stepper motor.



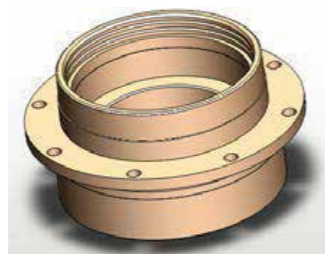
Grinding process to smooth surface of output shaft, and with oil seal to minimum friction coefficient and reducing start up load; result in the best seal-ability and extended lifespan. Hollow out-put shaft connect perfectly with circular flange drastically reducing the installation space.



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.



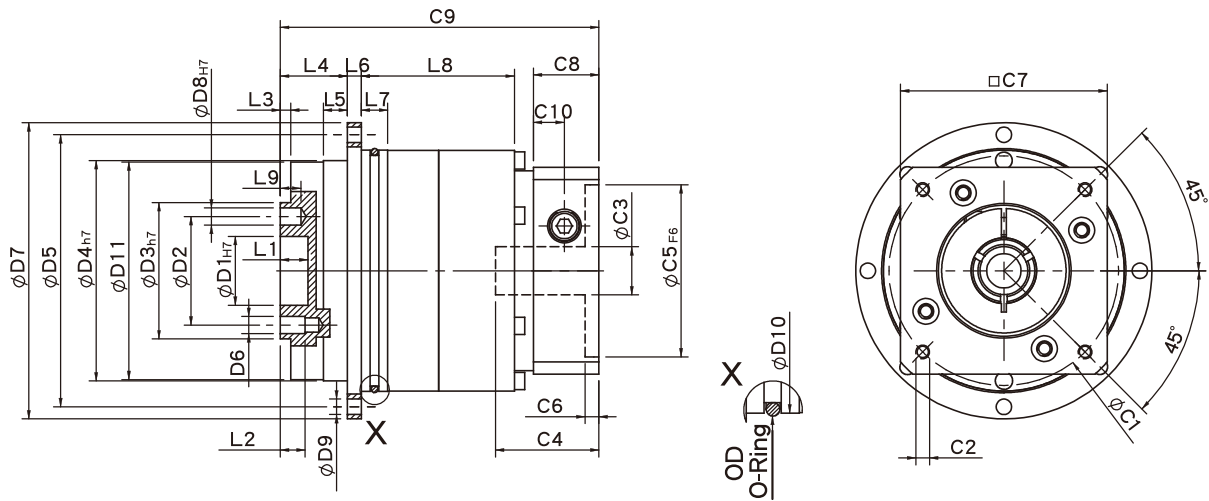
High-tech oil seal design on the upper lip guard against dust intruder, lower lip to guard against oil leak. Protection grade IP65 safeguards fully avoid leaking problem, and given it maintenance-free.



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

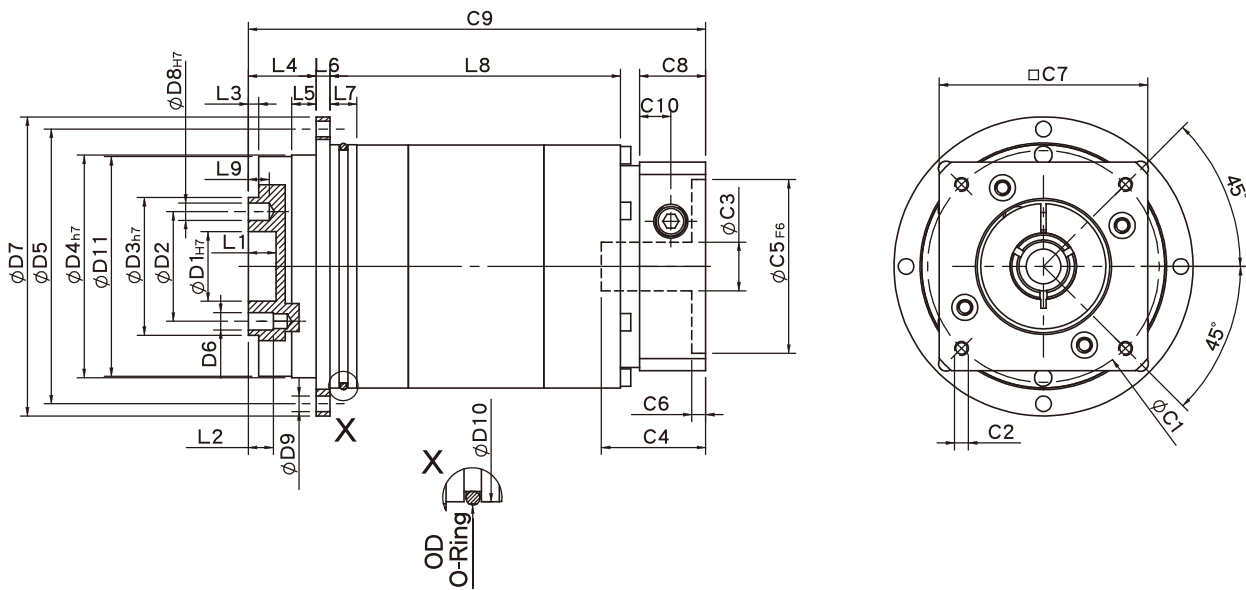
Unit:mm

Dimensions	PHF42	PHF60	PHF90	PHF115	PHF142	PHF200	PHF255
D1 <sub>H7</sub>	12	20	31.5	40	50	80	100
D2	20	31.5	50	63	80	125	140
D3 <sub>H7</sub>	28	40	63	80	100	160	180
D4 <sub>H7</sub>	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 <sub>H7</sub>	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 <sup>2</sup>	46	70	90	115	145	200	235
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P	M12x1.75P
C3 <sup>2</sup>	≤8/≤11	≤14/≤19	≤19/≤24	≤24/≤32/≤38	≤35/≤38	≤50	≤55
C4 <sup>2</sup>	28.1	36.5	41.2	51.1	69.7	81	112
C5 <sup>2</sup> <sub>F6</sub>	30	50	70	95	110	114.3	200
C6 <sup>2</sup>	4	4	6.7	6	8.5	6	6
C7 <sup>2</sup>	42	60	90	115	140	182	220
C8 <sup>2</sup>	16.5	19	25.5	30	38	40	50
C9 <sup>2</sup>	74.8	92.5	107	131.5	171.5	215	271
C10 <sup>2</sup>	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

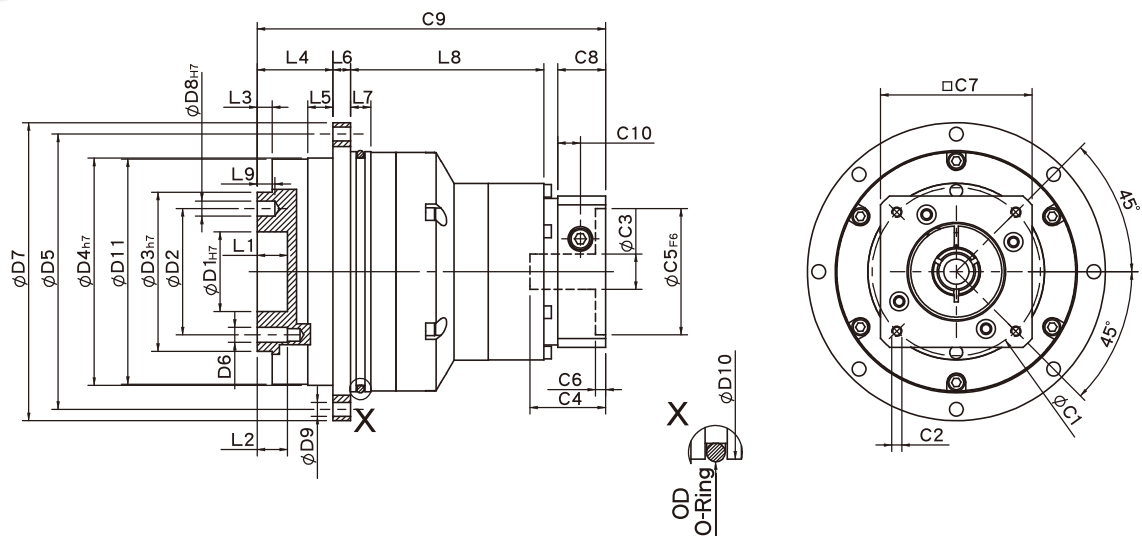
Unit:mm

Dimensions	PHF42	PHF60	PHF90
D1 <sub>H7</sub>	12	20	31.5
D2	20	31.5	50
D3 <sub>h7</sub>	28	40	63
D4 <sub>h7</sub>	47	64	90
D5	67	79	109
D6	M3x0.5P	M5x0.8P	M6x1.0P
D7	72	86	118
D8 <sub>H7</sub>	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 <sup>2</sup>	46	70	90
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M6x1.0P
C3 <sup>2</sup>	≤8/≤11	≤14/≤19	≤19/≤24
C4 <sup>2</sup>	28.1	36.4	41.2
C5 <sup>2</sup> <sub>F6</sub>	30	50	70
C6 <sup>2</sup>	4	4	6.7
C7 <sup>2</sup>	42	60	90
C8 <sup>2</sup>	16.5	19	25.5
C9 <sup>2</sup>	102.5	127.5	151.1
C10 <sup>2</sup>	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

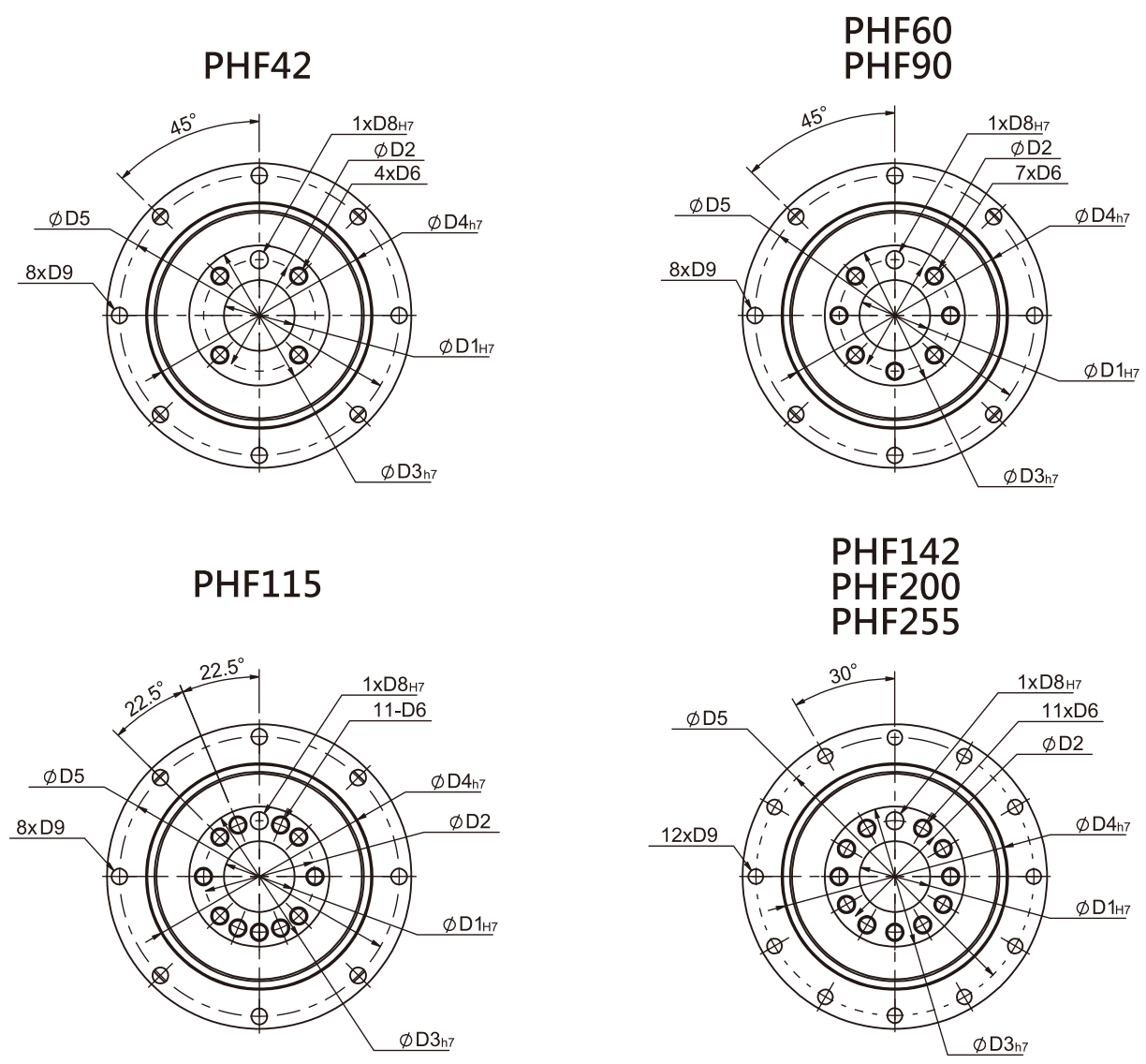
Unit:mm

Dimensions	PHF60T	PHF90T	PHF115T	PHF142T	PHF200T	PHF255T
D1 <sub>H7</sub>	20	31.5	40	50	80	100
D2	31.5	50	63	80	125	140
D3 <sub>h7</sub>	40	63	80	100	160	180
D4 <sub>h7</sub>	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 <sub>H7</sub>	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 <sup>2</sup>	46	70	90	115	145	200
C2 <sup>2</sup>	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M8x1.25P	M12x1.75P
C3 <sup>2</sup>	≤8/≤11	≤14/≤19	≤19/≤24	≤24/≤32/≤38	≤35/≤38	≤50
C4 <sup>2</sup>	28.1	36.5	41.2	51.1	69.7	81
C5 <sup>2</sup> <sub>F6</sub>	30	50	70	95	110	114.3
C6 <sup>2</sup>	4	4	6.7	6	8.5	6
C7 <sup>2</sup>	42	60	90	115	140	180
C8 <sup>2</sup>	16.5	19	25.5	30	38	40
C9 <sup>2</sup>	113.2	138	163.1	198	281	335
C10 <sup>2</sup>	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 <sub>H7</sub>	12	20	31.5	40	50	80	100
D2	20	31.5	50	63	80	125	140
D3 <sub>h7</sub>	28	40	63	80	100	160	180
D4 <sub>h7</sub>	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 <sub>H7</sub>	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 <sup>2</sup>	dBA/1m	1,2	3-100	56	58	60	63	65	67	70
Protection Class	-	1,2	3-100	IP65						
Lubrication	-	1,2	3-100	Synthetic Lubricant						
Inertia (J1)										
Stage	Ratio	unit	PHF-42	PHF-60	PHF-90	PHF-115	PHF-142	PHF-200	PHF-255	
1	3	Kg • cm <sup>2</sup>	-	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.