



APEX DYNAMICS, INC.

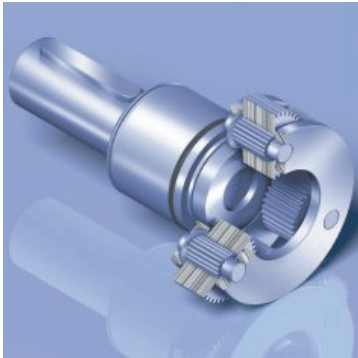


PE/PG/PN/PB
SERIES

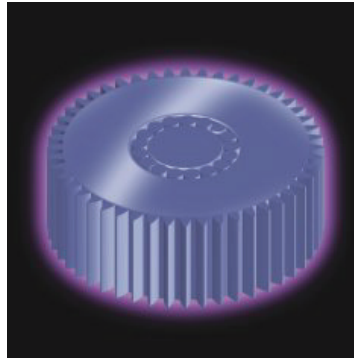
Planetary Gearboxes

PE/PG/PN/PB Series

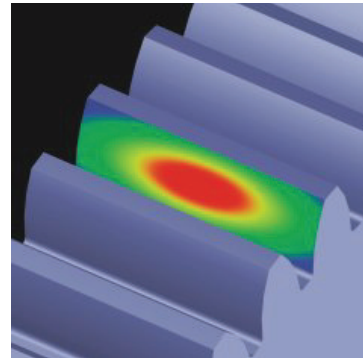
Characteristic Highlights



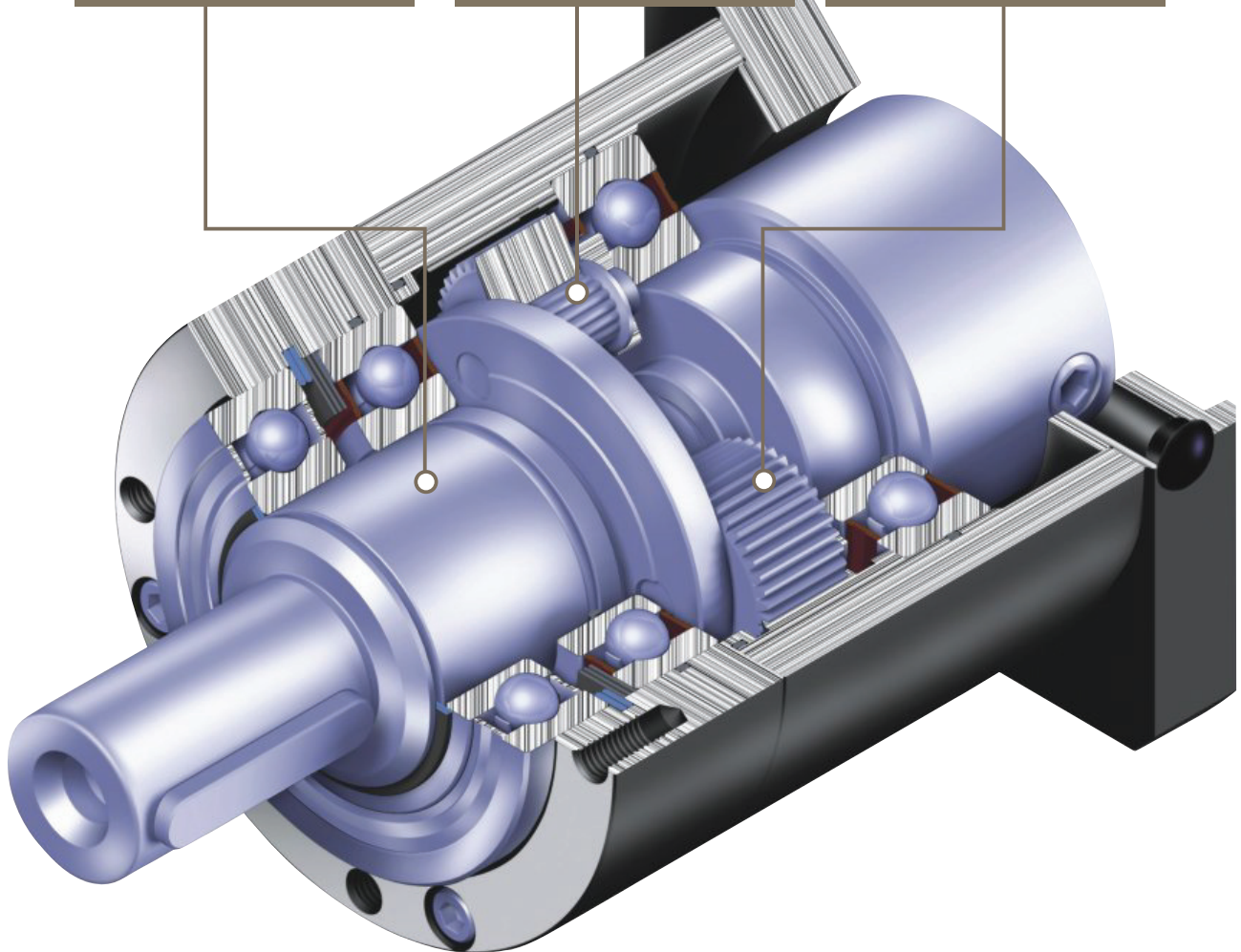
One piece planet carrier and planet gearing is supported on both sides. Provide maximum radial load capacity and increase system reliability and stiffness.



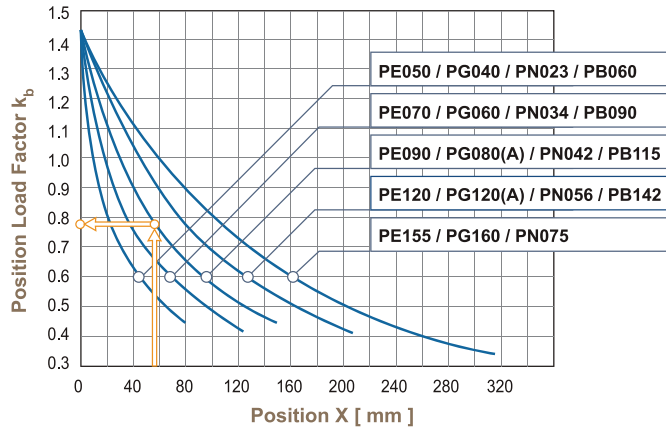
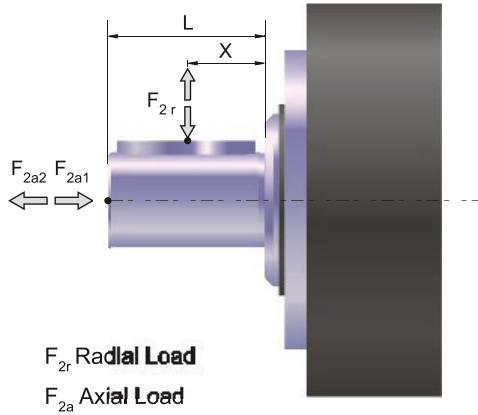
Equipped with *solid uncaged needle roller bearings*, provides maximum contact points to increase stiffness and generates high output torque. *Our in-house plasma nitriding* heat treatment process maintains the tooth surface hardness at **900Hv** for superior wear-resistance and a core hardness at **30 HRC** for toughness.



A high setting gear performance is achieved by using our *HeliTopo technology*. This *eases off the tooth profile and crowns the lead of each tooth*. This optimizes the gear mesh alignment and overlap to achieve maximum tooth surface contact.

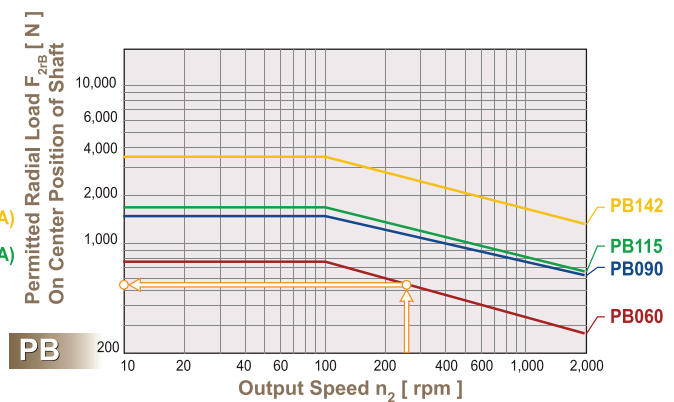
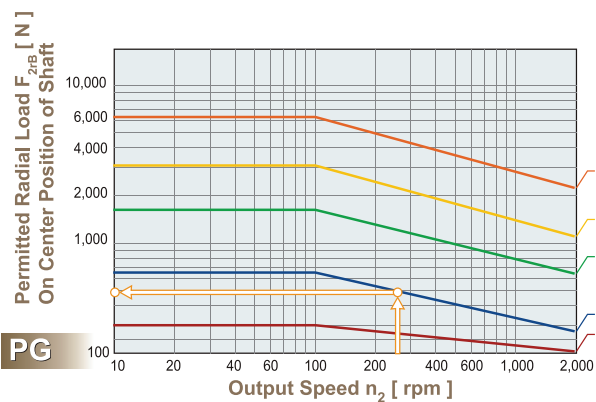
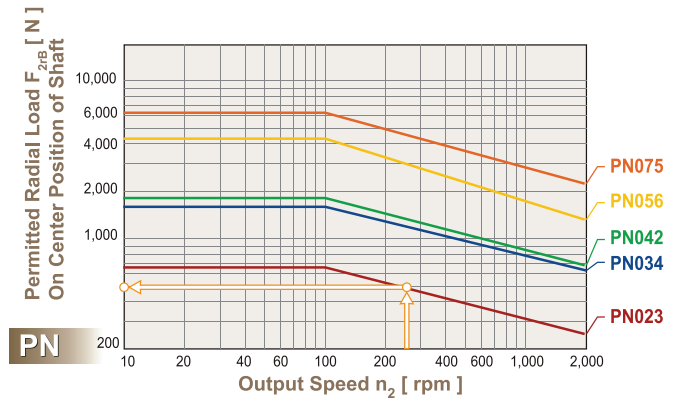
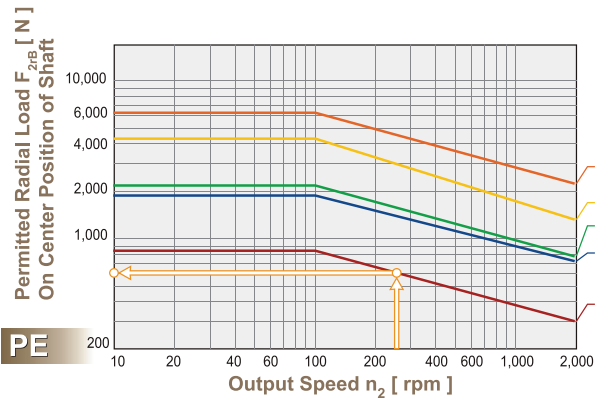


Permitted Radial and Axial Loads on Output Shaft of the Gearbox



The permitted radial and axial loads on output shaft of the gearbox depend on the design of the gearbox supporting bearings.

If radial force F_{2r} is not exerted on the center of the output shaft $X < 1/2xL$ or $X > 1/2xL$. The permitted radial and axial loads can be calculated by the position load factor K_b on the above diagram.



If radial force F_{2r} exert on the center of the output shaft $X = 1/2xL$. Under various operating condition the lifetime is over 20,000* hours. The permitted radial load is given on the above diagram.

* S1 service life 10,000 hrs (Consult us)

PE Series Specifications

Gearbox Performance

Model No.	Stages	Ratio ¹	PE050	PE070	PE090	PE120	PE155		
Nominal Output Torque T_{2N}	1	3	14	39	104	215	423		
		4	12	31	85	176	364		
		5	14	39	104	215	423		
		7	12	33	91	195	358		
		10	9	26	65	150	293		
	2	15	14	39	104	215	423		
		16	12	31	85	176	364		
		20	12	31	85	176	364		
		25	14	39	104	215	423		
		30	14	39	104	215	423		
		35	12	33	91	195	358		
		40	12	31	85	176	364		
		50	14	39	104	215	423		
		70	12	33	91	195	358		
	100	9	26	65	150	293			
	Emergency Stop Torque T_{2NOT}^2	Nm	1,2	3~100	3 times of Nominal Output Torque				
	Nominal Input Speed n_{1N}	rpm	1,2	3~100	4,500	4,000	3,600	3,000	2,500
Max. Input Speed n_{1B}	rpm	1,2	3~100	8,000	6,000	6,000	4,800	3,600	
Backlash*	arcmin	1	3~10	≤ 8	≤ 8	≤ 6	≤ 6	≤ 6	
		2	15~100	≤ 10	≤ 10	≤ 8	≤ 8	≤ 8	
Torsional Rigidity	Nm/arcmin	1,2	3~100	2	4.4	13.5	35.6	64	
Max. Radial Load F_{2RB}^3	N	1,2	3~100	820	1,910	2,060	4,160	6,450	
Max. Axial Load F_{2aB}^3	N	1,2	3~100	410	955	1,030	2,080	3,225	
Service Life	hr	1,2	3~100	20,000*					
Efficiency η	%	1	3~10	≥ 97%					
		2	15~100	≥ 94%					
Weight	kg	1	3~10	0.8	1.9	3.8	8.9	18.0	
		2	15~100	1.1	2.7	5.2	12.2	24.6	
Operating Temp	°C	1,2	3~100	-10°C~90°C					
Lubrication				Synthetic lubrication grease					
Degree of Gearbox Protection		1,2	3~100	IP64					
Mounting Position		1,2	3~100	all directions					
Noise Level ($n_1=3000\text{rpm}$, No Load)	dB(A)	1,2	3~100	≤ 68	≤ 70	≤ 72	≤ 74	≤ 75	

Gearbox Inertia

Model No.	Stages	Ratio ¹	PE050	PE070	PE090	PE120	PE155
Mass Moments of Inertia J_1	1	3	0.15	0.53	3.00	10.69	31.86
		4	0.15	0.51	2.83	10.08	29.82
		5	0.15	0.50	2.80	9.96	29.43
		7	0.15	0.50	2.79	9.91	29.26
		10	0.15	0.50	2.79	9.89	29.20
	2	15	0.15	0.50	2.80	9.96	29.43
		16	0.15	0.51	2.83	10.08	29.82
		20	0.15	0.50	2.80	9.96	29.43
		25	0.15	0.50	2.80	9.96	29.43
		30	0.15	0.50	2.80	9.96	29.43
		35	0.15	0.50	2.80	9.96	29.43
		40	0.15	0.50	2.79	9.89	29.20
		50	0.15	0.50	2.79	9.89	29.20
		70	0.15	0.50	2.79	9.89	29.20
	100	0.15	0.50	2.79	9.89	29.20	

1. Ratio ($i=N_{in}/N_{out}$)

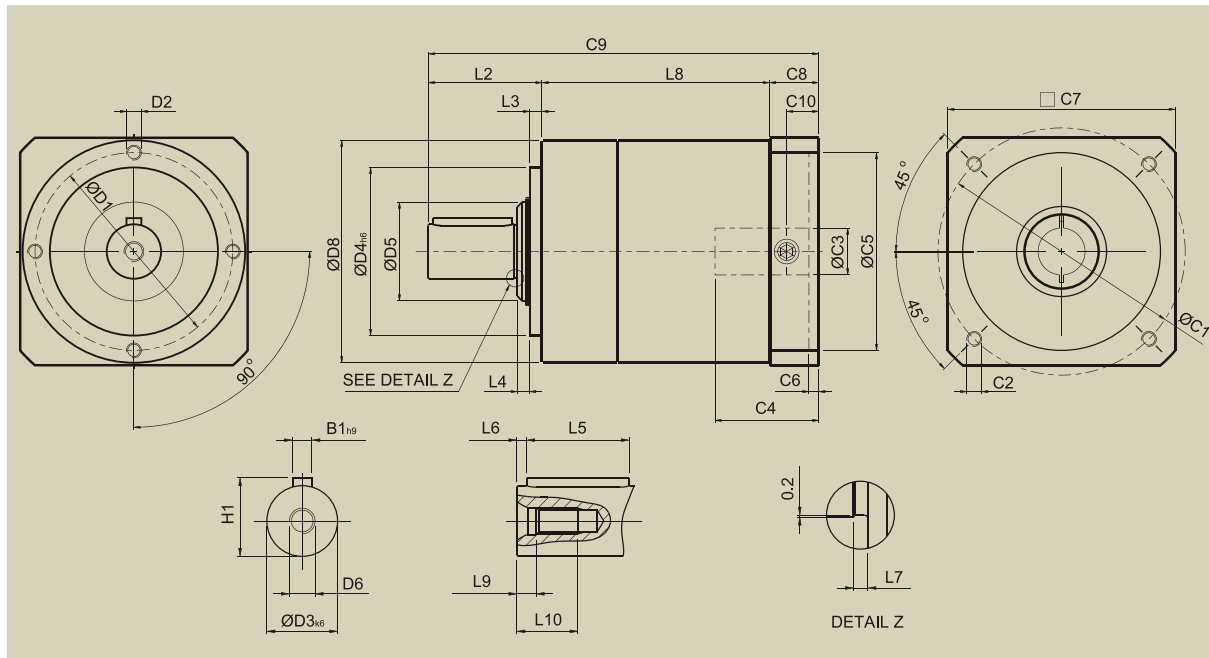
2. $T_{2B} = 60\%$ of T_{2NOT}

3. Applied to the output shaft center @ 100 rpm

*S1 service life 10,000 hrs (Consult us)

*Backlash is measured at 2% of Nominal Output Torque T_{2N}

PE Series Dimension



[unit: mm]

Dimension	PE050	PE070	PE090	PE120	PE155
D1	44	62	80	108	140
D2	M4X9	M5X10	M6X12	M8X15	M10X18
D3 _{k6}	12	16	22	32	40
D4 _{h6}	35	52	68	90	120
D5	17	25	40	50	65
D6	M4X0.7P	M5X0.8P	M8X1.25P	M12X1.75P	M16X2P
D8	50	70	90	120	155
L2	24.5	36	46	70	97
L3	4	5	5	6	8
L4	2.5	3	5	6	7
L5	14	25	32	50	70
L6	2	2	2	4	6
L7	1	1	1.5	2	2
L8	1-stage	55	77	127	145
	2-stage	79.5	110	131.5	205.5
L9	4.5	4.8	7.2	10	12
L10	10	12.5	19	28	36
C1 ⁴	46	70	100	130	165
C2 ⁴	M4X0.7P	M5X0.8P	M6X1P	M8X1.25P	M10X1.5P
C3 ⁴	≤ 12	≤ 16	≤ 24	≤ 32	≤ 38
C4 ⁴	30	34	40	50	60
C5 ⁴	30	50	80	110	130
C6 ⁴	3.5	8	4	5	6
C7 ⁴	52	72	92	122	157
C8 ⁴	21.5	21.5	20	24	31
C9 ⁴	1-stage	101	134.5	158	221
	2-stage	125.5	167.5	197.5	274
C10 ⁴	14.5	15.5	13	16	21
B1 _{h9}	4	5	6	10	12
H1	13.5	18	24.5	35	43

4. C1-C10 are motor specific dimensions (metric std shown). Refer to Apexdyna.com and Design Tool to view your specific motor mounting system.

PE /PG/PN/PB SERIES

Ordering Code

PE090

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010

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MOTOR

Gear Size:

PE: PE050, PE070, PE090, PE120, PE155

PG: PG040, PG060, PG080, PG080A, PG120, PG120A, PG160

PN: PN 023, PN034, PN042, PN056, PN075

PB: PB060, PB090, PB115, PB142

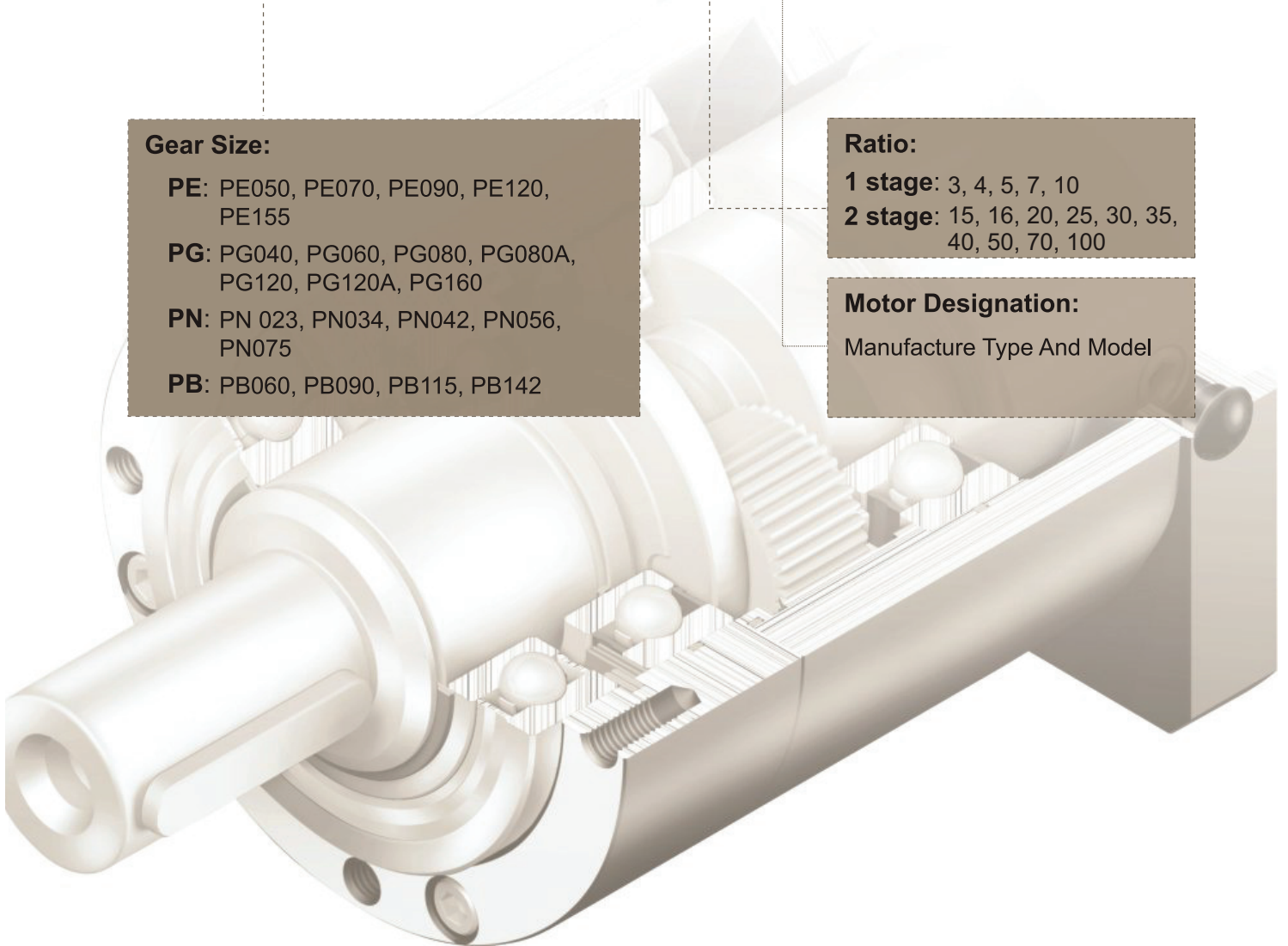
Ratio:

1 stage: 3, 4, 5, 7, 10

2 stage: 15, 16, 20, 25, 30, 35, 40, 50, 70, 100

Motor Designation:

Manufacture Type And Model



Ordering Example: PE090-010 / SIEMENS 1FT6 041-4AF71



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