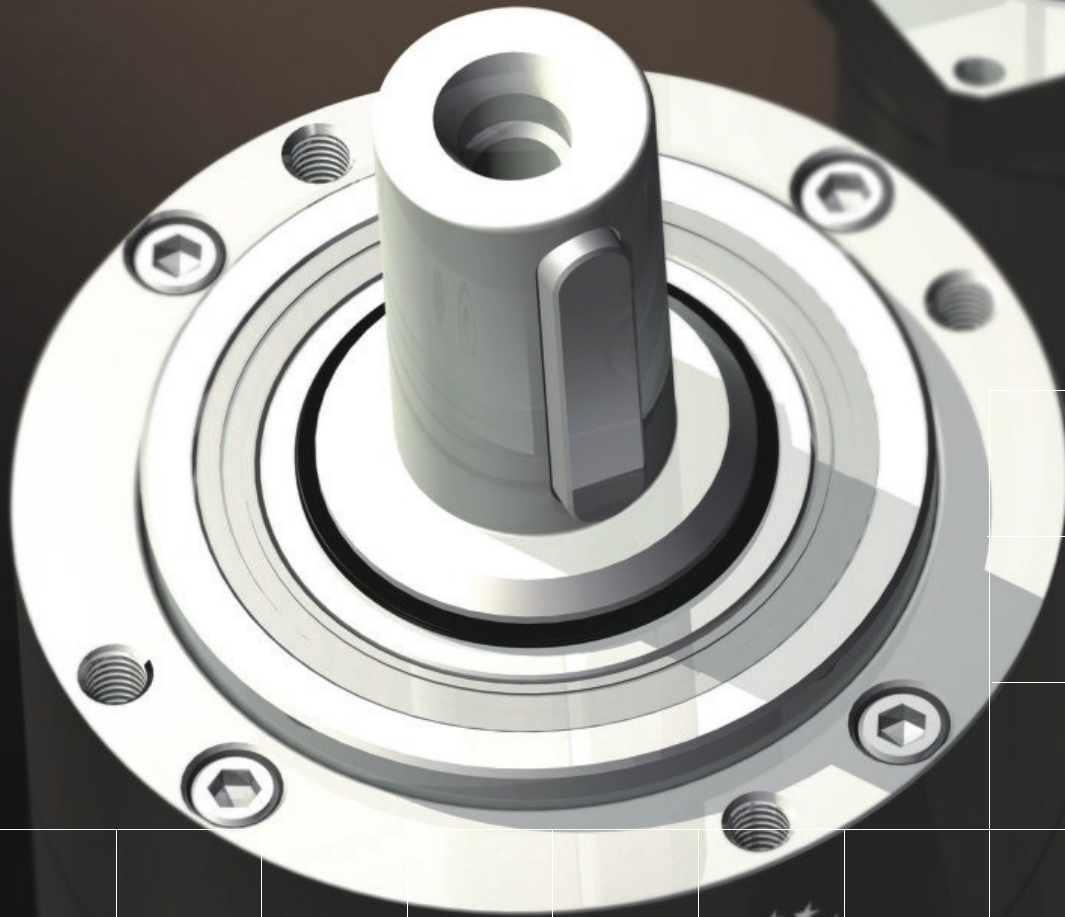




**APEX DYNAMICS, INC.**

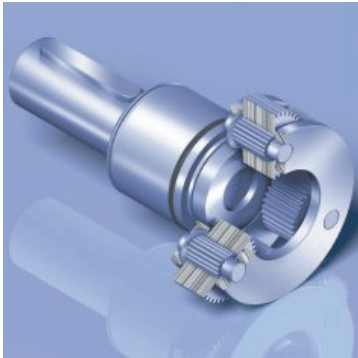


***PE/PG/PN/PB***  
***SERIES***

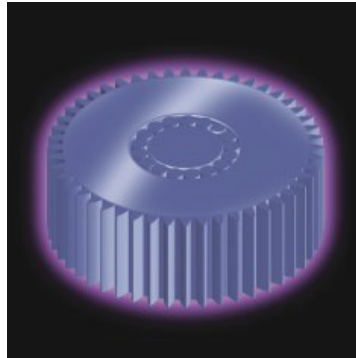
***Planetary Gearboxes***

# PE/PG/PN/PB Series

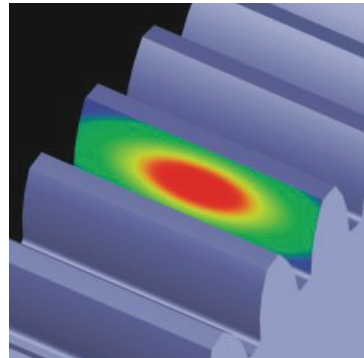
## Characteristic Highlights



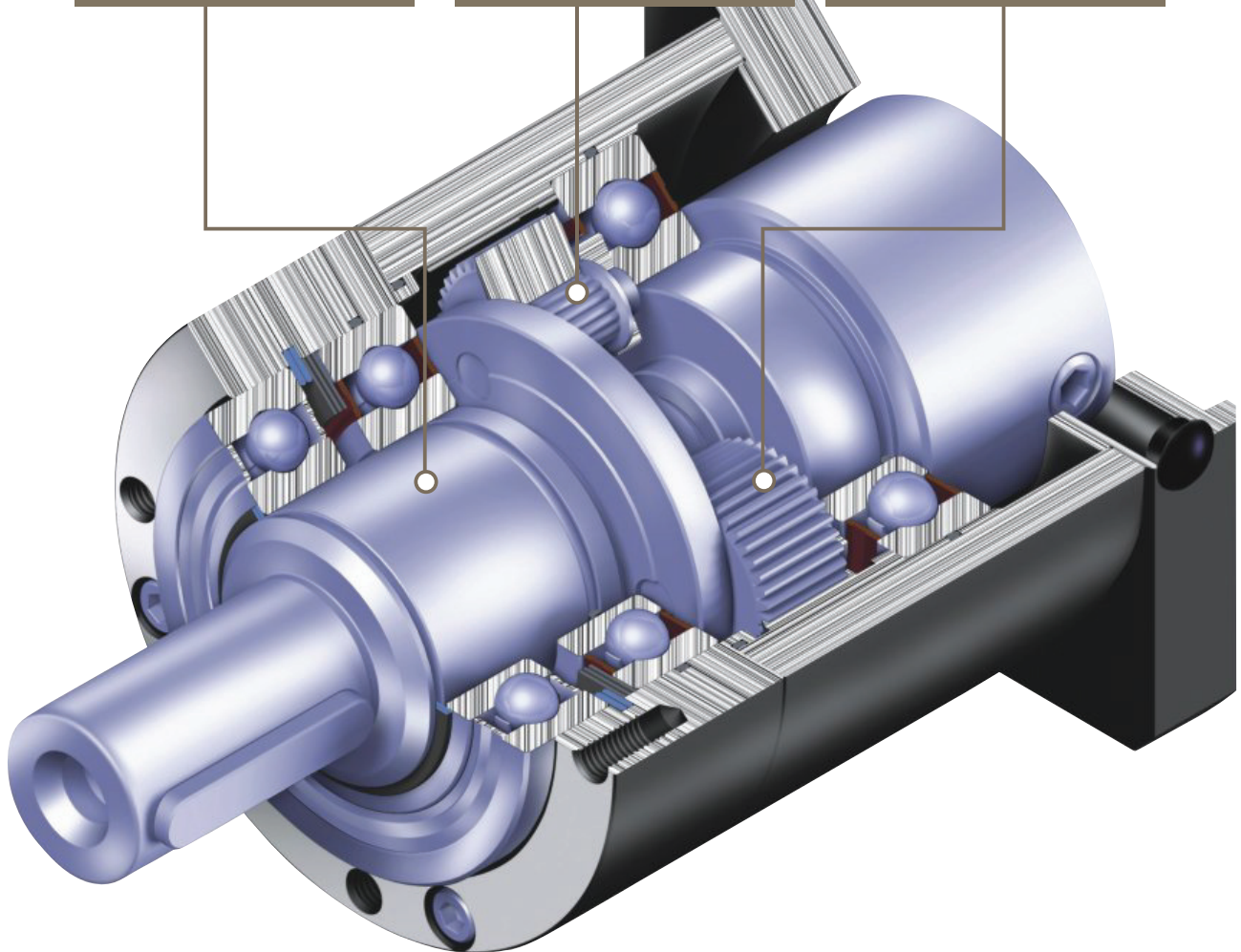
*One piece planet carrier and planet gearing is supported on both sides.* Provide maximum radial load capacity and increase system reliability and stiffness.



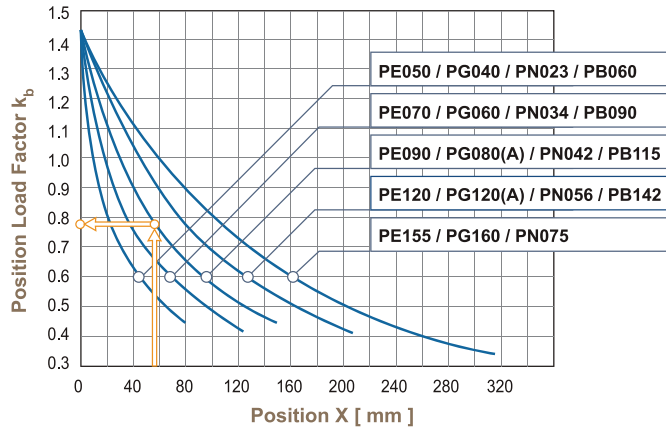
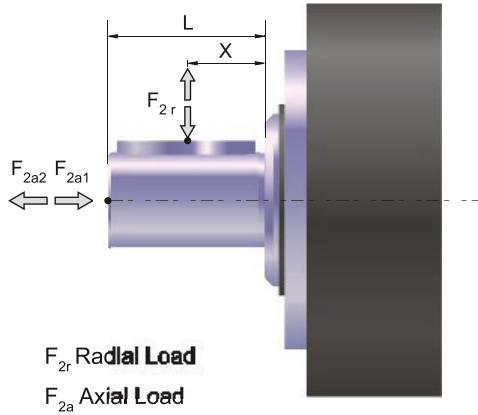
Equipped with *solid uncaged needle roller bearings*, provides maximum contact points to increase stiffness and generates high output torque. *Our in-house plasma nitriding* heat treatment process maintains the tooth surface hardness at **900Hv** for superior wear-resistance and a core hardness at **30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

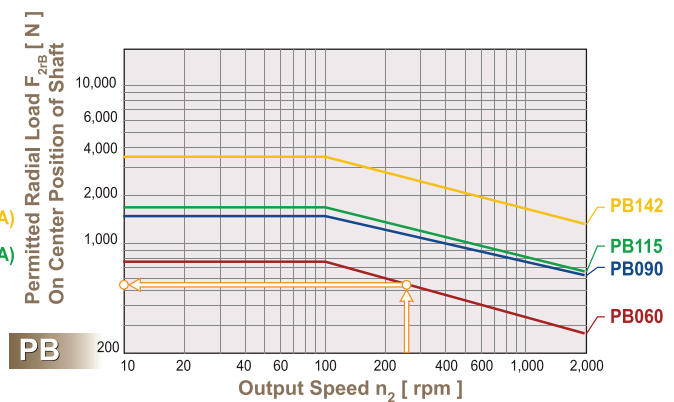
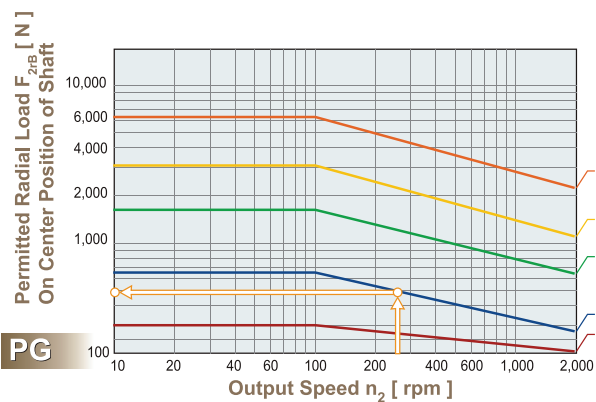
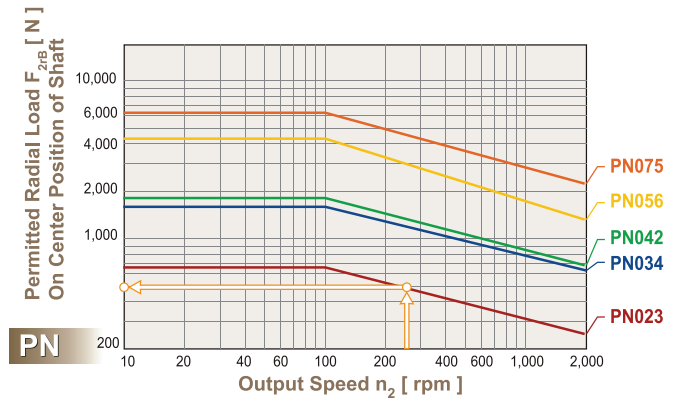
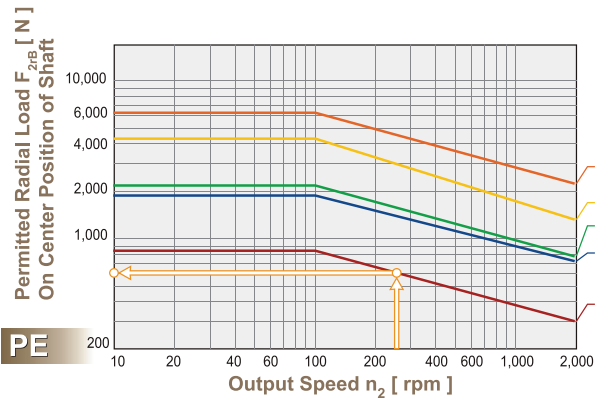


# Permitted Radial and Axial Loads on Output Shaft of the Gearbox



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)

# PN Series Specifications

## Gearbox Performance

Model No.	Stages	Ratio <sup>1</sup>	PN023	PN034	PN042	PN056	PN075	
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 $T_{2NOT}$ <sup>2</sup>	Nm	1,2	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	1.6	6.4	17.5	62.8	143.5
Max. Radial Load $F_{2RB}$ <sup>3</sup>	N	1,2	3~100	680	1,770	1,830	4,140	6,440
Max. Axial Load $F_{2aB}$ <sup>3</sup>	N	1,2	3~100	340	885	915	2,070	3,220
Service Life	hr	1,2	3~100	20,000*				
Efficiency $\eta$	%	1	3~10	≥ 97%				
		2	15~100	≥ 94%				
Weight	kg	1	3~10	0.8	2.3	4.6	9.7	19.7
		2	15~100	1.1	3.0	6.0	13.0	26.3
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 <sup>1</sup>	PN023	PN034	PN042	PN056	PN075
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 ( $i=N_{in}/N_{out}$ )

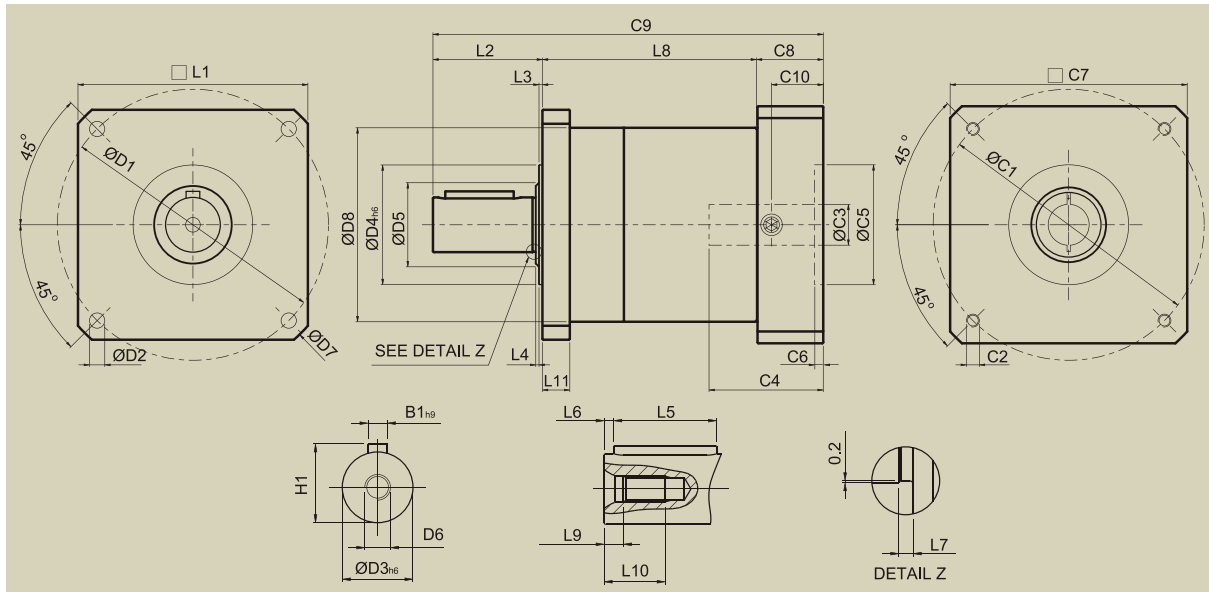
2.  $T_{2B} = 60\%$  of  $T_{2NOT}$

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  $T_{2N}$

# PN Series Dimension



[unit: mm(inch)]

Dimension	PN023	PN034	PN042	PN056	PN075
D1	66.675(2.625)	98.425(3.875)	125.73(4.950)	177.8(7.0)	215.011(8.465)
D2	5.2(0.205)	5.6(0.220)	7.1(0.280)	10.4(0.409)	14.2(0.559)
D3 h <sub>6</sub>	12.7(0.5)	19.05(0.750)	25.4(1.0)	38.1(1.5)	50.8(2.0)
D4 h <sub>6</sub>	38.1(1.5)	73.025(2.875)	55.5(2.185)	114.3(4.5)	152.4(6.0)
D5	17	25	40	50	65
D6	M4X0.7P	M5X0.8P	M8X1.25P	M12X1.75P	M16X2P
D7	75	107.5	142	198	260
D8	50	70	90	120	155
L1	57.15(2.250)	82.55(3.250)	106.68(4.2)	146.05(5.750)	190(7.480)
L2	31.75	38.1	50.8	63.5	88.9
L3	1.6(0.063)	1.6(0.063)	1.6(0.063)	3.2(0.126)	4.75(0.187)
L4	1	1.5	1.5	2	2
L5	19.05(0.750)	25.4(1.0)	31.75(1.250)	38.1(1.5)	63.5(2.5)
L6	3.788(0.149)	3.8(0.150)	5.715(0.225)	8.563(0.337)	8.563(0.337)
L7	1	1	1.5	2	2
L8	1-stage	58.9	82	99.3	133.7
	2-stage	83.4	115	138.8	186.7
L9	4.5	4.8	7.2	10	12
L10	10	12.5	19	28	36
L11	6.4	7.9	12.7	19.05	22.2
C1 <sup>4</sup>	66.675(2.625)	98.425(3.875)	125.73(4.950)	149.225(5.875)	165
C2 <sup>4</sup>	M4X0.7P	M5X0.8P	M6X1P	11 Thru	M10X1.5P
C3 <sup>4</sup>	≤ 12	≤ 16	≤ 24	≤ 32	≤ 38
C4 <sup>4</sup>	32(1.260)	40(1.575)	51(2.008)	55(2.165)	60
C5 <sup>4</sup>	38.15(1.502)	73.08(2.877)	55.65(2.191)	114.3(4.5)	130
C6 <sup>4</sup>	3.5(0.138)	4(0.157)	4(0.157)	4(0.157)	6
C7 <sup>4</sup>	55(2.165)	85(3.346)	110(4.331)	130(5.118)	157
C8 <sup>4</sup>	23.5(0.925)	27.5(1.083)	31(1.220)	29(1.142)	31
C9 <sup>4</sup>	1-stage	114.15(4.494)	147.6(5.811)	181.1(7.130)	226.2(8.905)
	2-stage	138.65(5.459)	180.6(7.110)	220.6(8.685)	279.2(10.992)
C10 <sup>4</sup>	16.5(0.650)	21.5(0.846)	24(0.945)	21(0.827)	21
B1 h <sub>9</sub>	3.175(0.125)	4.763(0.188)	6.35(0.250)	9.525(0.375)	9.525(0.375)
H1	14.125(0.556)	21.163(0.833)	28.2(1.110)	42.275(1.664)	55.125(2.170)

4. C1~C10 are NEMA motor specific dimensions (except for PN075). Refer to Apexdyna.com and Design Tool to view your specific motor mounting system.

# PE /PG/PN/PB SERIES

## Ordering Code

PE090

—

010

/

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

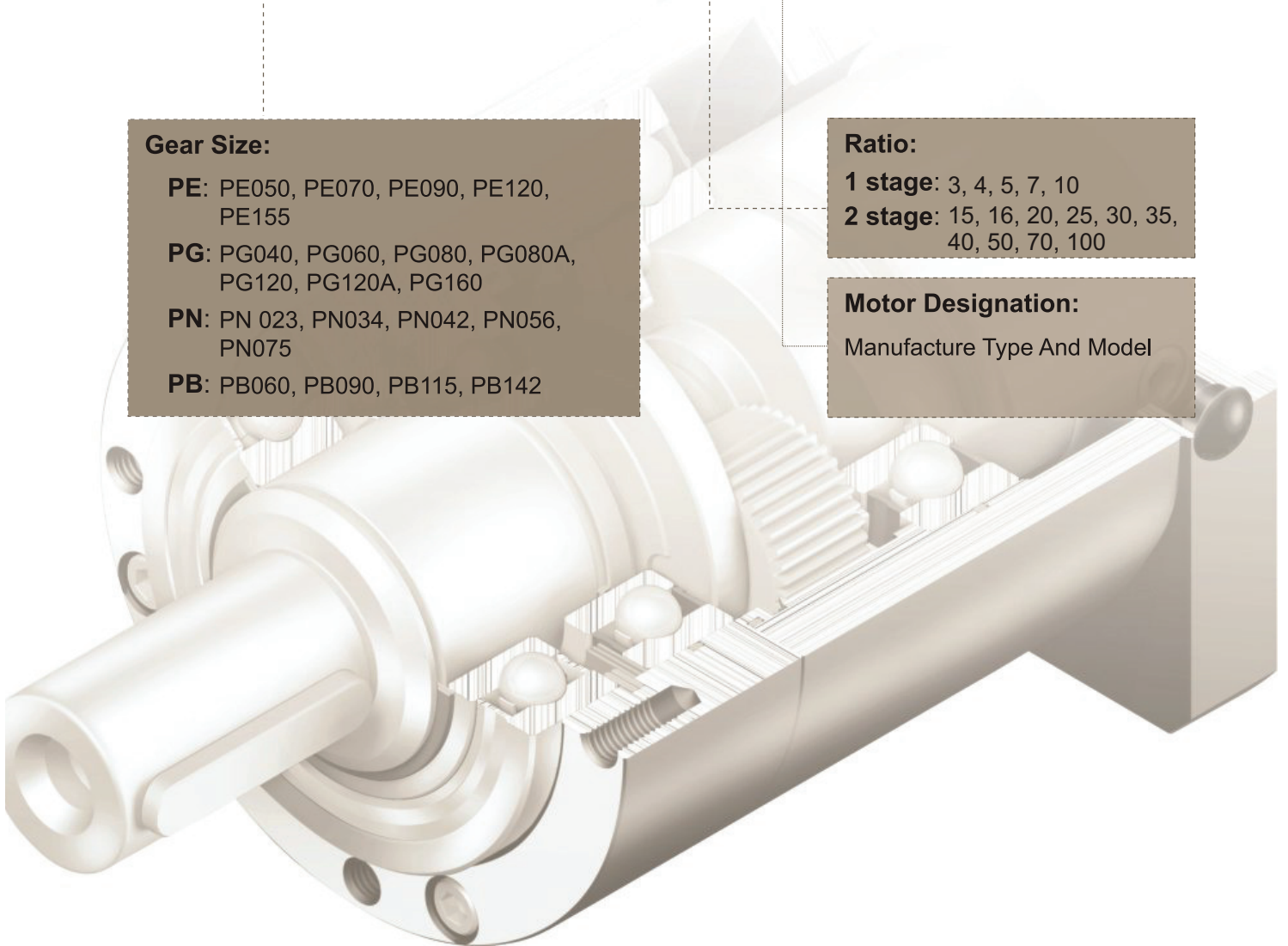
### Ratio:

**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



**APEX DYNAMICS, INC.**

