



APEX DYNAMICS, INC.

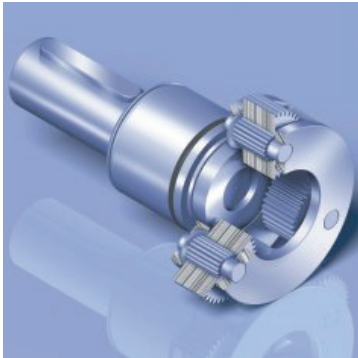


PE/PG/PN/PB
SERIES

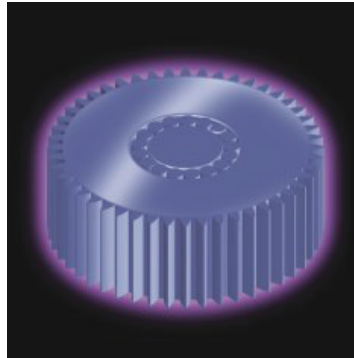
Planetary Gearboxes

PE/PG/PN/PB Series

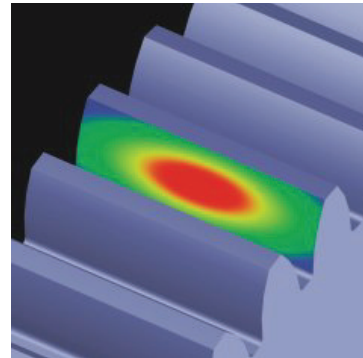
Characteristic Highlights



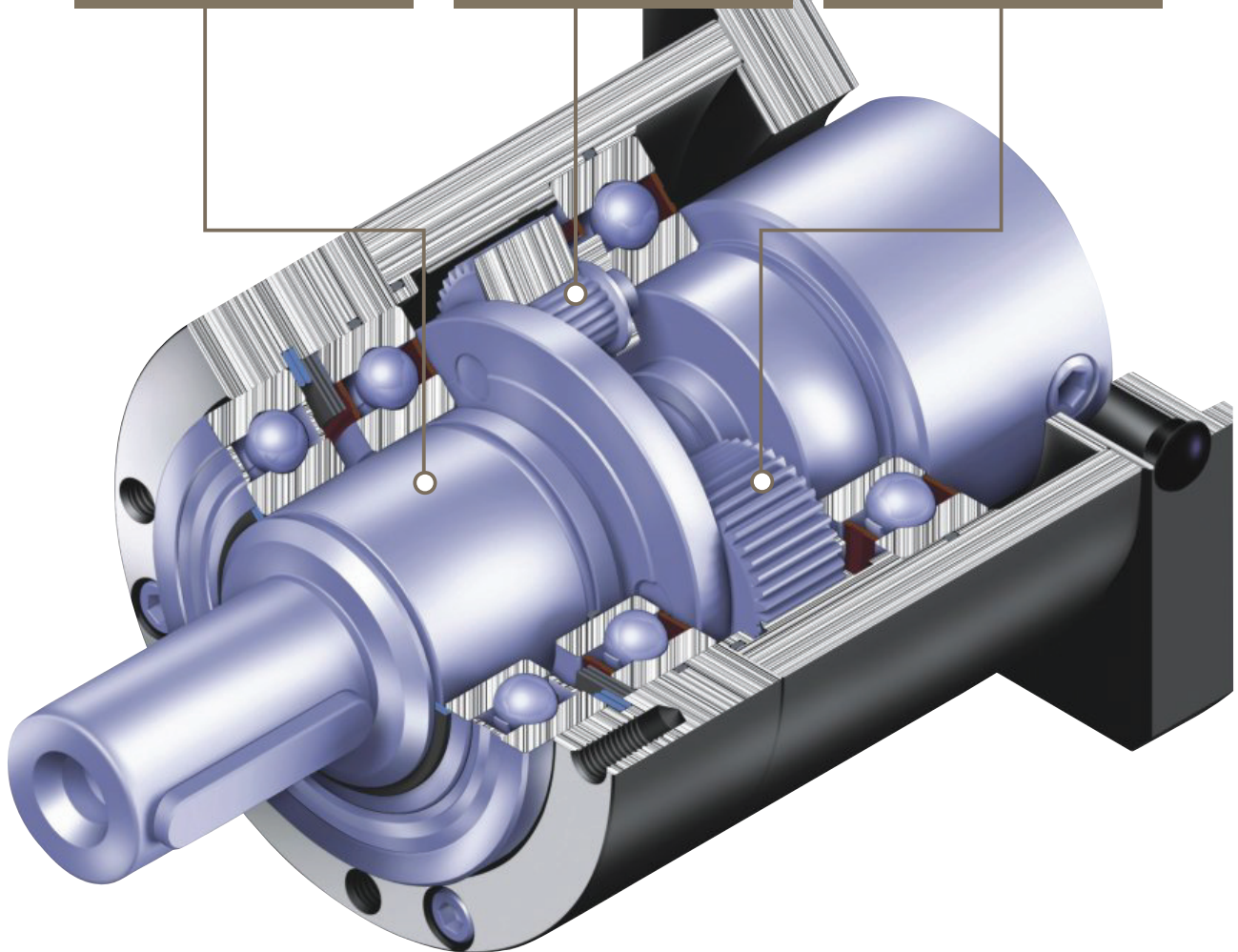
One piece planet carrier and planet gearing is supported on both sides. Provide maximum radial load capacity and increase system reliability and stiffness.



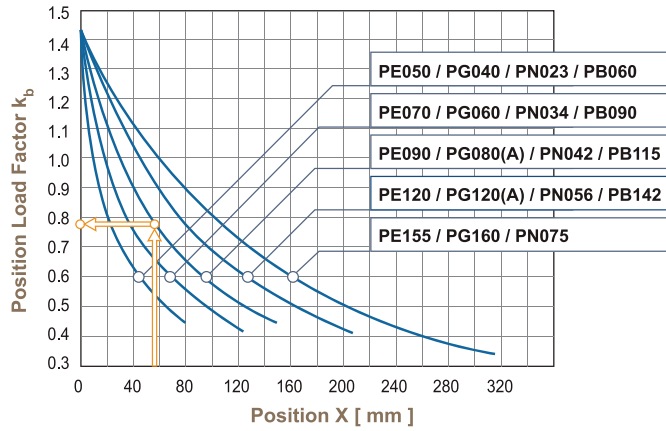
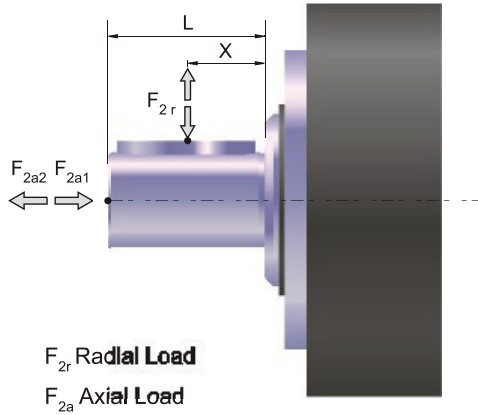
Equipped with *solid uncaged needle roller bearings*, provides maximum contact points to increase stiffness and generates high output torque. *Our in-house plasma nitriding* heat treatment process maintains the tooth surface hardness at *900Hv* for superior wear-resistance and a core hardness at *30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

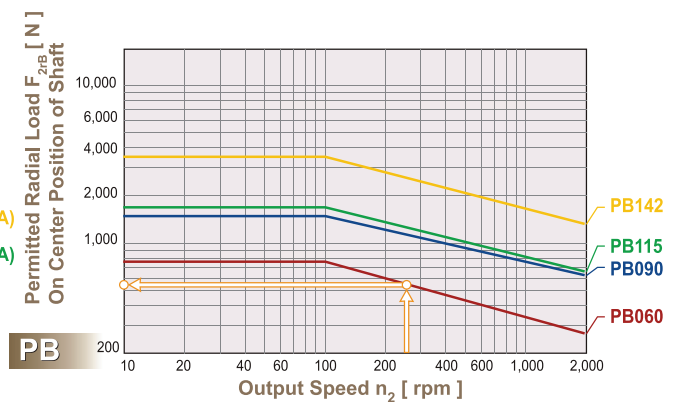
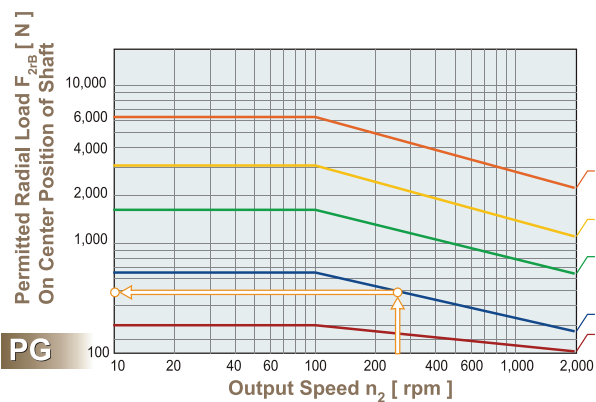
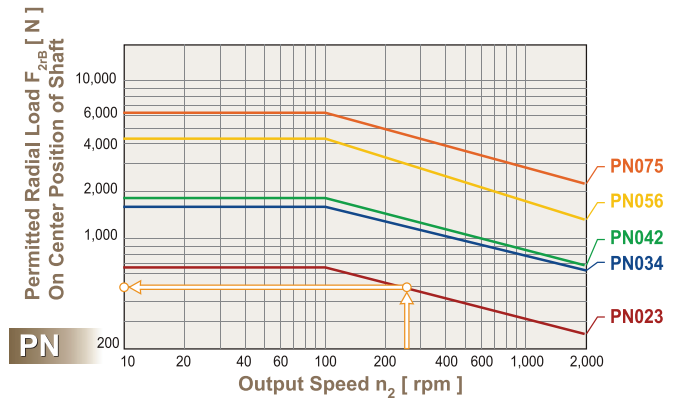
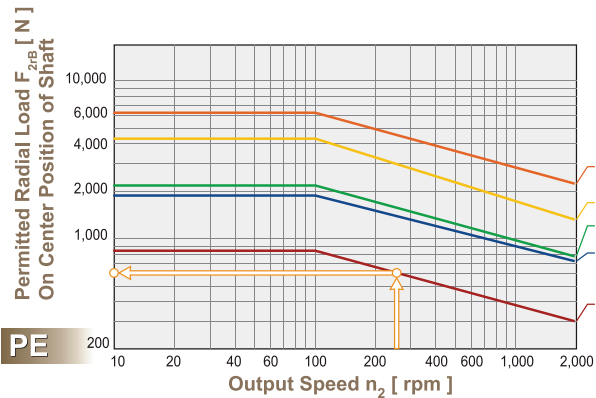


Permitted Radial and Axial Loads on Output Shaft of the Gearbox



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 $X < 1/2 \times L$ or $X > 1/2 \times L$. 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 $X = 1/2 \times L$. 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)

PB Series Specifications

Gearbox Performance

Model No.	Stages	Ratio	PB060	PB090	PB115	PB142		
Nominal Output Torque T_{2N}	1	3	14	39	104	215		
		4	12	31	85	176		
		5	14	39	104	215		
		7	12	33	91	195		
		10	9	26	65	150		
	2	15	14	39	104	215		
		16	12	31	85	176		
		20	12	31	85	176		
		25	14	39	104	215		
		30	14	39	104	215		
		35	12	33	91	195		
		40	12	31	85	176		
		50	14	39	104	215		
		70	12	33	91	195		
	100	9	26	65	150			
	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
	Max. Input Speed n_{1B}	rpm	1,2	3~100	8,000	6,000	6,000	4,800
Backlash*	arcmin	1	3~10	≤ 8	≤ 8	≤ 6	≤ 6	
		2	15~100	≤ 10	≤ 10	≤ 8	≤ 8	
Torsional Rigidity	Nm/arcmin	1,2	3~100	3.7	7.2	15.1	60.5	
Max. Radial Load F_{2rB}^3	N	1,2	3~100	770	1,750	1,890	3,720	
Max. Axial Load F_{2aB}^3	N	1,2	3~100	385	875	945	1,860	
Service Life	hr	1,2	3~100	20,000*				
Efficiency η	%	1	3~10	≥ 97%				
		2	15~100	≥ 94%				
Weight	kg	1	3~10	0.9	2.2	4.3	10.0	
		2	15~100	1.2	3.0	5.7	13.3	
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	

Gearbox Inertia

Model No.	Stages	Ratio	PB060	PB090	PB115	PB142
Mass Moments of Inertia J_1	1	3	0.15	0.53	3.00	10.69
		4	0.15	0.51	2.83	10.08
		5	0.15	0.50	2.80	9.96
		7	0.15	0.50	2.79	9.91
		10	0.15	0.50	2.79	9.89
	2	15	0.15	0.50	2.80	9.96
		16	0.15	0.51	2.83	10.08
		20	0.15	0.50	2.80	9.96
		25	0.15	0.50	2.80	9.96
		30	0.15	0.50	2.80	9.96
		35	0.15	0.50	2.80	9.96
		40	0.15	0.50	2.79	9.89
		50	0.15	0.50	2.79	9.89
		70	0.15	0.50	2.79	9.89
	100	0.15	0.50	2.79	9.89	

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

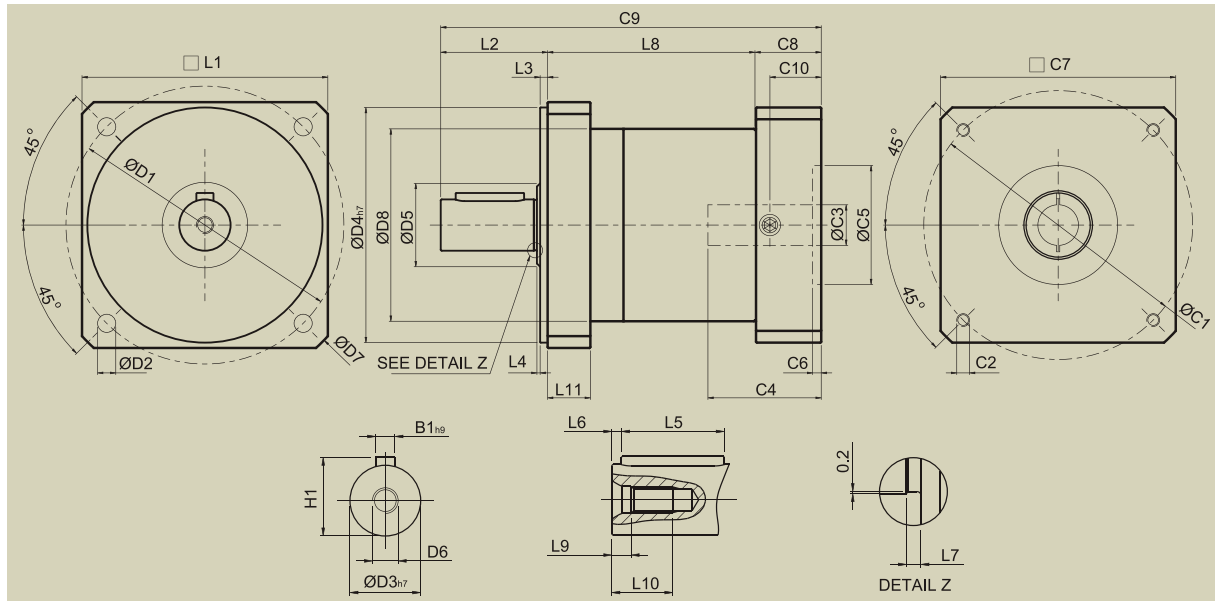
2. $T_{2B} = 60\%$ of T_{2NOT}

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}

PB Series Dimension



[unit: mm]

Dimension	PB060	PB090	PB115	PB142
D1	70	100	130	165
D2	5.5	6.5	9	11
D3 _{h7}	16	20	24	40
D4 _{h7}	50	80	110	130
D5	17	25	40	50
D6	M4X0.7P	M5X0.8P	M8X1.25P	M12X1.75P
D7	80	120	155	190
D8	50	70	90	120
L1	60	90	115	142
L2	25	40	50	80
L3	2.5	3	3.5	3.5
L4	1	1	1.5	1.5
L5	16	28	32	63
L6	3	5	7	8
L7	1	1	1.5	2
L8	1-stage	58	81	97
	2-stage	82.5	114	136.5
L9	4.5	4.8	7.2	10
L10	10	12.5	19	28
L11	13	17	20	25
C1 ⁴	46	70	100	130
C2 ⁴	M4X0.7P	M5X0.8P	M6X1P	M8X1.25P
C3 ⁴	≤ 12	≤ 16	≤ 24	≤ 32
C4 ⁴	30	34	40	50
C5 ⁴	30	50	80	110
C6 ⁴	3.5	8	4	5
C7 ⁴	52	72	92	122
C8 ⁴	21.5	21.5	20	24
C9 ⁴	1-stage	104.5	142.5	167
	2-stage	129	175.5	206.5
C10 ⁴	14.5	15.5	13	16
B1 _{h9}	5	6	8	12
H1	18	22.5	27	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

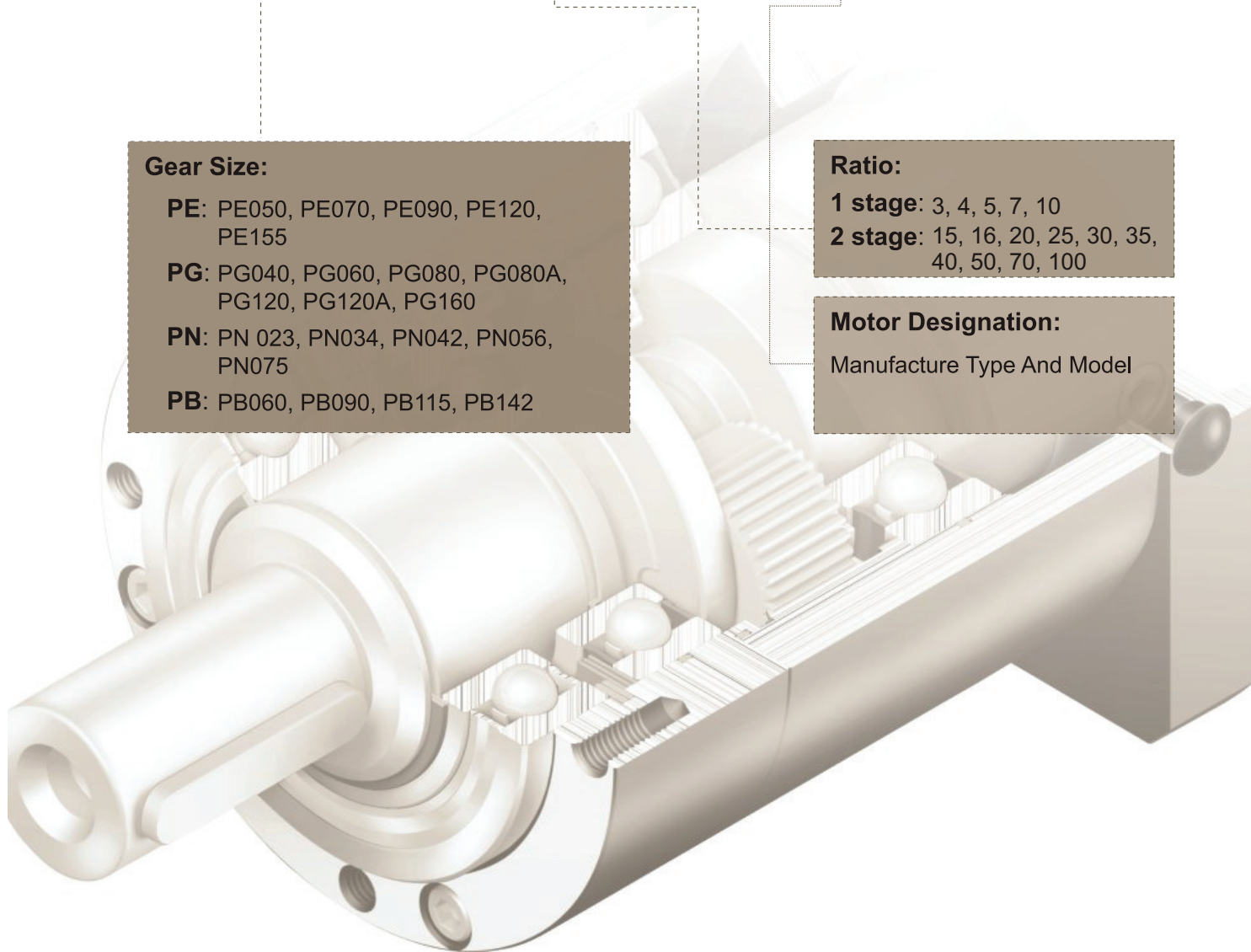
Ratio:

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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