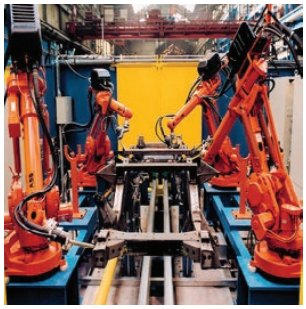
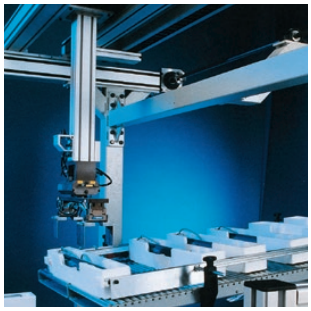










Parker Gearboxes

Planetary Gearheads



Parker

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Economical Planetary Gearheads - PE



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Precision Planetary Gearboxes PS Series



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Filderstadt, Germany
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Wuxi, China
Jangan, Korea
Chennai, India

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Dijon, France

Series	PE 	PS 	GXA 
	page 7	page 17	page 25
	www.parker.com/eme/pe	www.parker.com/eme/ps	www.parker.com/eme/gxa
Description	Economical Planetary Gearboxes	Precision Helical Planetary Gearboxes	Precision ATEX Planetary Gearboxes
Frame size [mm]	40, 60, 90, 115, 155	60, 90, 115, 142	60, 90, 115, 142, 180, 220
Nominal Output Torque [Nm]	up to 460	up to 430	up to 1800
Radial Load [N]	up to 4600	up to 10 000	up to 50 000
Minimum backlash [arcmin]	< 7	< 3	< 3
Maximum input speed [min^{-1}]	up to 18 000	up to 6000	up to 10 000
Ratio	3 to 64	3 to 100	3 to 100
Torsional rigidity [Nm/arcmin]	0.7 to 52	3 to 50	7 to 225

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Economical Planetary Gearheads - PE

Overview

Description

The PE is the perfect economy gearbox. This planetary gearbox was especially designed for all applications where a considerably low backlash is not of vital importance.

Features

- Excellent price/performance ratio
- Input speeds up to 18000 min^{-1}
- Low backlash
- High output torques
- PCS-2 system
- High efficiency (96 %)
- 15 ratios i=3...64
- Low noise
- High quality (ISO 9001)
- Any fitting position possible
- Simple motor fitting
- Lubricated for life
- Direction of rotation equidirectional
- Balanced motor pinion



Technical Characteristics Overview

Features	Unit	Division
Geometry		Planetary Gearheads
Type		Inline
Drives sizes	[mm]	40, 60, 90, 115, 155
Maximum input speed	[min^{-1}]	up to 18000
Nominal torque	[Nm]	460
Radial force	[N]	up to 4600
Service life	[h]	30 000
Minimum backlash	[arcmin]	< 7

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Layout / Features

PE2 / PE3
The Economy gearbox with round output flange



PE4 / PE5
The Economy gearbox with square output flange



PE7
Gearbox for high torque applications (in combination with ETH125 electro cylinder)



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Technical Data

Parameter	Unit	Ratio		PE2	PE3	PE4	PE5	PE7
Nominal torque $T_{nom\ r}$ / Maximum permissible acceleration torque $T_{acc\ r}$ / Emergency stop torque $T_{em\ r}$ (5) $T_{nom\ r}$ / $T_{acc\ r}$ / $T_{em\ r}$ (5) (1)(2)(3)(4)	[Nm]	1 step	3	11/17.5/22.5	28/45/66	85/136/180	115/184/390	-
			4	15/24/30	38/61/88	115/184/240	155/248/520	460/736/920
			5	14/22/36	40/64/80	110/176/220	195/312/500	445/712/890
			7	8.5/13.5/26	25/40/80	65/104/178	135/216/340	-
			8	6/10/27	18/29/80	50/80/190	120/192/380	-
			10	5/8/27	15/24/80	38/61/200	95/152/480	210/336/420
		2 step	9	16.5/26/33	44/70/88	130/208/260	210/336/500	-
			12	20/32/40	44/70/88	120/192/240	260/416/520	-
			15	18/29/36	44/70/88	110/176/220	230/368/500	-
			16	20/32/40	44/70/88	120/192/240	260/416/520	460736/920
			20	20/32/40	44/70/88	120/192/240	260/416/520	460/736/920
			25	18/29/36	40/64/80	110/176/220	230/368/500	445/712/890
			32	20/32/40	44/70/88	120/192/240	260/416/520	-
			40	18/29/36	40/64/80	110/176/220	230/368/500	460/736/920
			50		-	-	-	445/712/890
			64	7.5/12/27	18/29/80	50/80/190	120/192/380	-
Nominal drive speed at $T_{nom\ r}$ $N_{nom\ r}$ (6)	[min^{-1}]	3		5000	4500	3400*	3400*	-
		4		5000	4500	3450*	3500*	1800*
		5		5000	4500	4000*	3500*	2150*
		7		5000	4500	4000	3500	-
		8		5000	4500	4000	3500	-
		9		5000	4500	4000*	3500*	-
		10		5000	4500	4000	3500	3000
		12		5000	4500	4000*	3500*	-
		15		5000	4500	4000	3500*	-
		16		5000	4500	4000	3500*	2900*
		20...64		5000	4500	4000	3500	3000 (* for ratio 20,25)
Maximum mechanical input speed $N_{max\ r}$ (6)	[min^{-1}]	3...64		18000	13000	7000	6500	5500
Maximum radial force Pr_{max} (1) (7)	[N]			160	340	1700	2400	4600
Maximum axial force Pa_{max} (1) (7)	[N]			160	450	2000	2100	6000
Lifetime	[h]			30000 (lifetime lubrication)				
Backlash	[arcmin]	(1 step)		< 15	< 10	< 7	< 7	<8
		(2 step)		< 19	< 12	< 9	< 9	<10

(1) the data refer to an output shaft speed of n_2=100 min^{-1} and application factor KA=1 as well as S1 operating mode for electrical machines and T=30 °C
(2) dependent on the respective motor shaft diameter
(3) with keyway: for dynamic loads
(4) permitted for 30000 revolutions of the output shaft
(5) permitted 1000 times
(6) permitted operating temperatures may not be exceeded.
(7) referred to the center of the output shaft

* at 50 % $T_{nom\ r}$ and S1

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Technical Characteristics

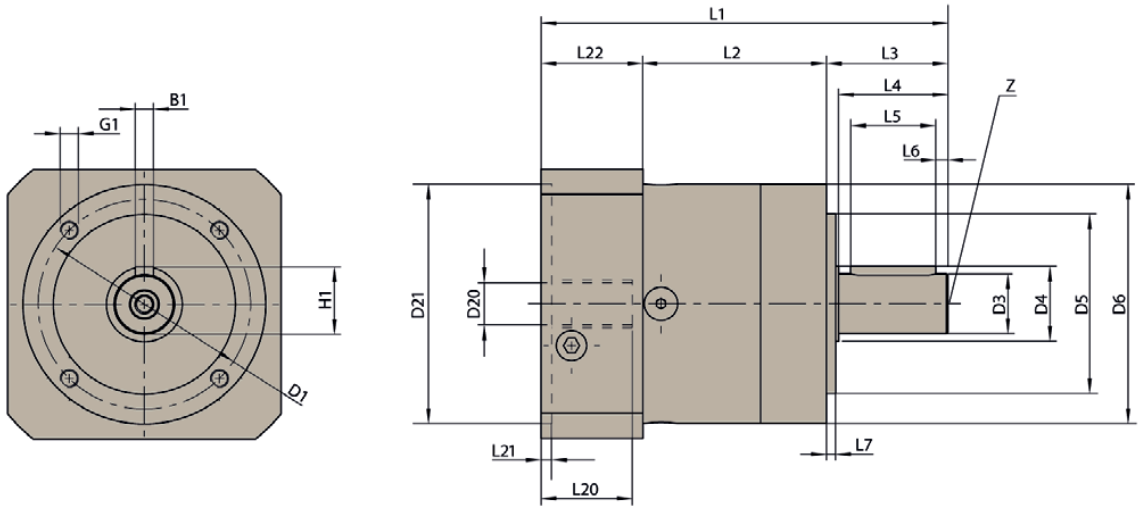
Parameter	Unit	Ratio		PE2	PE3	PE4	PE5	PE7
Efficiency at full load [8]	%	(1 step)		97				
		(2 step)		95				
Noise level at 3000 min^{-1} [9]	[dB (A)]			58	58	60	65	70
Torsional stiffness [8]	[Nm/arcmin]	(1 step)		0.7 - 1	1.7 - 2.3	5.2 - 7	11.3 - 15.2	38.5 - 52
		(2 step)		0.8 - 1	1.9 - 2.3	5.7 - 7	12.3 - 15.2	39.5 - 52
Operating temperature [10]	[°C]			-25 ... +90				
Lubrication				Lifetime lubrication				
Orientation				Any				
Direction of Rotation				Same as input				
Product Enclosure Rating				IP54				
Moment of inertia [11]	[kgmm^2]	1 step	3	3.1	13.5	77	263	-
			4	2.2	9.3	52	179	707.3
			5	1.9	7.8	45	153	604.6
			7	1.8	7.2	42	141	-
			8	1.7	6.5	39	132	-
			10	1.6	6.4	39	130	466.3
		2 step	9	3.0	13.1	74	262	-
			12	2.9	12.7	72	256	-
			15	2.3	7.7	71	253	-
			16	2.2	8.8	50	175	615.6
			20	1.9	7.5	44	150	519.4
			25	1.9	7.5	44	149	514.7
			32	1.7	6.4	39	130	-
			40	1.6	6.4	39	130	445.4
			50		-	-	-	975.4
			64	1.6	6.4	39	130	-
Weight	[kg]	(1 step)			0.9	3.2	6.6	16.5
		(2 step)			1.1	3.7	8.6	20.5

[8] depends on the ratio
[9] Noise level at a distance of 1 m; measured at a drive speed of n_1=3000 min^{-1} without load; i=5
[10] referred to the center of the housing surface
[11] Inertia refers to the input shaft and to the standard motor shaft diameter D20

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Dimensions

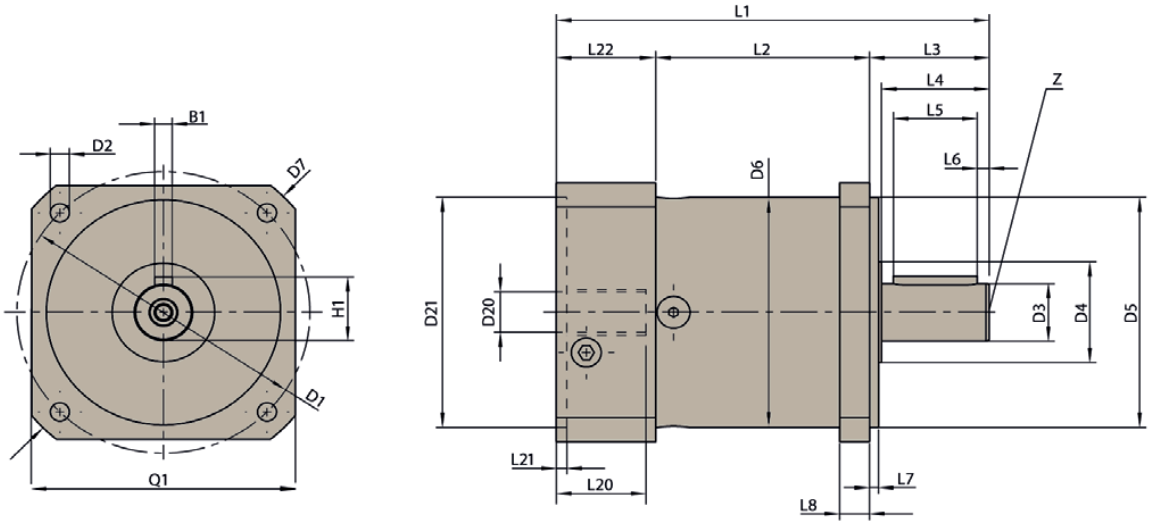
PE2 / PE3



All dimensions in mm			PE2	PE3
B1	Keyway DIN 6885 T1		3	5
D1	Flange bolt circle		34	52
D2	Mounting bore		-	-
D3	Shaft diameter		10	14
D4	Shaft collar		12	17
D5	Centering		26	40
D6	Housing diameter		40	60
D20	Hole		6	9
D21	Centering diameter for motor		30	40
G1	Tapped hole x depth		M4x6	M5x8
H1	Keyway DIN 6885 T1		11.2	16
L1	Overall length	1 step	93.5	106.5
		2 step	106.5	119
L2	Housing length	1 step	39	47
		2 step	52	59.5
L3	Input shaft end		26	35
L4	Shaft end to collar		23	30
L5	Length of keyway		18	25
L6	Distance to shaft end		2.5	2.5
L7	Pilot		2	3
L8	Flange width		-	-
L22	Motor flange length		28.5	24.5
Q1	Flange cross section		-	-
Z	Centering bore DIN332, sheet 2, form DR		M3x9	M5x12



PE4, PE5

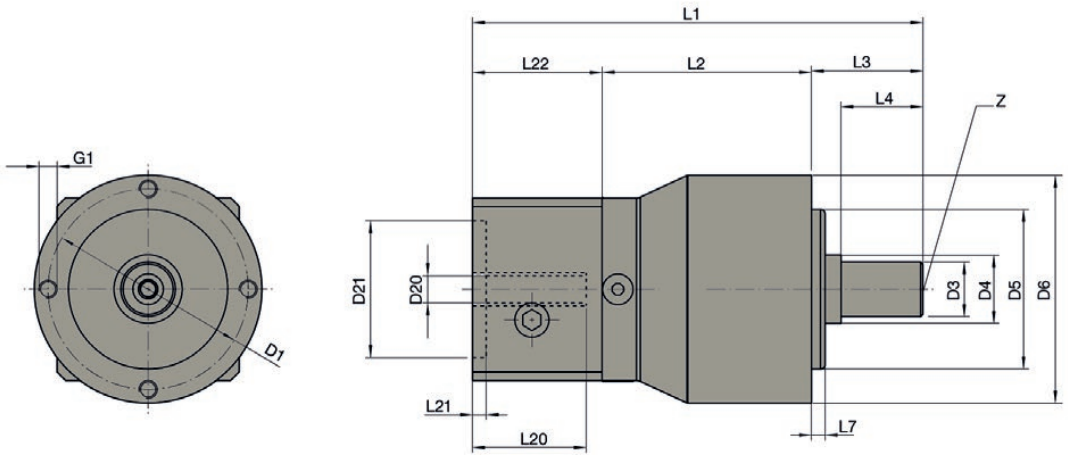


All dimensions in mm			PE4	PE5
B1	Keyway DIN 6885 T1		6	8
D1	Flange bolt circle		100	130
D2	Mounting bore		6.5	8.5
D3	Shaft diameter		20	25
D4	Shaft collar		35	35
D5	Centering		80	110
D6	Housing diameter		80	115
D20	Hole		14	19
D21	Centering diameter for motor		80	95
G1	Tapped hole x depth		-	-
H1	Keyway DIN 6885 T1		22.5	28
L1	Overall length	1 step	145	201.5
		2 step	162.5	229.5
L2	Housing length	1 step	71.5	99
		2 step	89	127
L3	Input shaft end		40	55
L4	Shaft end to collar		36	50
L5	Length of keyway		28	40
L6	Distance to shaft end		4	5
L7	Pilot		3	4
L8	Flange width		10	15
L22	Motor flange length		33.5	47.5
Q1	Flange cross section		90	115
Z	Centering bore DIN332, sheet 2, form DR		M6x16	M10x22



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PE7



All dimensions in mm			PE7
D1	Flange bolt circle		140
D2	Mounting bore		-
D3	Shaft diameter		40
D4	Shaft collar		55
D5	Centering		120
D6	Housing diameter		155
D20	Hole		
D21	Centering diameter for motor		
G1	Tapped hole x depth		M10x20
L1	Overall length	1 step	
		2 step	
L2	Housing length	1 step	100
		2 step	144.5
L3	Input shaft end		97
L4	Shaft end to collar		82
L7	Pilot		8
L8	Flange width		-
L22	Motor flange length		
Q1	Flange cross section		-
Z	Centering bore DIN332, sheet 2, form DR		M16x36



Motor Gearhead Combination

	Motor 1	Motor 2	Motor 3	Order Code (Gearhead)	Mounting thread G3
PE2	SMH40			PE2 XXX 10 M 030/046/06/25	M4
PE3	SMH60/B08/09		MH056/B05/09	**PE3 XXX 10 M 040/063/09/20**	M5
			MH056/B05/11	PE3 XXX 10 M 040/063/11/23	M5
	NX205/NX210			PE3 XXX 10 M 040/063/11/25	M5
	SMH60/B05/11	NX310	MH070/B05/11	**PE3 XXX 10 M 060/075/11/23**	M5
			MH070/B05/14	PE3 XXX 10 M 060/075/14/30	M5
	SY56 (NEMA 23)			PE3 XXX 10 M 038/066/06/21	M5
	SY87 (NEMA 34)			PE3 XXX 10 M 073/098/09/32	M6
PE4	SMH60/B05/11	NX310	MH070/B05/11	**PE4 XXX 10 M 060/075/11/23**	M5
	SMH82/B08/14			**PE4 XXX 10 M 080/100/14/30**	M6
	SMH82/B08/19	NX420/NX430	MH105/B09/19	PE4 XXX 10 M 080/100/19/40	M6
	SMH82/B05/19	SMH100/B05/19	MH105/B05/19	**PE4 XXX 10 M 095/115/19/40**	M8
	SY107 (NEMA 42)			PE4 XXX 10 M 055/125/15/32	M8
	SY87 (NEMA 34)			PE4 XXX 10 M 073/098/09/32	M6
PE5	MH105/B09/19	NX420/NX430		PE5 XXX 10 M 080/100/19/40	M6
	SMH82/B05/19	SMH100/B05/19	MH105/B05/19	**PE5 XXX 10 M 095/115/19/40**	M6
	SMH100/B05/24	SMH115/B09/24	MH105/B05/24	PE5 XXX 10 M 095/115/24/50	M8
	SMH115/B07/24	NX620/NX630	MH105/B06/24	PE5 XXX 10 M 110/130/24/50	M8
	SMH115/B05/24		MH145/B05/24	PE5 XXX 10 M 130/165/24/50	M10
PE7	SMH170/B05/38	MH205/B05/38		PE7 XXX 16 M 180/215/38/80	M12

Bold = Preferred motor gearhead combinations
Only for motors with mounting bores (no mounting thread)
Other mounting possibilities available on request (please contact Parker)

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Order Code

PE Gearheads

	1	2	3	4	5	6	7	8	9
Order example	**PE**	**3**	**003**	**10**	**M**	**038**	**063**	**06**	**20**

1	**Gearhead Type**	
	PE	Economy planetary gearbox
2	**Gearhead Size**	
	2	PE2
	3	PE3
	4	PE4
	5	PE5
	7	PE7
3	**Ratio**	
	003	3
	...	4, 5, 7, 8, 9, 10, 12, 15, 16, 20, 25, 32, 40, 50
	064	64
4	**Output shaft**	
	16	without keyway
	10	with keyway (not possible for PE7)
5	**Motor connection flange**	
	M	
6	**Pilot diameter**	
	038	38 mm
	...	
	180	180mm
7	**Pilot Center Diameter PCD**	
	063	63 mm
	...	
	215	215 mm
8	**Shaft diameter**	
	06	6 mm
	...	
	42	38 mm
9	**Motor shaft length**	
	20	20 mm
	...	
	110	110 mm

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Precision Planetary Gearboxes PS Series

Overview

Description

The Helical Planetary Gearboxes incorporate design solutions to provide superior performance for the most demanding high performance applications.
The PS gearboxes incorporate dual angular contact bearings providing higher radial load capacities while maintaining high input speeds. The construction comprise among others, needle bearings to ensure a longer lifetime. An optimized gearing geometry provides the basis for the universal mounting position. Common mounting kits promote quicker deliveries and ease of mounting to any servo motor.
Mounting to any servo motor is as easy as A-B-C (adapter, bushing, collet).



Features

- **High radial load capacity:**
  Angular contact output bearings
- **Increased service life:**
  Needle bearings
- **Life time lubrication**
- **Mounting Kits:**
  Quicker deliveries and easier mounting
- **High nominal torque and low backlash:**
  Helical planetary gearing
- **High wear resistance:**
  Plasma Nitriting heat treating

Technical Characteristics - Overview

Series	Unit	PS
Gear geometry		Helical Planetary
Type		In-Line
Frame sizes	[mm]	60, 90, 115, 142
Maximum input speed	[min^{-1}]	up to 6000
Nominal torque	[Nm]	27...430
Max. Radial force	[N]	10 000
Life	[h]	20 000
Backlash	[arcmin]	up to <3

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Technical Characteristics

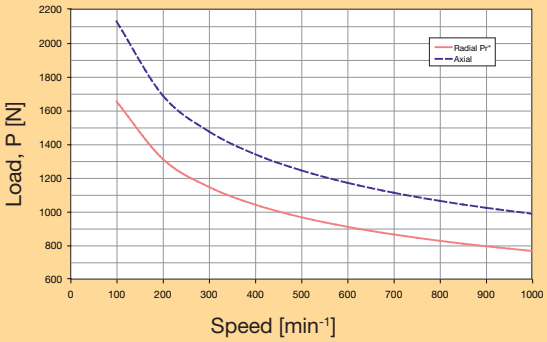
Parameter	Unit	Ratio [8]	PS60	PS90	PS115	PS142
Nominal output torque [1] $T_{nom\ r}$	[Nm]	**3**, 15, 30	27	76	172	300
		4, **5**, 7, **20**, 25, 40, **50**, 70	37	110	230	430
		10, 100	32	93	205	310
Maximum acceleration torque $T_{acc\ r}$	[Nm]	**3**, 15, 30	34	105	225	450
		4, **5**, 7, **20**, 25, 40, **50**, 70	48	123	285	645
		10, 100	37	112	240	465
Emergency stop output torque [2] $T_{em\ r}$	[Nm]	**3**, 15, 30	80	260	600	1100
		4, **5**, 7, **20**, 25, 40, **50**, 70	70	230	500	970
		10, 100	60	200	430	830
Nominal drive speed $N_{nom\ r}$	[min^{-1}]	**3**	3000	2500	2000	1500
		4, **5**	3500	3000	2500	2000
		7, **10**, 15	4000	3500	3000	2500
		20, 25, 30	4500	4000	3500	3000
		40, **50**	4800	4400	3800	3200
		70, 100	5200	4800	4200	3600
Maximum input speed $N_{max\ r}$ [3]	[min^{-1}]	3...100	6000	5500	4500	4000
Maximum radial force Pr_{max} [4]	[N]		1650	4800	7500	10000
Maximum axial load Pa_{max} [5]	[N]		2100	3600	6800	8800
Life	[h]		20 000 (lifetime lubrication)			
Backlash - standard [6]	[arcmin]	3...10 (1 step)	<6	<6	<4	<4
		15...100 (2 step)	<8	<8	<6	<6
Backlash - reduced [6]	[arcmin]	3...10 (1 step)	<4	<4	<3	<3
		15...100 (2 step)	<6	<6	<5	<5
Efficiency at nominal torque	%	3...10	97	97	97	97
		15...100	94	94	94	94
Noise level at 3000 min^{-1} [7]	[db]	3...100	<62	<62	<65	<66
Torsional rigidity	[Nm/arcmin]	3...100	3	12	27	50
Operating temperature	[°C]	3...100	-20...90			
Lubrication		3...100	Lifetime lubrication			
Orientation		3...100	any			
Direction of Rotation		3...100	same as input			
Enclosure rating			IP65			
Rotor inertia			see page 20			
Weight	[kg]	3...10	1.3	3.0	7.0	14.0
		15...100	1.7	5.0	10.0	20.0

[1] At nominal speed $N_{nom\ r}$.
[2] Maximum of 1000 stops.
[3] Cycle mode.
[4] Max. radial load applied to the center of the shaft at 100 min^{-1}
[5] Max. axial load at 100 min^{-1}.
[6] Measured at 2 % of rated torque.
[7] Measure at 1 m.
[8] Gearboxes in bold print - ratios with standard reversing play are on stock. (for PS60 to PS115 only)

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Load on Input Shaft

PS60

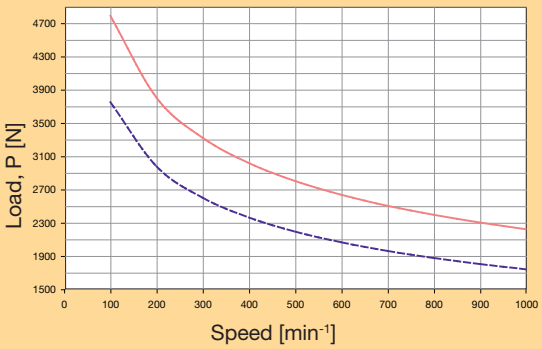


Radial Pr*
Axial

Formulas to calculate radial load (Prx) at any distance "X" from the gearbox mounting surface:

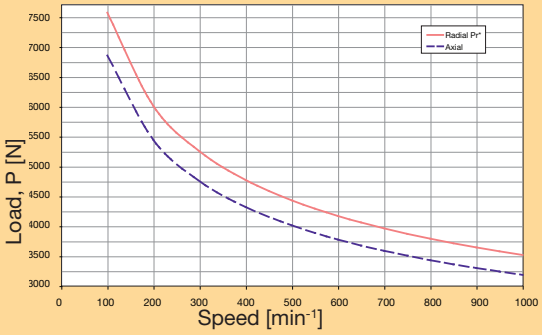
Prx = Pr * 75 mm / (49 mm + X)

PS90



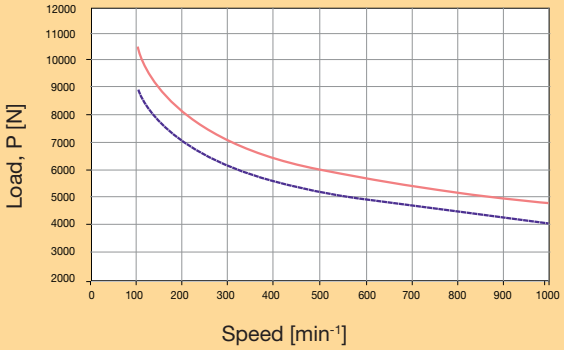
Prx = Pr * 96 mm / (62 mm + X)

PS115



Prx = Pr * 124 mm / (81 mm + X)

PS142

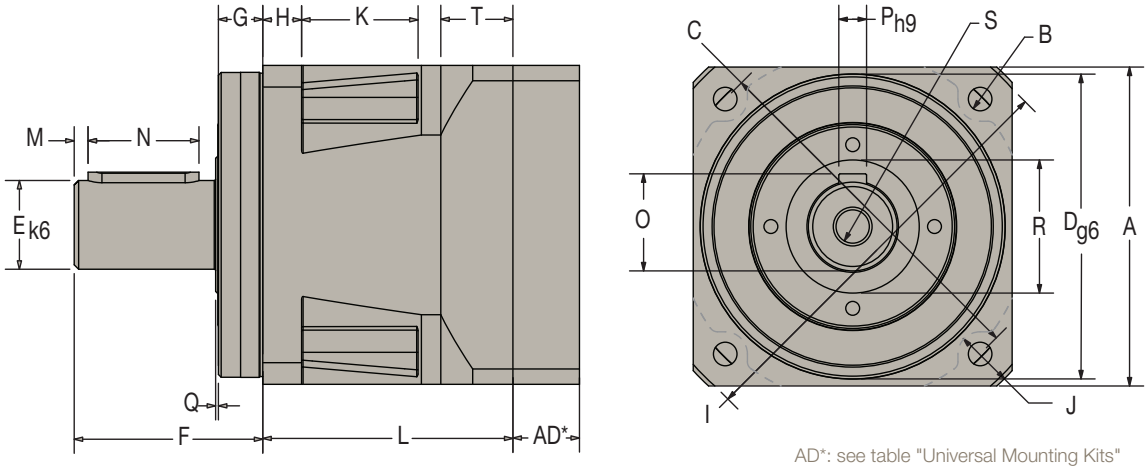


Prx = Pr * 156 mm / (93 + X)

* Radial load applied to center of the shaft.

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Dimensions



AD*: see table "Universal Mounting Kits"

Frame size	All dimensions in mm	PS60	PS90	PS115	PS142
A	Flange cross section	62	90	115	142
B	Fixing bore	5.5	6.5	8.5	11.0
C	Bolt circle	70	100	130	165
D	Motor pilot Ø	50	80	110	130
E	Drive shaftØ	16	22	32	40
F	Drive shaft length	40	52	68	102
G	Motor pilot depth	11	15	16	20
H	Flange width	8	10	14	15
I	Ø Housing	80	116	152	185
J	Housing recess	5	6.5	7.5	10.0
K	Recess length	24	33	42	45
L1	Length single stage	59.8	69.5	90.2	103.7
L2	Length double stage	94.8	113	143.4	170.7
M	Distance from shaft end	2	3	5	5
N	Keyway length	25	32	40	63
O	Key height	18	24.5	35	43
P	Keyway width	5	6	10	12
Q	Collar height	1	1	1.5	2.5
R	Collar Ø	22	35	50	78
S	Center bore (shaft end)	M5x8	M8x16	M12x25	M16x32
T	Width of flange on output side	20.5	20	26	31

Universal Mounting Kits

Adapter length “AD” dimension

Frame size	Motor shaft length	Gearbox adapter length
	[mm]	[mm]
60	16...35 35.1...41	16.5 22.5
90	20...40 40.1...48	20 28.5
115	22...50 50.1...61	24 35
142	26...62 62.1...82	30 50

PS: Rotor Inertia

All rotor inertias refer to the gearbox input

Ratio	Unit	PS60	PS90	PS115	PS142
3	[kgmm²]	25	97	340	1480
4	[kgmm²]	17	67	220	980
5	[kgmm²]	15	51	170	700
7	[kgmm²]	14	41	130	530
10	[kgmm²]	14	37	110	440
15	[kgmm²]	15	52	170	640
20	[kgmm²]	15	51	170	640
25	[kgmm²]	15	51	170	640
30, 40, 50, 70, 100	[kgmm²]	13	37	110	420

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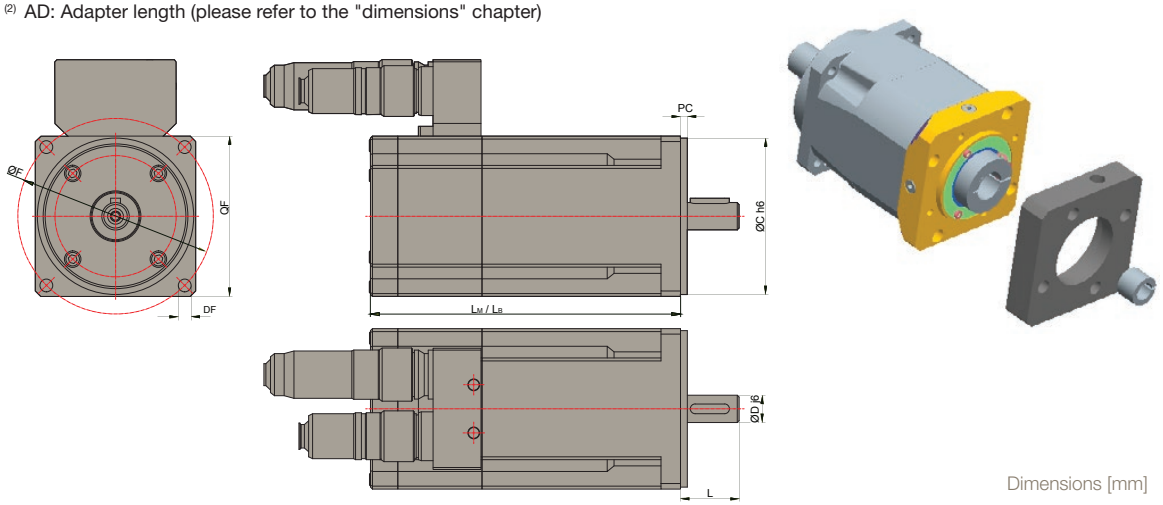
Adapter Flange / Motor - Dimensions (Gear Unit Input Side)

Motor [1]	Flange Type	Motor flange	Flange depth	Bolt circle Ø	Bore Ø	Pilot Ø	Pilot depth	Shaft Ø	Shaft length	Adapter flange		
		QF	PC	F	DF	C	S	D	L	Order No.	Fastening thread	AD [2] (short)
SM_60,###,##,5,11,S	B5	70	7	**75**	6	**60**	**2.5**	**11**	**23**	**MU60-001**	M5	16.5
M_70,###,##,5,11,S	B5	70	7	**75**	6	**60**	**2.5**	**11**	**23**	**MU60-001**	M5	16.5
NX320		56	8.5	**75**	5.5	**60**	**2.5**	**11**	**23**	**MU60-001**	M5	16.5
M_56,###,##,5,9,S	B5	56	6.5	**63**	5.5	**40**	**2.5**	**9**	**20**	**MU60-003**	M5	16.5
SM_60,###,##,8,9,S	B5	60	7	**63**	5.5	**40**	**2.5**	**9**	**20**	**MU60-003**	M5	16.5
SY56#	Nema23	56.5	4.83	**66.67**	5.3	**38.1**	**1.6**	**6.35**	**25.4**	**MU60-005**	M5	16.5
M_56,###,##,5,11,S	B5	56	6.5	**63**	5.5	**40**	**2.5**	**11**	**23**	**MU60-254**	M5	16.5
NX205/210		56	7.2-18	**63**	5.5	**40**	**2.5**	**11**	**25**	**MU60-254**	M5	16.5
NX110		42.5	6	**50**	3.2	**30**	**2.5**	**9**	**25**	**MU60-255**	M3	16.5
SM_82,###,###,8,14,S	B8	82	10	**100**	6.5	**80**	**3.5**	**14**	**30**	**MU60-321**	M6	16.5
SM_82,###,##,8,14,S	B8	82	10	**100**	6.5	**80**	**3.5**	**14**	**30**	**MU90-001**	M6	20
SM_82,###,##,8,19,S	B8	82	10	**100**	6.5	**80**	**3.5**	**19**	**40**	**MU90-085**	M6	20
NX420/430		91.5	10.5	**100**	7	**80**	**3**	**19**	**40**	**MU90-085**	M6	20
M_105,###,##,5,19,S	B5	105	10	**115**	9.5	**95**	**3.5**	**19**	**40**	**MU90-088**	M9	20
SM_100,###,##,5,19,S	B5	100	10	**115**	9	**95**	**3.5**	**19**	**40**	**MU90-088**	M8	20
SM_115,###,##,8,19,S	B8	115	10	**130**	9	**95**	**3.5**	**19**	**40**	**MU90-345**	M8	20
M_105,###,##,5,24,S	B5	105	10	**115**	9.5	**95**	**3.5**	**24**	**50**	**MU115-005**	M8	24
SM_100,###,##,5,24,S	B5	100	10	**115**	9	**95**	**3.5**	**24**	**50**	**MU115-005**	M8	24
SM_115,###,##,8,19,S	B8	115	10	**130**	9	**95**	**3.5**	**19**	**40**	**MU115-006**	M8	24
M_105,###,##,6,24,S	B6	105	10	**130**	9	**110**	**3.5**	**24**	**50**	**MU115-010**	M8	24
SM_115,###,##,7,24,S	B7	130	10	**130**	9	**110**	**3.5**	**24**	**50**	**MU115-010**	M8	24
NX620/630		121	10.5	**130**	9	**110**	**3.5**	**24**	**50**	**MU115-010**	M8	24
SM_82,###,##,8,14,S	B8	82	10	**100**	6.5	**80**	**3.5**	**14**	**30**	**MU115-015**	M6	24
SM_115,###,##,5,24,S	B5	145	10	**165**	11	**130**	**3.5**	**24**	**50**	**MU115-026**	M10	24
SM_142,###,##,5,24,S	B5	145	10	**165**	11	**130**	**3.5**	**24**	**50**	**MU115-026**	M10	24
SM_82,###,##,5,19,S	B5	100	10	**115**	9	**95**	**3.5**	**19**	**40**	**MU115-039**	M8	24
SM_100,###,##,5,19,S	B5	100	10	**115**	9	**95**	**3.5**	**19**	**40**	**MU115-039**	M8	24
SM_82,###,##,8,19,S	B8	82	10	**100**	6.5	**80**	**3.5**	**19**	**40**	**MU115-089**	M6	24
SM_115,###,##,8,24,S	B8	115	10	**130**	9	**95**	**3.5**	**24**	**50**	**MU115-257**	M8	24
M_105,###,##,9,24,S	B9	96	10	**100**	7	**80**	**3.5**	**24**	**50**	**MU115-269**	M6	24
SM_170,###,##, ,38,S	B5	170	8	**215**	14	**180**	**4**	**38**	**80**	**MU142-40410**	M12	53
MH205,###,##, ,38,S	B5	205	8	**215**	14	**180**	**4**	**38**	**80**	**MU142-40410**	M12	53

For motors not shown in the list please contact Parker

[1] MB/SMB: for drives TPDM, SLVDN,
MH/SMH: for drives Compax3, PSD

[2] AD: Adapter length (please refer to the "dimensions" chapter)



Dimensions [mm]

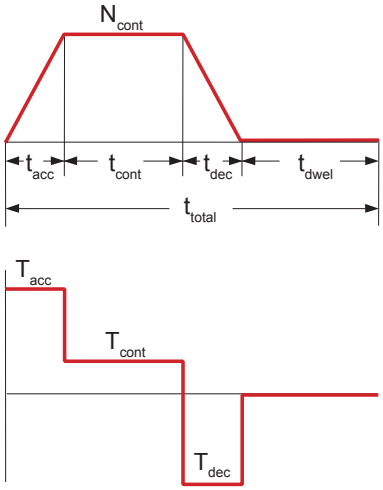
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Gearbox Sizing

Parker has prepared the following procedure to provide a quick method for selecting a gearbox.

1) Application parameters:

- Acceleration time (t_{acc})
- Continuous run time (t_{cont})
- Deceleration time (t_{dec})
- Dwell time (t_{dwel})
- Acceleration torque (T_{acc})
- Continuous torque (T_{cont})
- Deceleration torque (T_{dec})
- Application speed (N_{cont})
- Transmission ratio (i)
- Gearbox nominal torque ($T_{nom\ r}$)
- Max. permissible acceleration torque ($T_{acc\ r}$)
- Percentage of acceleration torque vs. continuous cycle time (t_{total})
- Max. input speed ($N_{max\ r}$)



2) Duty cycle:
Duty cycle = $t_{acc}+t_{cont}+t_{dec}$ / t_{total} x 100 %

If duty cycle is <60 % and ($t_{acc}+t_{cont}+t_{dec}$) is less than 20 minutes, the motion is considered to be intermittent.

If duty cycle is <60 % and ($t_{acc}+t_{cont}+t_{dec}$) is more than 20 minutes, the motion is considered to be continuous.

3) For Cycle mode applies:
Determine T_{acc} % of ($T_{acc}+T_{cont}+T_{dec}$) :
T_{acc} / ($T_{acc}+T_{cont}+T_{dec}$) x 100%

Define the ratio: T_{cont} / T_{acc}

Use the table to select the load factor K.

Compare Accel/Decel torque to the maximum permissible accel torque of the gearbox $T_{acc\ r}$: $T_{acc} < T_{acc\ r}$ x K , if not, please select a more suitable gearbox.

Compare the required maximum speed to the maximum rated speed of the gearbox.
$N_{max} < N_{max\ r\ /\ i}$ i-gearbox ratio)

4) For continuous operation applies:
$T_{nom} < T_{nom\ r}$
$N_{nom} < N_{nom\ r}$ / i

5) Check the Emergency Stop Torque Rating.

6) Verify Radial and Axial Shaft Load of the Application for the selected Gearbox.

Table: Load Factor K

T_{acc} %	0 < T_{cont} / T_{acc} < 0.25	0.25 < T_{cont} / T_{acc} < 0.5
10-15	1.0	1.0
15-20	1.0	0.95
20-25	0.94	0.89
25-30	0.88	0.84
30-35	0.81	0.79
35-40	0.76	0.75
40-45	0.71	0.70
45-50	0.66	0.66

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Order Code

PS Gearboxes

	1	2		3		4	5		6
Order example	**PS**	**60**	**-**	**003**	**-**	**S**	**2**	**/**	**MU60-088**

	1	Gearbox type	
●	**PS**	Gearbox for in-line mounting	
	2		
●	**60**	Flange 60	
●	**90**	Flange 90	
●	**115**	Flange 115	
	142	Flange 142	
	3	**Ratio**	
	003	3	●
	004	4	
	005	5	●
	007	7	
	010	10	●
	015	15	
	020	20	●
	025	25	
	030	30	
	040	40	
	050	50	●
	070	70	
	100	100	
	4	**Reverse play / orientation**	
●	**S**	Standard	
	L	Reduced	
	5	**Series**	
●	**2**	Gen 2 Gearboxes	

● On stock, short delivery times

PS gearboxes generally come with a keyway

	6	Adapter flange / Motor assignment
●	**MU60-001**	SMH60,###,##,5,11,S MH70,###,##,5,11,S NX3
●	**MU60-003**	MH56,###,##,5,9,S SMH60,###,##,8,9,S
	MU60-005	SY56
●	**MU60-254**	MH56,###,##,5,11,S NX2
●	**MU60-255**	NX1
●	**MU60-321**	SMH,###,###,8,14,S
●	**MU90-001**	SMH82,###,##,8,14,S
●	**MU90-085**	SMH82,###,##,8,19,S NX4
●	**MU90-088**	MH105,###,##,5,19,S SMH100,###,##,5,19,S
	MU90-345	SMH115,###,##,8,19,S
●	**MU115-005**	MH105,###,##,5,24,S SMH100,###,##,5,24,S
●	**MU115-006**	SMH115,###,##,8,19,S
●	**MU115-010**	MH105,###,##,6,24,S SMH115,###,##,7,24,S NX6
	MU115-015	SMH82,###,##,8,14,S
●	**MU115-026**	SMH115,###,##,5,24,S SMH142,###,##,5,24,S
●	**MU115-039**	SMH82,###,##,5,19,S SMH100,###,##,5,19,S
●	**MU115-089**	SMH82,###,##,8,19,S
	MU115-257	SMH115,###,##,8,24,S
●	**MU115-269**	MH105,###,##,9,24,S
	MU142-40410	SM_170,###,##,38,S
		MH205,###,##,38,S
	MUxxx-yyy	Additional motors

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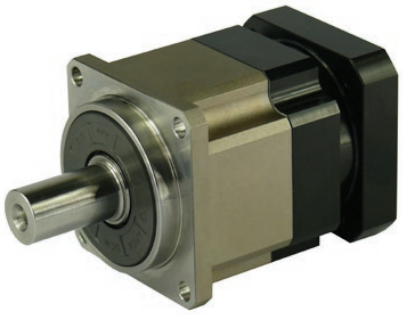
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ATEX Gearboxes GXA Series

Overview

Description

GXA gearbox series has to be associated with the powerful Parker ATEX servomotors ranges for use in hazardous areas. The precision helical gearing design offers smooth and quiet operation for the most demanding high performance applications.
The solid uncaged needle roller bearings provides maximum contact points to increase stiffness and generates high output torque.
In addition the unique motor adapter and bushing module system design allows to obtain a compact structure and a quick and easy mounting of any ATEX certified Parker motor.



Features

- ATEX certify
- Low backlash
- High efficiency
- Easy mounting
- Low noise
- Compact structure
- Helical Gear Design

Technical Characteristics - Overview

Series	Unit	PS
Gear geometry		Helical Gearing
Type		In-Line
Frame sizes	[mm]	60, 90, 115, 142, 180, 220
Maximum input speed	[min^{-1}]	up to 10 000
Nominal torque	[Nm]	40...1800
Radial force	[N]	up to 50 000
Life	[h]	up to 20 000
Backlash	[arcmin]	up to ≤ 3
Efficiency	[%]	up to ≥ 97 %
Category		Equipment Group II Category 2 in accordance with Directive 2014/34/EU
Harmonized standard		EN 1127-1:2012
Other technical standards & specifications applied		EN 13463-1:2009, EN 13463-5:2013, ISO281:2004, ISO286:2013, DIN3960

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Technical Characteristics

Model No.		Stage	Ratio[1]	GX..R02..	GX..R04..	GX..R06..	GX..R07..	GX..R09..	GX..R10..
Nominal Output Torque T_{2N}	[Nm]	1	3	55	130	208	342	588	-
			4	50	140	290	542	1050	-
			5	60	160	330	650	1200	-
			6	55	150	310	600	1100	-
			7	50	140	300	550	1100	-
			8	45	120	260	500	1000	-
			9	40	100	230	450	900	-
			10	40	100	230	450	900	-
		2	15	-	130	208	342	588	-
			20	-	140	290	542	1050	-
			25	-	160	330	650	1200	-
			30	-	150	310	600	1100	-
			35	-	140	300	550	1100	-
			40	-	120	260	500	1000	-
			45	-	100	230	450	900	-
			50	-	160	330	650	1200	-
			60	-	150	310	600	1100	-
			70	-	140	300	550	1100	1800
			80	-	120	260	500	1000	1600
			90	-	100	230	450	900	1500
			100	-	100	230	450	900	1500
Emergency Stop Torque T_{2NOT}[3]	[Nm]	1,2	3~100	3 times of Nominal Output Torque					
Nominal Input Speed n_{1N}	[min^{-1}]	1,2	3~100	5000	4000	4000	3000	3000	2000
Max. Input Speed n_{1B}	[min^{-1}]	1,2	3~100	10 000	8000	8000	6000	6000	4000
Standard Backlash	[arcmin]	1	3~10	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
		2	15~100	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
Reduced Backlash	[arcmin]	1	3~10	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
		2	15~100	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
Torsional Rigidity	[Nm / arcmin]	1,2	3~100	7	14	25	50	145	225
Max. Radial Load F_{2rB}[2]	[N]	1,2	3~100	1530	3250	6700	9400	14500	50000
Max. Axial Load F_{2aB}[2]	[N]	1,2	3~100	765	1625	3350	4700	7250	25000
Lifetime	[h]	1,2	3~100	20 000*					
Efficiency	[%]	1	3~10	≥ 97 %					
		2	15~100	≥ 94 %					
Weight	[kg]	1	3~10	1.3	3.7	7.8	14.5	29	48
		2	15~100	1.5	4.1	9	17.5	33	60
Operating Temp	[°C]	1,2	3~100	-10 to 40 °C					
Lubrication				Synthetic grease					
Degree of Gearbox Protection		1,2	3~100	IP65					
Mounting Position		1,2	3~100	All directions					
Noise Level (n1=3000 min^{-1}, No Load)	[dB(A)]	1,2	3~100	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70

1. Ratio (i=N in / N out)
2. Applied to the output shaft center @ 100 min^{-1}
3. Max. acceleration torque T_{2B} = 60% of T_{2NOT}

*S1 service life 10,000 hrs.

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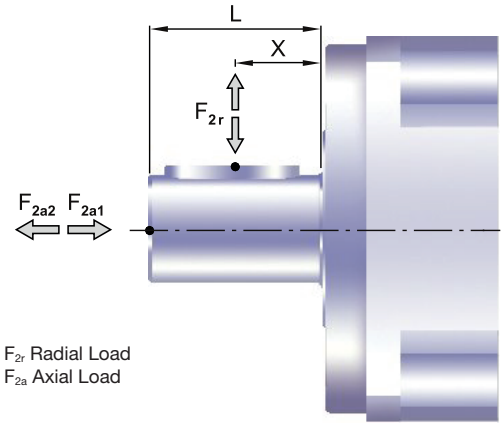
Gearbox Inertia

Model No.	Unit	Stage	Ratio	GX..R02..	GX..R04..	GX..R06..	GX..R07..	GX..R09..	GX..R10..
Mass Moments of inertia J_1	[kgmm²]	1	3	16	61	325	921	2898	-
			4	14	48	274	754	2367	-
			5	13	47	271	742	2329	-
			6	13	45	265	725	2275	-
			7	13	45	262	714	2248	-
			8	13	44	258	707	2259	-
			9	13	44	257	704	2253	-
			10	13	44	257	703	2251	-
		2	15	-	13	47	271	742	-
			20	-	13	47	271	742	-
			25	-	13	47	271	742	-
			30	-	13	47	271	742	-
			35	-	13	47	271	742	-
			40	-	13	47	271	742	-
			45	-	13	47	271	742	-
			50	-	13	44	257	703	-
			60	-	13	44	257	703	-
			70	-	13	44	257	703	2251
			80	-	13	44	257	703	2251
			90	-	13	44	257	703	2251
			100	-	13	44	257	703	2251

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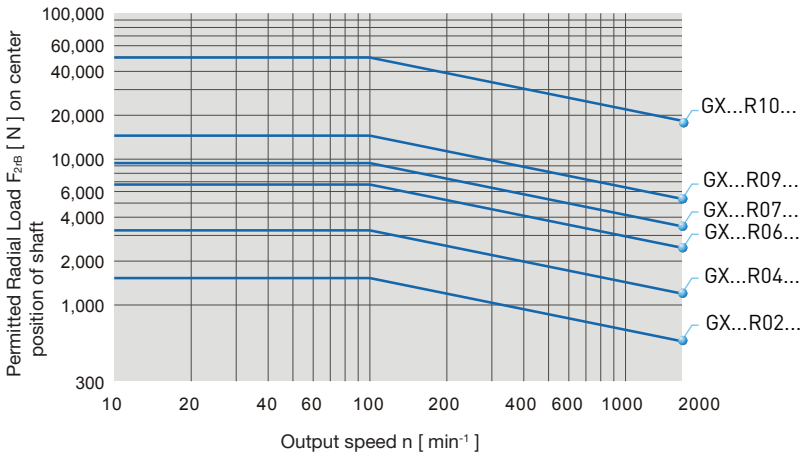
Permitted radial and axial loads on output shaft of the gearbox

The permitted radial and axial loads on output shaft of the gearbox depend on the design of the gearbox supporting bearings.
GXA Series uses the extension straddle oversized ball bearing design
It can take heavy load from both axes.



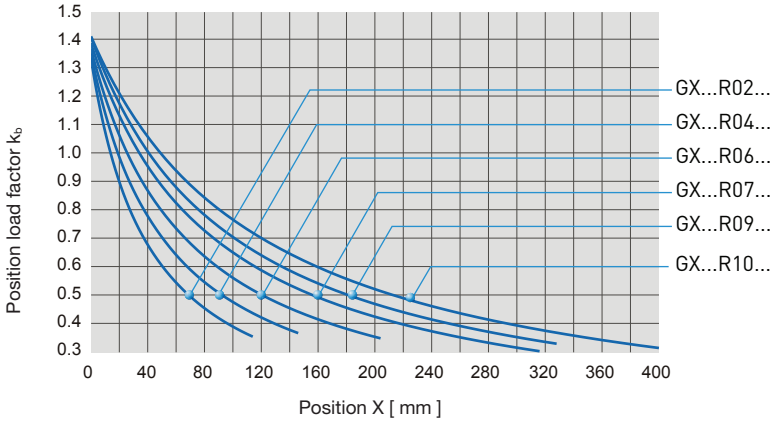
F_{2r} Radial Load
F_{2a} Axial Load

If radial force F_{2r} exert on the center of the output shaft : X=1/2 x L.



The permitted radial load is given on left diagram.

If radial force F2r not exert on the center of the output shaft : X<1/2 x L or X>1/2 x L

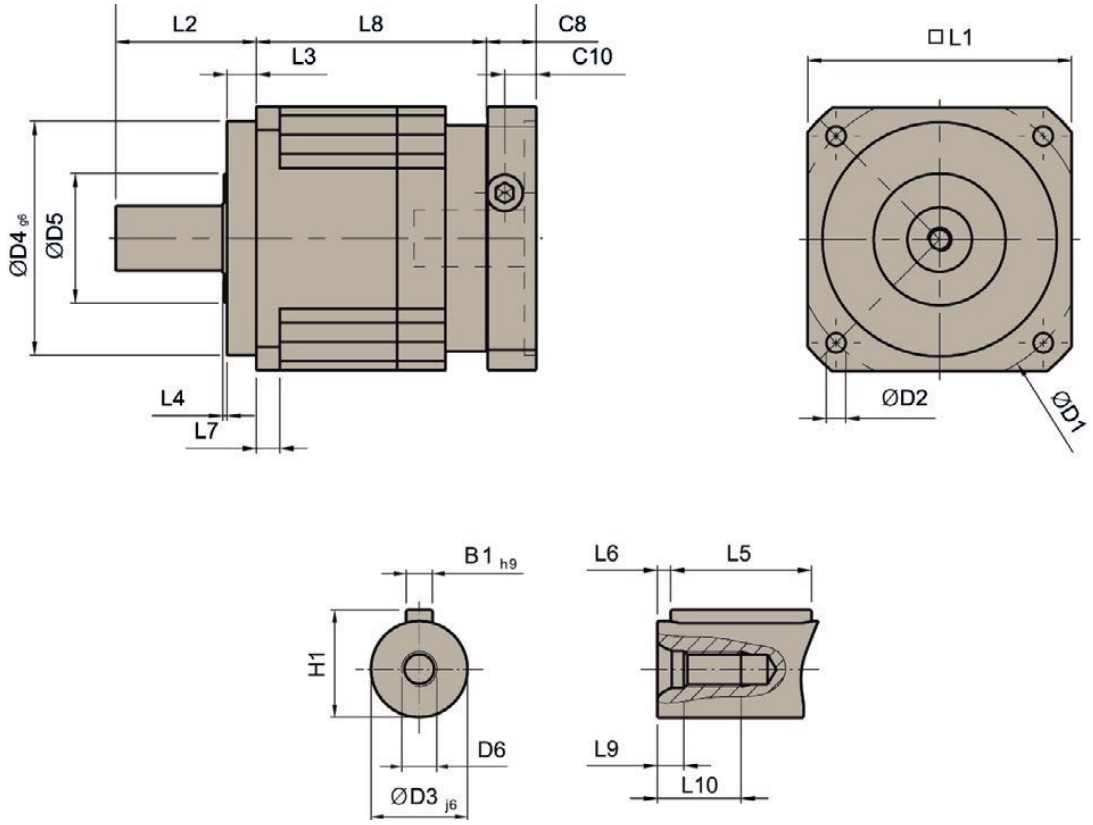


The permitted radial load can be calculated by multiplying the current by the position load factor K_b on the left diagram.

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Dimensions

1 Stage - Ratio i = 3 - 10

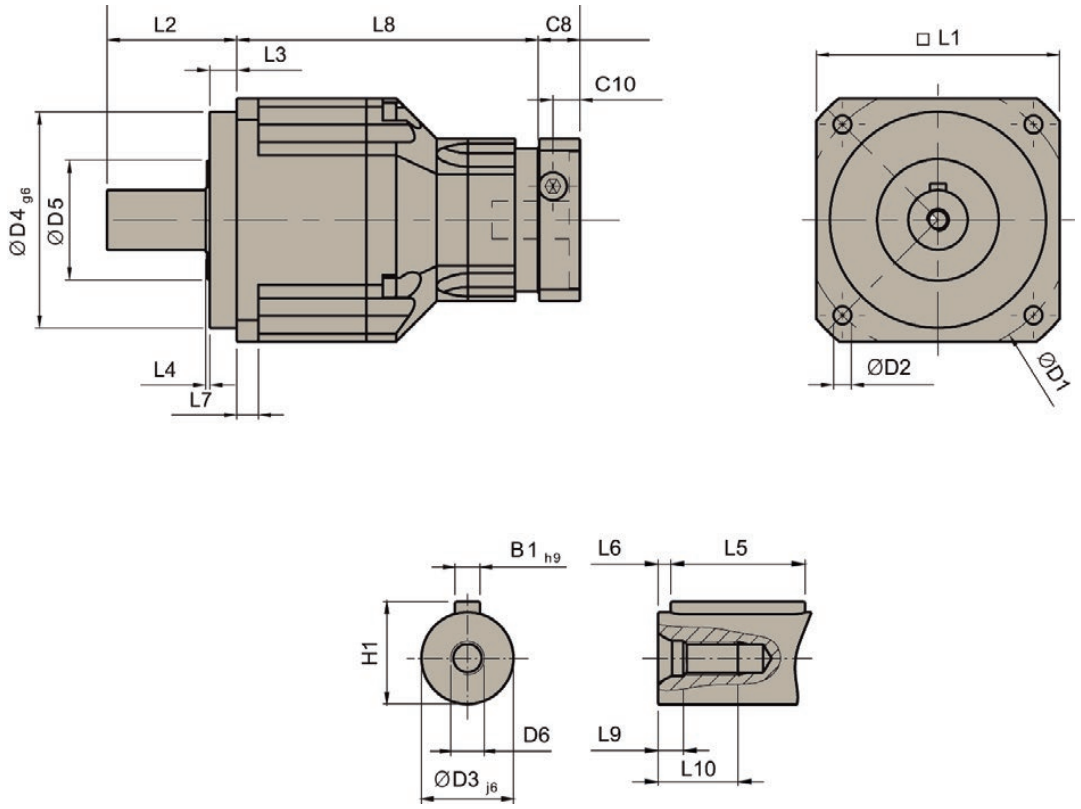


	GX..R02..	GX..R04..	GX..R06..	GX..R07..	GX..R09..
D1	70	100	130	165	215
D2	5.5	6.6	9	11	13
D3 j6	16	22	32	40	55
D4 g6	50	80	110	130	160
D5	45	65	95	75	95
D6	M5 x 0.8	M8 x 1.25	M12 x 1.75	M16 x 0.8	M20 x 2.5
L1	60	90	115	142	180
L2	37	48	65	97	105
L3	7	10	12	15	20
L4	1.5	1.5	2	3	3
L5	25	32	40	63	70
L6	2	3	5	5	6
L7	6	8	10	12	15
L8	61	78.5	102	119.5	154
L9	4.8	7.2	10	12	15
L10	12.5	19	28	36	42
C8 [3]	19	17	19.5	22.5	29
C10 [3]	13.5	10.75	13	15	20.75
B1 h9	5	6	10	12	16
H1	18	24.5	35	43	59

"3. C8~C10 are motor specific dimensions.

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2 Stages - Ratio i = 15 - 100



	GX..R04..	GX..R06..	GX..R07..	GX..R09..	GX..R10..
D1	100	130	165	215	250
D2	6.6	9	11	13	17
D3 j6	22	32	40	55	75
D4 g6	80	110	130	160	180
D5	65	95	75	95	115
D6	M8 x 1.25	M12 x 1.75	M16 x 2	M20 x 2.5	M20 x 2.5
L1	90	115	142	180	220
L2	48	65	97	105	138
L3	10	12	15	20	30
L4	1.5	2	3	3	3
L5	32	40	63	70	90
L6	3	5	5	6	7
L7	8	10	12	15	20
L8	111.5	143.5	176	209.5	248
L9	7.2	10	12	15	15
L10	19	28	36	42	42
C8 [4]	19	17	19.5	22.5	29
C10 [4]	13.5	10.75	13	15	20.75
B1 h9	6	10	12	16	20
H1	24.5	35	43	59	79.5

4. C8~C10 are motor specific dimensions.

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Gearbox Combinations

	Ratio	Motor Size			
		EX3 / EY3	EX4 / EY4	EX6 / EY6	EX8 / EY8
1 stage	3	GXA3N003R0201	GXA4N003R0401	GXA6N003R0601	GXA8N003R0701
	4	GXA3N004R0201	GXA4N004R0401	GXA6N004R0601	GXA8N004R0701
	5	GXA3N005R0201	GXA4N005R0401	GXA6N005R0601	GXA8N005R0701
	6	GXA3N006R0201	GXA4N006R0401	GXA6N006R0601	GXA8N006R0701
	7	GXA3N007R0201	GXA4N007R0401	GXA6N007R0601	GXA8N007R0701
	8	GXA3N008R0201	GXA4N008R0401	GXA6N008R0601	GXA8N008R0701
	9	GXA3N009R0201	GXA4N009R0401	GXA6N009R0601	GXA8N009R0701
	10	GXA3N010R0201	GXA4N010R0401	GXA6N010R601	GXA8N010R0701
2 stages	15	GXA3N015R0401	GXA4N015R0601	GXA6N015R0701	GXA8N015R0901
	20	GXA3N020R0401	GXA4N020R0601	GXA6N020R0701	GXA8N020R0901
	25	GXA3N025R0401	GXA4N025R0601	GXA6N025R0701	GXA8N025R0901
	30	GXA3N030R0401	GXA4N030R0601	GXA6N030R0701	GXA8N030R0901
	35	GXA3N035R0401	GXA4N035R0601	GXA6N035R0701	GXA8N035R0901
	40	GXA3N040R0401	GXA4N040R0601	GXA6N040R0701	GXA8N040R0901
	45	GXA3N045R0401	GXA4N045R0601	GXA6N045R0701	GXA8N045R0901
	50	GXA3N050R0401	GXA4N050R0601	GXA6N050R0701	GXA8N050R0901
	60	GXA3N060R0401	GXA4N060R0601	GXA6N060R0701	GXA8N060R0901
	70		GXA4N070R0601		GXA8N070R0901
		GXA3N070R0401	GXA4N070R0701	GXA6N070R0701	GXA8N070R1001
	80	GXA3N080R0401	GXA4N080R0601	GXA6N080R0701	GXA8N080R0901
			GXA4N080R0701		GXA8N080R1001
	90	GXA3N090R0401	GXA4N090R0601	GXA6N090R0701	GXA8N090R0901
			GXA4N090R0701		GXA8N090R1001
	100	GXA3N100R0401	GXA4N100R0601	GXA6N100R0701	
			GXA4N100R0701		GXA8N100R1001

Motor gearhead possible combination with torque limitation, please consult us at EM-motion@parker.com

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Order Code

GXA Gearboxes

	1	2	3	4	5	6	7
Order example	**GX**	**A**	**3**	**N**	**005**	**R060**	**0**

1	**Gearbox Series**		
	GX	Gearbox for in-line mounting	
2	**Gearbox Type**		
	A	ATEX version	
3	**Motor size association ***		
	3	EX3, EY3 (60/75/11/23)	
	4	EX4, EY4 (80/100/19/40)	
	6	EX6, EY6 (110/130/24/50)	
	8	EX8, EY8 (130/165/32/58)	
4	**Backlash**		
	N	Normal	
	R	Reduced	
5	**Ratio**		
	3 to 10	for GXA	1 stage
	15 to 100	for GXA	2 stages
6	**Gearbox Size ***		
	R020	Size 60	
	R040	Size 90	
	R060	Size 115	
	R070	Size 142	
	R090	Size 180	
	R100	Size 220	
7	**Shaft**		
	0	Smooth shaft	
	1	Keyed shaft	

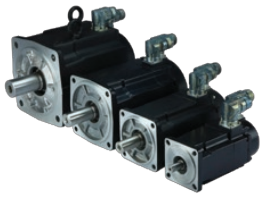
* To find out about possible combinations please refer to the table on page 31.

Explosion proof servo motor

EX Series - Zone 1
www.parker.com/eme/ex



EY Series - Zone 2
www.parker.com/eme/ey



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Aerospace

Key Markets

Aftermarket services
Commercial transports
Engines
General & business aviation
Helicopters
Launch vehicles
Military aircraft
Missiles
Power generation
Regional transports
Unmanned aerial vehicles

Key Products

Control systems & actuation products
Engine systems & components
Fluid conveyance systems & components
Fluid metering, delivery & atomization devices
Fuel systems & components
Fuel tank inerting systems
Hydraulic systems & components
Thermal management
Wheels & brakes



Climate Control

Key Markets

Agriculture
Air conditioning
Construction Machinery
Food & beverage
Industrial machinery
Life sciences
Oil & gas
Precision cooling
Process
Refrigeration
Transportation

Key Products

Accumulators
Advanced actuators
CO_2 controls
Electronic controllers
Filter driers
Hand shut-off valves
Heat exchangers
Hose & fittings
Pressure regulating valves
Refrigerant distributors
Safety relief valves
Smart pumps
Solenoid valves
Thermostatic expansion valves



Electromechanical

Key Markets

Aerospace
Factory automation
Life science & medical
Machine tools
Packaging machinery
Paper machinery
Plastics machinery & converting
Primary metals
Semiconductor & electronics
Textile
Wire & cable

Key Products

AC/DC drives & systems
Electric actuators, gantry robots & slides
Electrohydrostatic actuation systems
Electromechanical actuation systems
Human machine interface
Linear motors
Stepper motors, servo motors, drives & controls
Structural extrusions



Filtration

Key Markets

Aerospace
Food & beverage
Industrial plant & equipment
Life sciences
Marine
Mobile equipment
Oil & gas
Power generation & renewable energy
Process
Transportation
Water Purification

Key Products

Analytical gas generators
Compressed air filters & dryers
Engine air, coolant, fuel & oil filtration systems
Fluid condition monitoring systems
Hydraulic & lubrication filters
Hydrogen, nitrogen & zero air generators
Instrumentation filters
Membrane & fiber filters
Microfiltration
Sterile air filtration
Water desalination & purification filters & systems



Fluid & Gas Handling

Key Markets

Aerial lift
Agriculture
Bulk chemical handling
Construction machinery
Food & beverage
Fuel & gas delivery
Industrial machinery
Life sciences
Marine
Mining
Mobile
Oil & gas
Renewable energy
Transportation

Key Products

Check valves
Connectors for low pressure fluid conveyance
Deep sea umbilicals
Diagnostic equipment
Hose couplings
Industrial hose
Mooring systems & power cables
PTFE hose & tubing
Quick couplings
Rubber & thermoplastic hose
Tube fittings & adapters
Tubing & plastic fittings



Hydraulics

Key Markets

Aerial lift
Agriculture
Alternative energy
Construction machinery
Forestry
Industrial machinery
Machine tools
Marine
Material handling
Mining
Oil & gas
Power generation
Refuse vehicles
Renewable energy
Truck hydraulics
Turf equipment

Key Products

Accumulators
Cartridge valves
Electrohydraulic actuators
Human machine interfaces
Hybrid drives
Hydraulic cylinders
Hydraulic motors & pumps
Hydraulic systems
Hydraulic valves & controls
Hydrostatic steering
Integrated hydraulic circuits
Power take-offs
Power units
Rotary actuators
Sensors



Pneumatics

Key Markets

Aerospace
Conveyor & material handling
Factory automation
Life science & medical
Machine tools
Packaging machinery
Transportation & automotive

Key Products

Air preparation
Brass fittings & valves
Manifolds
Pneumatic accessories
Pneumatic actuators & grippers
Pneumatic valves & controls
Quick disconnects
Rotary actuators
Rubber & thermoplastic hose & couplings
Structural extrusions
Thermoplastic tubing & fittings
Vacuum generators, cups & sensors



Process Control

Key Markets

Alternative fuels
Biopharmaceuticals
Chemical & refining
Food & beverage
Marine & shipbuilding
Medical & dental
Microelectronics
Nuclear Power
Offshore oil exploration
Oil & gas
Pharmaceuticals
Power generation
Pulp & paper
Steel
Water/wastewater

Key Products

Analytical Instruments
Analytical sample conditioning products & systems
Chemical injection fittings & valves
Fluoropolymer chemical delivery fittings, valves & pumps
High purity gas delivery fittings, valves, regulators & digital flow controllers
Industrial mass flow meters/ controllers
Permanent no-weld tube fittings
Precision industrial regulators & flow controllers
Process control double block & bleeds
Process control fittings, valves, regulators & manifold valves



Sealing & Shielding

Key Markets

Aerospace
Chemical processing
Consumer
Fluid power
General industrial
Information technology
Life sciences
Microelectronics
Military
Oil & gas
Power generation
Renewable energy
Telecommunications
Transportation

Key Products

Dynamic seals
Elastomeric o-rings
Electro-medical instrument design & assembly
EMI shielding
Extruded & precision-cut, fabricated elastomeric seals
High temperature metal seals
Homogeneous & inserted elastomeric shapes
Medical device fabrication & assembly
Metal & plastic retained composite seals
Shielded optical windows
Silicone tubing & extrusions
Thermal management
Vibration dampening

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