



aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



PE Series

Economical Planetary Gearheads



ENGINEERING YOUR SUCCESS.



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Economical Planetary Gearheads - PE

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- the global leader in motion and control technologies

A world class player on a local stage

Global Product Design

Parker Hannifin has more than 40 years experience in the design and manufacturing of drives, controls, motors and mechanical products. With dedicated global product development teams, Parker draws on industry-leading technological leadership and experience from engineering teams in Europe, North America and Asia.

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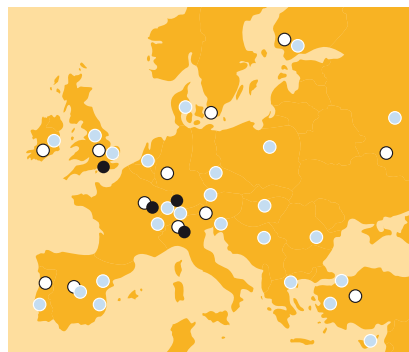
For contact information, please refer to the Sales Offices on the back cover of this document or visit www.parker.com



Milan, Italy



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- Manufacturing
- Parker Sales Offices
- Distributors



Dijon, France

Economical Planetary Gearheads - PE

Overview

Description

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

Features

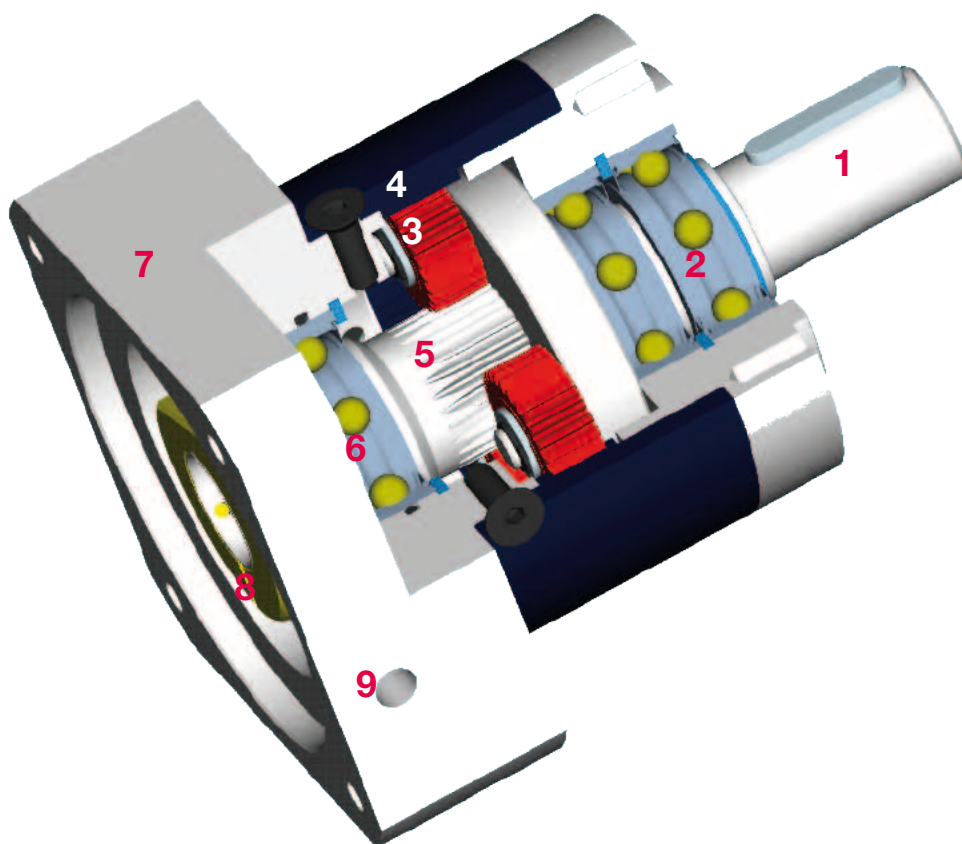
- Excellent price/performance ratio
- Input speeds up to 8000 min⁻¹
- Low backlash
- High output torques
- PCS-2 system
- High efficiency (96 %)
- 22 ratios $i=3...512$
- Low noise
- High quality (ISO 9001)
- Any fitting position possible
- Simple motor fitting
- Life time lubrication
- Direction of rotation equidirectional
- Balanced motor pinion



Technical Characteristics Overview

Features	Unit	Division
Geometry		Planetary Gearheads
Type		Inline
Drives sizes	[mm]	60, 90, 115
Maximum input speed	[min ⁻¹]	up to 13000
Nominal torque	[Nm]	260
Radial force	[N]	up to 2400
Service life	[h]	30000
Backlash	[arcmin]	< 8

Layout / Features



1 Output shaft

The input shaft is case-hardened and offers a very good torsional rigidity.

2 Output shaft bearing

Double ball bearings distribute the load evenly which results in a high radial and axial load bearing capacity.

3 Planet wheel

Case-hardened and precision ground.

4 Annulus gear in the housing

Case-hardened and precision ground.

5 Sun gear

Case-hardened and precision ground.

6 Sun gear bearing

The integral sun gear allows precise mounting within a few minutes. The inside of the gearhead is protected against contamination.

7 Mounting flanges

The gearheads are available with motor flanges for a variety of common servo and stepper motors.

8 Clamping bushing

Consists of clamp collar and clamp screw.

The proven clamped joint for the motor shaft with even pressure distribution ensures safe torque transmission even at high loads.

9 Fitting aperture

Easy access for tightening and loosening the clamped joint.

Technical Data

Parameter	Unit	Ratio	PE3	PE4	PE5	
Nominal torque $T_{nom r} /$ Maximum permissible acceleration torque $T_{acc r}$ $T_{nom r} / T_{acc r}$ (1)(2)(3)(4)	[Nm]	1 step	3	28/45	85/136	115/184
			4	38/61	115/184	155/248
			5	40/64	110/176	195/312
			8	18/29	50/80	120/192
		2 step	9	44/70	130/208	210/336
			12	44/70	120/192	260/416
			15	44/70	110/176	230/368
			16	44/70	120/192	260/416
			20	44/70	120/192	260/416
			25	40/64	110/176	230/368
			32	44/70	120/192	260/416
			40	40/64	110/176	230/368
		3 step	64	18/29	50/80	120/192
			60	44/70	110/176	260/416
			80	44/70	120/192	260/416
			100	44/70	120/192	260/416
			120	44/70	110/176	230/368
160	44/70		120/192	260/416		
200	40/64		110/176	230/368		
256	44/70		120/192	260/416		
320	40/64		110/176	230/368		
512	18/29		50/80	120/192		
Emergency off torque $T_{em r}$ ⁽⁵⁾	[Nm]	Double nominal torque $T_{nom r}$				
Nominal drive speed at 100 % $T_{nom r}$ $N_{nom r}$ ⁽⁶⁾	[min ⁻¹]	3	4450	2400	2550	
		4	4400	2300	2500	
		5	4500	2800	2500	
		8	4500	4000	3500	
		9	4500	2900	2650	
		12	4500	4000	2650	
		15	4500	3350	3200	
		16	4500	4000	3100	
		20...512	4500	4000	3500	
Maximum drive speed $N_{max r}$ ⁽⁶⁾	[min ⁻¹]	3...512	13 000	7000	6500	
Maximum radial force $P_{r max}$ ^{(1) (7)}	[N]		340	1700	2400	
Maximum axial force $P_{a max}$ ^{(1) (7)}	[N]		450	2000	2100	
Service life	[h]	30 000 (lifetime lubrication)				
Backlash	[arcmin]	(1 step)	< 12	< 8	< 8	
		(2 step)	< 15	< 12	< 12	
		(3 step)	< 18	< 14	< 14	

⁽¹⁾ the data refer to an output shaft speed of $n_2=100 \text{ min}^{-1}$ and application factor $KA=1$ as well as S1 operating mode for electrical machines and $T=30 \text{ °C}$

⁽²⁾ dependent on the respective motor shaft diameter

⁽³⁾ with keyway; for dynamic loads

⁽⁴⁾ permitted for 30 000 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

Parameter	Unit	Ratio	PE3	PE4	PE5	
Efficiency at nominal torque ⁽⁸⁾	%	(1 step)	96			
		(2 step)	94			
		(3 step)	90			
Noise level at 3000 min⁻¹ ⁽⁹⁾	[dB (A)]		58	60	65	
Torsional rigidity	[Nm/arcmin]	(1 step)	2.3	6	12	
		(2 step)	2.5	6.5	13	
		(3 step)	2.5	6.3	12	
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	13.5	77	263
			4	9.3	52	179
			5	7.8	45	153
			8	6.5	39	132
		2 step	9	13.1	74	262
			12	12.7	72	256
			15	7.7	71	253
			16	8.8	50	175
			20	7.5	44	150
			25	7.5	44	149
			32	6.4	39	130
			40	6.4	39	130
		3 step	64	6.4	39	130
			60	7.6	51	257
			80	7.5	50	150
			100	7.5	44	149
			120	6.4	70	250
			160	6.4	39	130
200	6.4		39	130		
256	6.4		39	130		
320	6.4	39	130			
512	6.4	39	130			
Weight	[kg]	(1 step)	0.9	3.2	6.6	
		(2 step)	1.1	3.7	8.6	
		(3 step)	1.3	4.2	10.6	

⁽⁸⁾ depends on the ratio, $n_2=100 \text{ min}^{-1}$

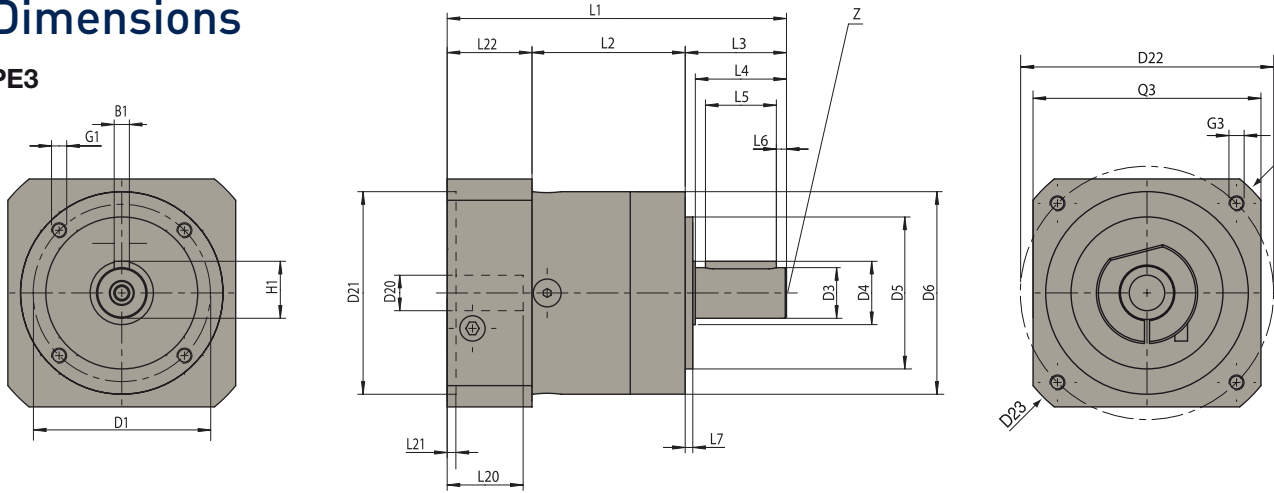
⁽⁹⁾ Noise level at a distance of 1 m; measured at a drive speed of $n_1=3000 \text{ min}^{-1}$ without load; $i=5$

⁽¹⁰⁾ referred to the center of the housing surface

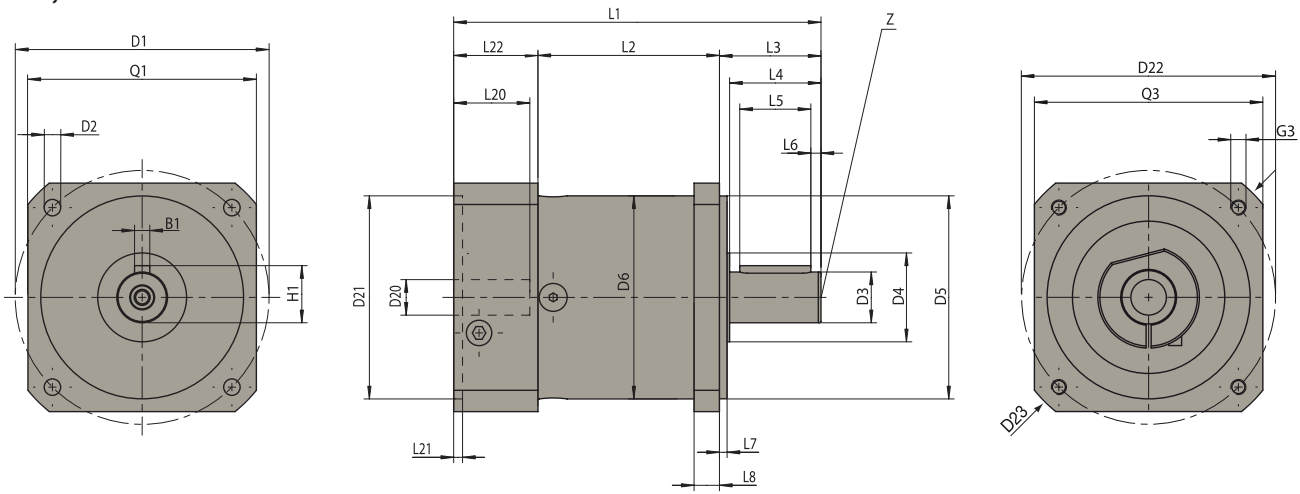
⁽¹¹⁾ Inertia refers to the input shaft and to the standard motor shaft diameter D20

Dimensions

PE3



PE4, PE5



		Frame size		
		PE3	PE4	PE5
All dimensions in mm				
B1	Keyway DIN 6885 T1	5	6	8
D1	Flange bolt circle	52	100	130
D2	Mounting bore	-	6.5	8.5
D3	Shaft diameter	14	20	25
D4	Shaft collar	17	35	35
D5	Centering	40	80	110
D6	Housing diameter	60	80	115
D20	Hole	9	14	19
D21	Centering diameter for motor	40	80	95
D22	Bolt circle	63	100	115
D23	Diagonal dimension	80	115	145
G1	Tapped hole x depth	M5x8	-	-
G3	Tapped hole x depth	Depending on the adapter flange (see table with the motor-gearbox combinations)		
H1	Keyway DIN 6885 T1	16	22.5	28

			Frame size		
			PE3	PE4	PE5
All dimensions in mm					
L1	Overall length	1 step	106.5	145	201.5
		2 step	119	162.5	229.5
		3 step	131.5	180	257
L2	Housing length	1 step	47	71.5	99
		2 step	59.5	89	127
		3 step	72	106.5	154.5
L3	Input shaft end		35	40	55
L4	Shaft end to collar		30	36	50
L5	Length of keyway		25	28	40
L6	Distance to shaft end		2.5	4	5
L7	Pilot		3	3	4
L8	Flange width		-	10	15
L20	Shaft length motor		23	30	40
L21	Centering drive		2.5	3.5	3.5
L22	Motor flange length		24.5	33.5	47.5
Q1	Flange cross section		-	90	115
Q3	Flange cross section		60	90	115
Z	Centering bore DIN332, sheet 2, form DR		M5x12	M6x16	M10x22

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	3	PE3
	4	PE4
	5	PE5
3 Ratio	003	3
	...	
	512	512
4 Output shaft	10	Input shaft with keyway
5 Motor connection flange	M	
6 Pilot diameter	038	38 mm
	...	
	130	130mm
7 Distance between holes	063	63 mm
	...	
	165	165 mm
8 Shaft diameter	06	6 mm
	...	
	24	24 mm
9 Motor shaft length	20	20 mm
	...	
	50	50 mm

Motor Gearhead Combination

	Motor 1	Motor 2	Motor 3	Order Code (Gearhead)	Mounting thread G3
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
	SMH60/B05/11		MH070/B05/11	PE3 XXX 10 M 060/075/11/23	M5
			MH070/B05/14	PE3 XXX 10 M 060/075/14/23	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		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		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			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		MH105/B05/24	PE5 XXX 10 M 095/115/24/50	M8
	SMH115/B05/24		MH105/B06/24	PE5 XXX 10 M 110/130/24/50	M8
			MH145/B05/24	PE5 XXX 10 M 130/165/24/50	M10

Bold = Preferred motor gearhead combinations
Only for motors with mounting bores (no mounting thread)

Parker's Motion & Control Technologies

At Parker, we're guided by a relentless drive to help our customers become more productive and achieve higher levels of profitability by engineering the best systems for their requirements. It means looking at customer applications from many angles to find new ways to create value. Whatever the motion and control technology need, Parker has the experience, breadth of product and global reach to consistently deliver. No company knows more about motion and control technology than Parker. For further info call 00800 27 27 5374.



AEROSPACE

Key Markets

- Aircraft engines
- Business & general aviation
- Commercial transports
- Land-based weapons systems
- Military aircraft
- Missiles & launch vehicles
- Regional transports
- Unmanned aerial vehicles

Key Products

- Flight control systems & components
- Fluid conveyance systems
- Fluid metering delivery & atomization devices
- Fuel systems & components
- Hydraulic systems & components
- Inert nitrogen generating systems
- Pneumatic systems & components
- Wheels & brakes



CLIMATE CONTROL

Key Markets

- Agriculture
- Air conditioning
- Food, beverage & dairy
- Life sciences & medical
- Precision cooling
- Processing
- Transportation

Key Products

- CO₂ controls
- Electronic controllers
- Filter driers
- Hand shut-off valves
- Hose & fittings
- Pressure regulating valves
- Refrigerant distributors
- Safety relief valves
- Solenoid valves
- Thermostatic expansion valves



ELECTROMECHANICAL

Key Markets

- Aerospace
- Factory automation
- Food & beverage
- 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
- Controllers
- Gantry robots
- Gearheads
- Human machine interfaces
- Industrial PCs
- Inverters
- Linear motors, slides and stages
- Precision stages
- Stepper motors
- Servo motors, drives & controls
- Structural extrusions



FILTRATION

Key Markets

- Food & beverage
- Industrial machinery
- Life sciences
- Marine
- Mobile equipment
- Oil & gas
- Power generation
- Process
- Transportation

Key Products

- Analytical gas generators
- Compressed air & gas filters
- Condition monitoring
- Engine air, fuel & oil filtration & systems
- Hydraulic, lubrication & coolant filters
- Process, chemical, water & microfiltration filters
- Nitrogen, hydrogen & zero air generators



FLUID & GAS HANDLING

Key Markets

- Aerospace
- Agriculture
- Bulk chemical handling
- Construction machinery
- Food & beverage
- Fuel & gas delivery
- Industrial machinery
- Mobile
- Oil & gas
- Transportation
- Welding

Key Products

- Brass fittings & valves
- Diagnostic equipment
- Fluid conveyance systems
- Industrial hose
- PTFE & PFA hose, tubing & plastic fittings
- Rubber & thermoplastic hose & couplings
- Tube fittings & adapters
- Quick disconnects



HYDRAULICS

Key Markets

- Aerospace
- Aerial lift
- Agriculture
- Construction machinery
- Forestry
- Industrial machinery
- Mining
- Oil & gas
- Power generation & energy
- Truck hydraulics

Key Products

- Diagnostic equipment
- Hydraulic cylinders & accumulators
- Hydraulic motors & pumps
- Hydraulic systems
- Hydraulic valves & controls
- Power take-offs
- Rubber & thermoplastic hose & couplings
- Tube fittings & adapters
- Quick disconnects



PNEUMATICS

Key Markets

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

Key Products

- Air preparation
- Compact cylinders
- Field bus valve systems
- Grippers
- Guided cylinders
- Manifolds
- Miniature fluids
- Pneumatic accessories
- Pneumatic actuators & grippers
- Pneumatic valves and controls
- Rodless cylinders
- Rotary actuators
- Tie rod cylinders
- Vacuum generators, cups & sensors



PROCESS CONTROL

Key Markets

- Chemical & refining
- Food, beverage & dairy
- Medical & dental
- Microelectronics
- Oil & gas
- Power generation

Key Products

- Analytical sample conditioning products & systems
- Fluoropolymer chemical delivery fittings, valves & pumps
- High purity gas delivery fittings, valves & regulators
- Instrumentation fittings, valves & regulators
- Medium pressure fittings & valves
- Process control manifolds



SEALING & SHIELDING

Key Markets

- Aerospace
- Chemical processing
- Consumer
- Energy, oil & gas
- Fluid power
- General industrial
- Information technology
- Life sciences
- Military
- Semiconductor
- Telecommunications
- Transportation

Key Products

- Dynamic seals
- Elastomeric o-rings
- EMI shielding
- Extruded & precision-cut, fabricated elastomeric seals
- Homogeneous & inserted elastomeric shapes
- High temperature metal seals
- Metal & plastic retained composite seals
- Thermal management

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192-753013N2

October 2011



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