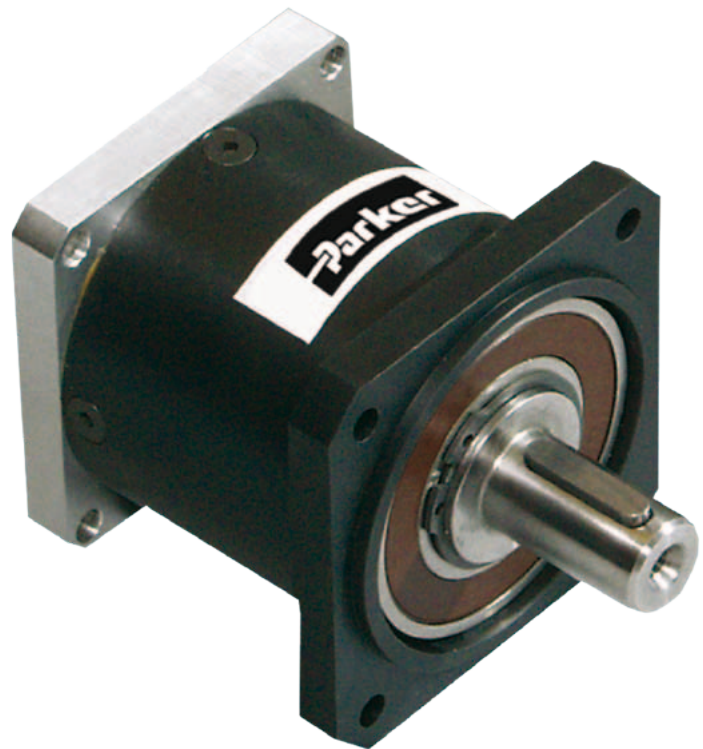
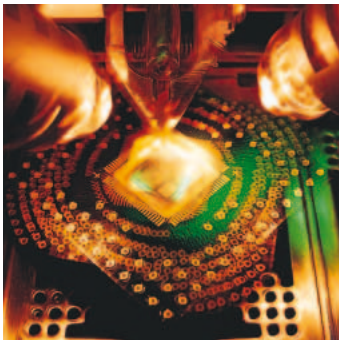




aerospace  
climate control  
electromechanical  
filtration  
fluid & gas handling  
hydraulics  
pneumatics  
process control  
sealing & shielding



## PE Series

Economical Planetary Gearheads



ENGINEERING YOUR SUCCESS.



**WARNING – USER RESPONSIBILITY**

**FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.**

- This document and other information from Parker-Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.
- The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.
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## Economical Planetary Gearheads - PE

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<b>Order Code.....</b>	<b>10</b>

# Parker Hannifin

- 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.

## Local Application Expertise

Parker has local engineering resources committed to adapting and applying our current products and technologies to best fit our customers' needs.

## Manufacturing to Meet Our Customers' Needs

Parker is committed to meeting the increasing service demands that our customers require to succeed in the global industrial market. Parker's manufacturing teams seek continuous improvement through the implementation of lean manufacturing methods throughout the process. We measure ourselves on meeting our customers' expectations of quality and delivery, not just our own. In order to meet these expectations, Parker operates and continues to invest in our manufacturing facilities in Europe, North America and Asia.

## Worldwide Manufacturing Locations

### Europe

Littlehampton, United Kingdom  
Dijon, France  
Offenburg, Germany  
Milan, Italy

### Asia

Shanghai, China  
Chennai, India

### North America

Rohnert Park, California  
Irwin, Pennsylvania  
Wadsworth, Ohio  
Charlotte, North Carolina  
New Ulm, Minnesota



Offenburg, Germany

## Local Manufacturing and Support in Europe

Parker provides sales assistance and local technical support through a network of dedicated sales teams and authorized technical distributors throughout Europe.

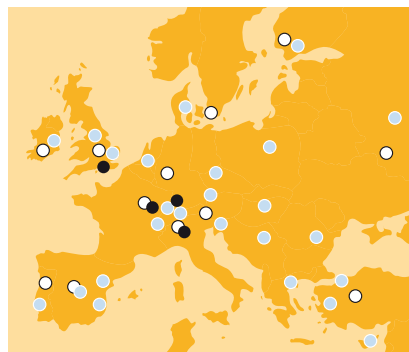
For contact information, please refer to the Sales Offices on the back cover of this document or visit [www.parker.com](http://www.parker.com)



Milan, Italy



Littlehampton, UK



- 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

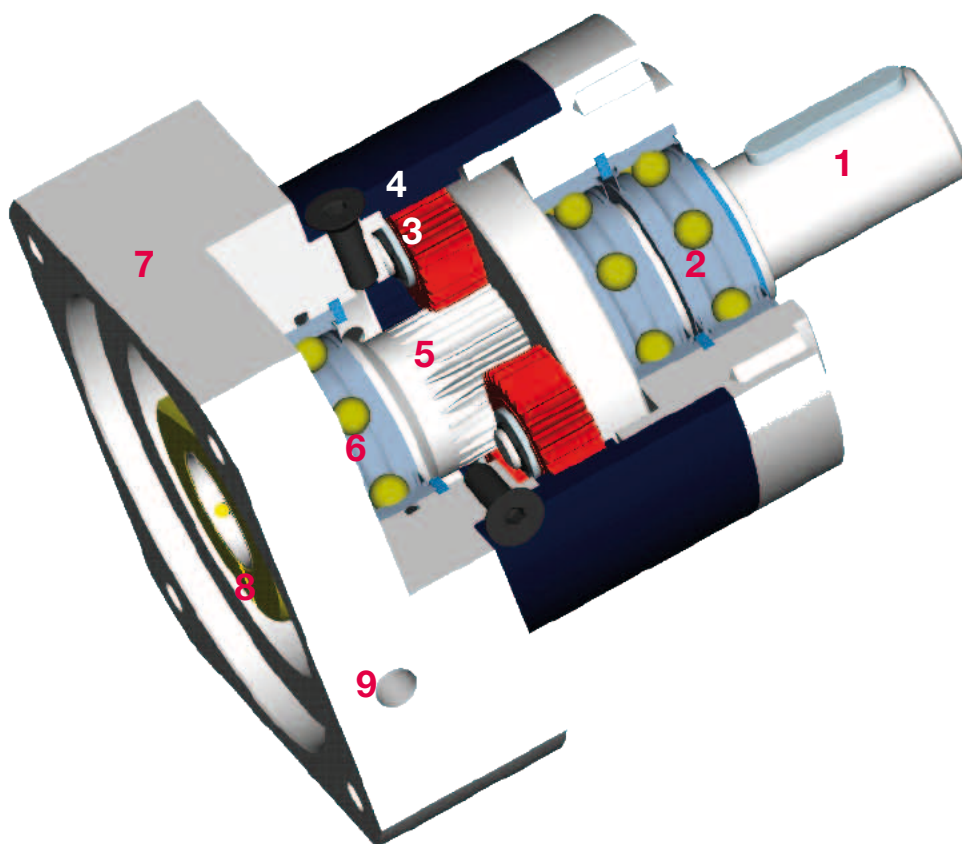
- Excellent price/performance ratio
- Input speeds up to 8000 min<sup>-1</sup>
- Low backlash
- High output torques
- PCS-2 system
- High efficiency (96 %)
- 22 ratios  $i=3...512$
- Low noise
- High quality (ISO 9001)
- Any fitting position possible
- Simple motor fitting
- Life time lubrication
- Direction 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 <sup>-1</sup> ]	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	
<b>Nominal torque</b> $T_{nom r} /$ <b>Maximum permissible acceleration torque <math>T_{acc r}</math></b>  $T_{nom r} / T_{acc r}$ (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		
<b>Emergency off torque <math>T_{em r}</math> <sup>(5)</sup></b>	[Nm]	Double nominal torque $T_{nom r}$				
<b>Nominal drive speed at 100 %</b> $T_{nom r}$ $N_{nom r}$ <sup>(6)</sup>	[min <sup>-1</sup> ]	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	
<b>Maximum drive speed</b> $N_{max r}$ <sup>(6)</sup>	[min <sup>-1</sup> ]	3...512	13 000	7000	6500	
<b>Maximum radial force</b> $P_{r max}$ <sup>(1) (7)</sup>	[N]		340	1700	2400	
<b>Maximum axial force</b> $P_{a max}$ <sup>(1) (7)</sup>	[N]		450	2000	2100	
<b>Service life</b>	[h]	30 000 (lifetime lubrication)				
<b>Backlash</b>	[arcmin]	(1 step)	< 12	< 8	< 8	
		(2 step)	< 15	< 12	< 12	
		(3 step)	< 18	< 14	< 14	

<sup>(1)</sup> 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  $T=30 \text{ °C}$

<sup>(2)</sup> dependent on the respective motor shaft diameter

<sup>(3)</sup> with keyway; for dynamic loads

<sup>(4)</sup> permitted for 30 000 revolutions of the output shaft

<sup>(5)</sup> permitted 1000 times

<sup>(6)</sup> permitted operating temperatures may not be exceeded.

<sup>(7)</sup> referred to the center of the output shaft

Parameter	Unit	Ratio	PE3	PE4	PE5	
<b>Efficiency at nominal torque</b> <sup>(8)</sup>	%	(1 step)	96			
		(2 step)	94			
		(3 step)	90			
<b>Noise level at 3000 min<sup>-1</sup></b> <sup>(9)</sup>	[dB (A)]		58	60	65	
<b>Torsional rigidity</b>	[Nm/arcmin]	(1 step)	2.3	6	12	
		(2 step)	2.5	6.5	13	
		(3 step)	2.5	6.3	12	
<b>Operating temperature</b> <sup>(10)</sup>	[°C]		-25 ... +90			
<b>Lubrication</b>			Lifetime lubrication			
<b>Orientation</b>			any			
<b>Direction of Rotation</b>			same as input			
<b>Product Enclosure Rating</b>			IP54			
<b>Moment of inertia</b> <sup>(11)</sup>	[kgmm <sup>2</sup> ]	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			
<b>Weight</b>	[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	

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

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

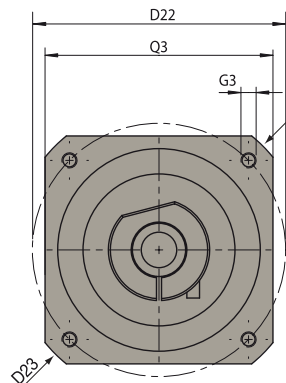
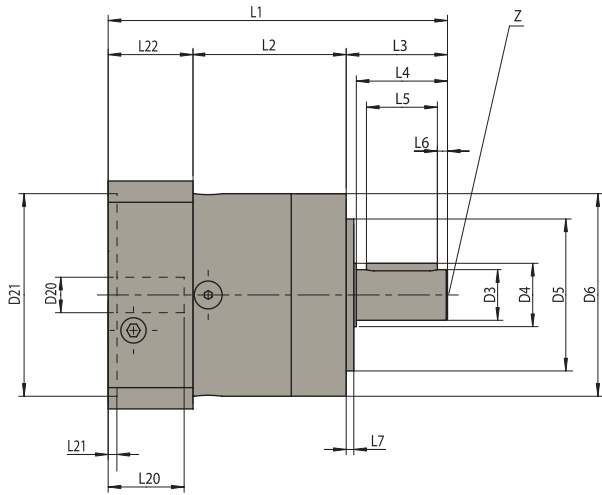
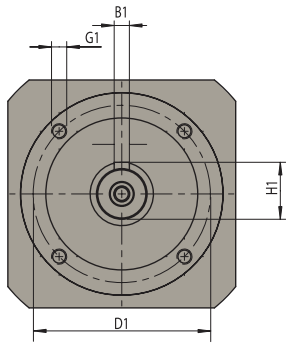
<sup>(10)</sup> referred to the center of the housing surface

<sup>(11)</sup> Inertia refers to the input shaft and to the standard motor shaft diameter D20

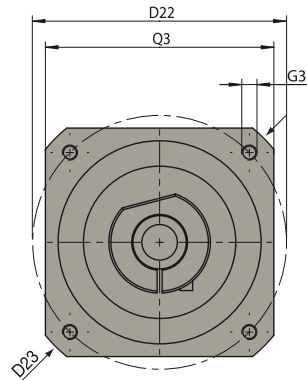
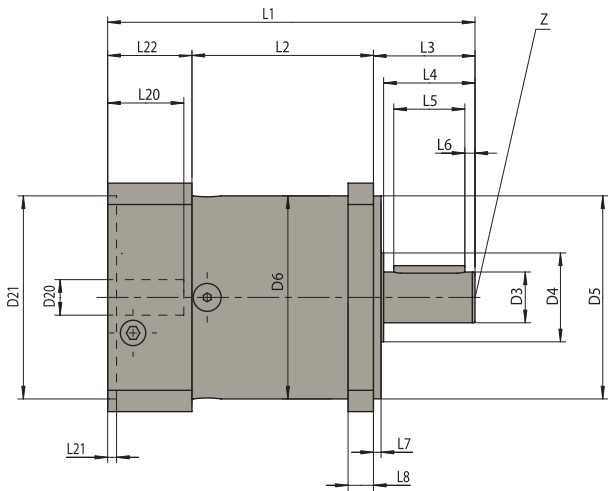
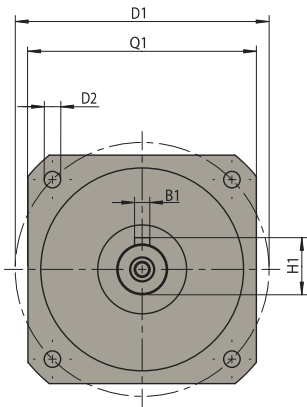


# Dimensions

## PE3



## PE4, PE5



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

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

<b>1 Gearhead Type</b>	<b>PE</b>	Economy planetary gearbox
<b>2 Gearhead Size</b>	<b>3</b>	PE3
	<b>4</b>	PE4
	<b>5</b>	PE5
<b>3 Ratio</b>	<b>003</b>	3
	...	
	<b>512</b>	512
<b>4 Output shaft</b>	<b>10</b>	Input shaft with keyway
<b>5 Motor connection flange</b>	<b>M</b>	
<b>6 Pilot diameter</b>	<b>038</b>	38 mm
	...	
	<b>130</b>	130mm
<b>7 Distance between holes</b>	<b>063</b>	63 mm
	...	
	<b>165</b>	165 mm
<b>8 Shaft diameter</b>	<b>06</b>	6 mm
	...	
	<b>24</b>	24 mm
<b>9 Motor shaft length</b>	<b>20</b>	20 mm
	...	
	<b>50</b>	50 mm

### Motor Gearhead Combination

	Motor 1	Motor 2	Motor 3	Order Code (Gearhead)	Mounting thread G3
<b>PE3</b>	SMH60/B08/09		MH056/B05/09	<b>PE3 XXX 10 M 040/063/09/20</b>	M5
			MH056/B05/11	PE3 XXX 10 M 040/063/11/23	M5
	SMH60/B05/11		MH070/B05/11	<b>PE3 XXX 10 M 060/075/11/23</b>	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
<b>PE4</b>	SMH60/B05/11		MH070/B05/11	<b>PE4 XXX 10 M 060/075/11/23</b>	M5
	SMH82/B08/14			<b>PE4 XXX 10 M 080/100/14/30</b>	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	<b>PE4 XXX 10 M 095/115/19/40</b>	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
<b>PE5</b>	MH105/B09/19			PE5 XXX 10 M 080/100/19/40	M6
	SMH82/B05/19	SMH100/B05/19	MH105/B05/19	<b>PE5 XXX 10 M 095/115/19/40</b>	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

- CO<sub>2</sub> 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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