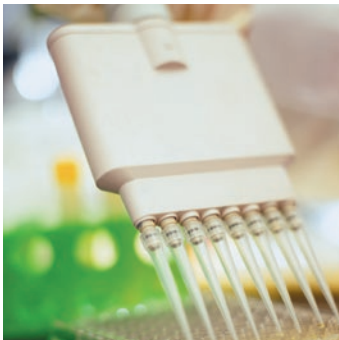


aerospace  
 climate control  
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 filtration  
 fluid & gas handling  
 hydraulics  
 pneumatics  
 process control  
 sealing & shielding



# TWIN-N and SPD-N

Digital Servo Drives



ENGINEERING YOUR SUCCESS.



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# 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.

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#### Electromechanical Worldwide Manufacturing Locations

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Littlehampton, United Kingdom  
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#### 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



Filderstadt, Germany



Dijon, France

# Digital Servo Drives - TWIN-N & SPD-N

## Overview

### Description

TWIN-N is a series of fully-digital, compact and highperformance servo drives for the simultaneous and independent control of two brushless motors. The TWIN-N series is suitable for multiaxis applications where compact size and reduced costs are priority factors.

The TWIN-N is complemented by the SPD-N, which adds a single axis option.

The TWIN-N comprises 3 different models which are able to supply, on a continuative basis, a nominal current from 2 A to 8 A (per axis) and a peak current of 4 A to 16 A (per axis).

The TWIN-N/SPD-N drives are designed for single phase/three phase 230 VAC supply or 380-480 VAC three-phase supply.

TWIN-N/SPD-N drives are designed for market sectors such as packaging, pick&place, tobacco machines, automatic stores, and automatic machinery in general, where rapid acceleration and deceleration are critical application factors.

### Features

- Current, torque and speed control
- Electronic cams, positioner
- Electric shaft
- Virtual master
- PLC integrated (256 steps)
- Configurable feedback
- Internal braking resistor
- DC Bus connection to the terminal board possible



### Technical Characteristics - Overview

<b>Power supply</b>	200...277 VAC monophase (±10 %) 50-60 Hz (±5 %) 200...480 VAC three-phase (±10 %) 50-60 Hz (±5 %)
<b>Control supply</b>	24 VDC (0/+10 %)
<b>Operation temperature</b>	0...45 °C
<b>Operation humidity</b>	<85 % non condensing
<b>Altitude</b>	1000 m asl with 1,5 % derating every 100 m
<b>Protection Rating</b>	IP20
<b>International standard</b>	CE; UL, cUL, CSA (optional) not available for SPD16N

### Two axis Module TWIN-N

Model	Nominal current [A]	Peak current [A]	Peak current time [s]
TWIN2N	2	4	2
TWIN5N	5	10	
TWIN8N	8	16	

### Single axis Module SPD-N

Model	Nominal current [A]	Peak current [A]	Peak current time [s]
SPD2N	2	4	2
SPD5N	5	10	
SPD8N	8	16	
SPD16N	16	32	

## Overview

The parameter based TWIN-N/SPD-N operator interface makes it easy to configure the drive. Standard configurations of different kinds make it suitable for many applications. The TWIN-N can control two brushless motors by a single drive. This feature allows space savings within the electrical panel for multi-axis configurations. TWIN-N comprises two separate drives that can be used totally independently.

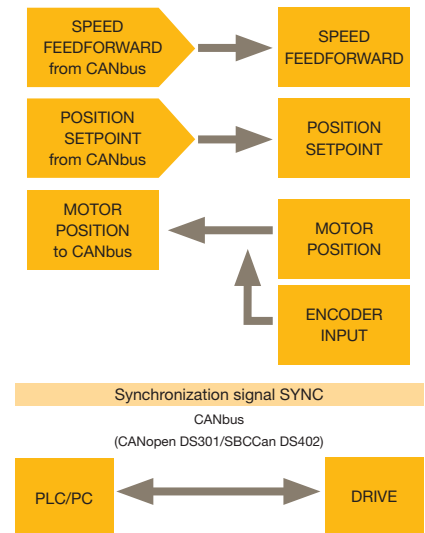
The SPD-N drive is the single drive, single axis version. The drive features a series of integrated auxiliary functions that allow reduced application programming, offering considerable cost saving.

It uses widely used industrial programming standards and guarantees a high degree of flexibility in selecting inputs and outputs. It is also possible to create custom functions within the drive, such as speed or position loop gain control, or active torque control for tool wear monitoring, etc. It can be configured through the serial keypad, serial comms or CANbus.

## Fieldbus

The TWIN-N/SPD-N series have CANbus built in as standard, and can therefore be integrated directly into a CAN network without further additional parts.

The CANbus port on board the drive can be programmed to dialogue with the CANopen DS301/DS402 profile or with propriety profile SBCCan (factory default), which is a propriety motion bus on the CANbus layer specifically optimised for motion control applications. The TWIN-N/SPD-N series can be integrated into networks with Profibus-DP and Devicenet protocol. This connection is via an external Bridge, using the CANbus port programmed with SBCCan protocol. EtherCAT bus, based on the industrial standard Ethernet, has been implemented within the TWIN-N option so to best exploit the industrial PC capabilities.



# Technical Characteristics

## General Characteristics

### TWIN-N, SPD-N

Model		TWIN2N	TWIN5N	TWIN8N	-
		SPD2N	SPD5N	SPD8N	SPD16N
<b>Power supply and current</b>					
Rated output current *	[A <sub>eff</sub> ]	2	5	8	16
Peak output current (2 s)*	[A]	4	10	16	32 (24@8kHz)
Shaft power *	[kW]	1.0	2.6	4.2	7.5
Continuous service installed load*	[kVA]	1.4	3.5	5.6	11.2
Control electronics dissipation*	[W]	25	60	88	180
Internal fan capacity	[m <sup>3</sup> /h]				135
Switching frequency	[kHz]	8			4
Output frequency	[Hz]	0...450			
<b>Dynamic braking and intermediate DC circuit</b>					
Internal DC capacitors	[μF]	470 ±20 %			680 ±20 %
Braking resistor internal/external	[Ω]	40			
Peak internal braking power	[kW]	16,2			
Continuous internal braking power	[W]	120			
Max duty cycle (internal resistance)	[%]	0.75			

<sup>1)</sup> the value for TWIN-N is for each of the two axis.

## TWIN-N and SPD-N Features

<b>Feedback</b>	
	<ul style="list-style-type: none"> <li>• Resolver (TWIN-N, SPD-N)</li> <li>• Encoder (TWIN-NE, SPD-NE)</li> </ul>
<b>Auxiliary encoder input</b>	
	in quadrature encoder (coupled)
<b>Max frequency</b>	
	400 kHz
<b>RS422 encoder simulation output</b>	
	4...65 000 steps/rev
<b>Max frequency</b>	
	160 kHz
<b>Serial link</b>	
	RS422 / RS485
<b>Fieldbus</b>	
	CAN ISO/DIS11898
<b>Inputs / outputs (each single axis)</b>	
	<ul style="list-style-type: none"> <li>• 4 digital inputs 0...24 V</li> <li>• 2 digital outputs</li> <li>• 1 differential analog reference ±10 V</li> <li>• 1 differential auxiliary analog input ±10 V</li> <li>• 1 analog output single ended ±10 V</li> </ul>
<b>Safety technology</b>	
	Built-in Safety relay cat. 3 in accordance with EN ISO 13849-1:2006 and EN ISO 13849-2:2008 - not certified according the latest standard

## Electrical Characteristics

### Power supply

Model		TWIN-N/SPD-N
	Unit	<b>Control stage</b>
Supply voltage	[VDC]	24 V (0...+10 %)
Current rating of the external power supply	[A]	2
Control electronics dissipation	[W]	25
EMC filter	-	internal
		<b>Power stage</b>
Mains frequency	[Hz]	50...60 ±5 %
Supply voltage	[VAC]	3-phase: 200...480 ±10 % 1-phase: 200...277 ±10 %
DC voltage range	[VDC]	282...678 ±10 %

## Environmental Characteristics

### Ambient conditions

<b>Temperature range</b>	<ul style="list-style-type: none"> <li>Operating temperature: 0...+45 °C (+32...+113 °F)</li> <li>Storage temperature: 1K4 class, -20 ...+55 °C (-4...+131 °F)</li> <li>Transportation temperature: 2K3 class, -25 ... +70 °C (-13...+158 °F)</li> </ul>
<b>Humidity</b>	Humidity: 3K3 class <ul style="list-style-type: none"> <li>Relative: &lt;85 % without ice and condensation</li> <li>Absolute: &lt;25 g/m<sup>3</sup></li> </ul>
<b>Altitude (*)</b>	≤1000 m asl (≤3281 feet asl)
<b>Protection Rating</b>	IP20 (only in close electric cabinet), UL open type equipment
<b>Pollution degree</b>	2 or lower (no conductive dust allowed)

\* For higher installation altitude, derate the output current by 1.5 % each 100 m up to 2000 m maximum

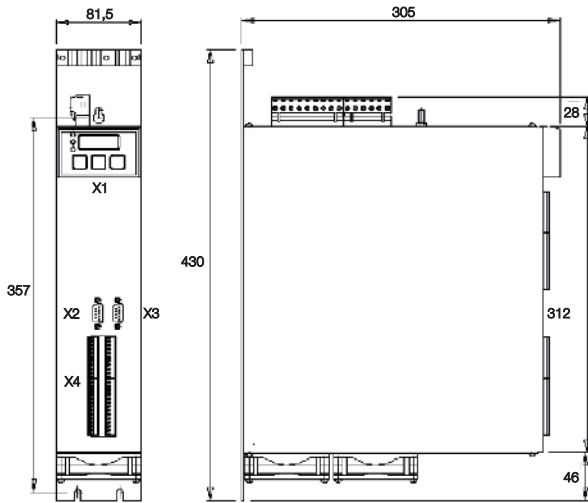
## Standards and Conformance

<b>Safety standards</b>	<ul style="list-style-type: none"> <li>2006/95/EC: Low voltage directive</li> <li>EN 61800-5-1: Adjustable speed electrical power drive systems - Part 5-1: Safety requirements, electrical, thermal and energy</li> </ul>
<b>Certification</b>	<ul style="list-style-type: none"> <li>UL: UL508C (USA) Power Conversion Equipment</li> <li>CSA: CSA22.2 Nr. 14-05 (Canada) Power Conversion Equipment</li> </ul>
<b>Electromagnetic compatibility</b>	<ul style="list-style-type: none"> <li>2004/108/EC: EMC directive</li> <li>EN 61800-3: Adjustable speed electrical power drive systems - Part 3: EMC requirement and specific test methods</li> </ul>

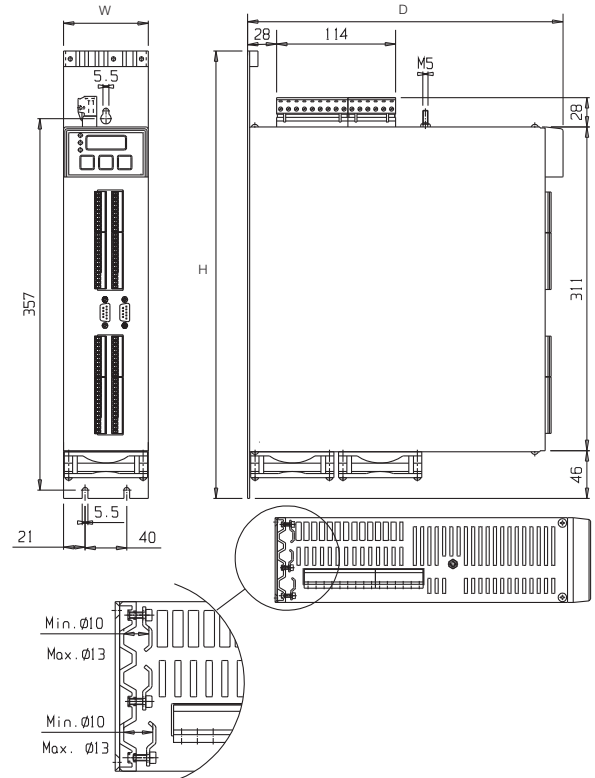


## Dimensions

**SPD-N 2-5-8-16**



**TWIN-N 2-5-8**



Model	H [mm]	W [mm]	D [mm]	Weight [kg]
TWIN-N	430	81.5	303	6.5
SPD-N				

## Connector Layout



### Power connection terminal box

- Line
- Motor 1
- Motor 2
- DC Bus

### Connection terminal box Axis 1

- 2 opto isolated digital inputs 24 VDC (shared with axis 1 and axis 2)
- 2 opto isolated digital outputs (axis 1)
- 1 differential analog reference  $\pm 10$  V (axis 1)
- 1 differential auxiliary analog input  $\pm 10$  V (axis 1)
- 1 analog output  $\pm 10$  V single ended (axis 1)
- 1 Resolver or encoder SinCos or digital input + Hall probe
- 1 configurable encoder input
- 1 configurable encoder output

### Connection terminal box Axis 2 (only TWIN-N)

- 4 opto isolated digital inputs 24 VDC (axis 2)
- 2 opto isolated digital outputs (axis 2)
- 1 differential analog reference  $\pm 10$  V (axis 2)
- 1 differential auxiliary analog input  $\pm 10$  V (axis 2)
- 1 analog output  $\pm 10$  V single ended (axis 2)
- 1 Resolver input
- 1 configurable encoder input
- 1 configurable encoder output
- Configurable CAN interface
- RS422/485 interface

## Accessories and Options

### Keypad

SK158/S

Display Module for SPD-N series

SK158/T

Display Module for TWIN-N series



### I/O Expansion Module

SK135/S

- 16 in + 8 out
- SBCCAN interface



### Cables

- Power and signal cables for resolver, incremental and absolute encoder and SinCos feedback
- Cable to connect a Bridge with several TWIN-N/SPD-N



### Network Bridge

Interface protocol:

- DeviceNet
- Profibus DP



### Fieldbus

- SBCCan (standard)
- CANopen (DS301, DS402)
- EtherCAT

## Software

### MotionWiz

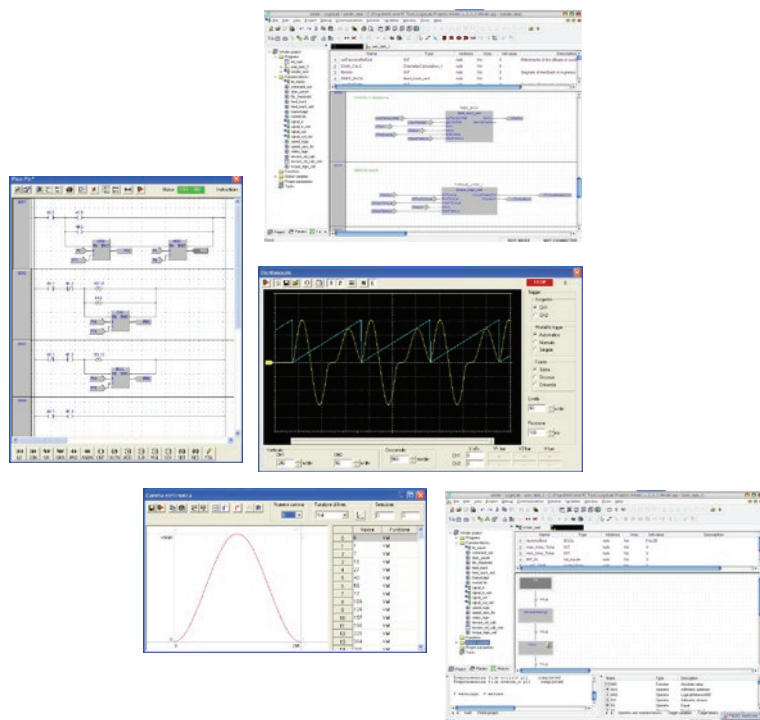
The free MotionWiz configuration software is available to configure the TWIN system with just a few clicks of the mouse. MotionWiz features an easy and "friendly" interface to speed up installation, optimisation and diagnostics procedures. To simplify configuration, MotionWiz shows a typical Windows® environment on the monitor with dialogue windows and toolbars.

MotionWiz permits performing operations in both "on line" mode, directly in the mechanism, and in "off line" mode in remote on the PC. In this case, personalised configuration can be sent to the mechanism subsequently.

To simplify the configuration of systems with a large number of axes but with different cuts and the same operating mode, MotionWiz permits maintaining the same mechanism configuration and only changing the type of selected motor. Inside the MotionWiz configurator is a database containing the data of standard Parker motors.

MotionWiz incorporates "picoPLC", a built-in PLC environment programmable with standard language. PicoPLC allows the external word to communicate with the drive and to execute function sequences.

This environment consists of an editor with instruction list and ladder functions that also permits online debug. comments can also be entered to the code in the editor and the programme made as application documentation can be printed in report form.



## Order Code

### Digital Servo Drives - TWIN-N and SPD-N

	1	2	3	4	5	6	7	8	9	10	11
Order example	<b>TWIN</b>	<b>2</b>	<b>N</b>	<b>S</b>	<b>E</b>	<b>E5</b>	<b>R</b>	<b>T</b>	<b>B</b>	<b>UL</b>	<b>Z</b>

<b>1 Servo family</b>	<b>SPD</b>	Digital servo drives
	<b>TWIN</b>	Double axis digital servo drives
<b>2 Drive size (nominal current)</b>	<b>2</b>	2 A
	<b>5</b>	5 A
	<b>8</b>	8 A
	<b>16</b>	16 A (only SPD-N)
<b>3 Series</b>	<b>N</b>	New Series
<b>4 Protocol</b>	<b>S</b>	Protocol SBCCan (standard)
	<b>C</b>	Protocol CANopen (DS301)
	<b>D</b>	Protocol CANopen (DS402)
<b>5 Encoder input</b>	<b>empty field</b>	Resolver
	<b>E</b>	EnDat/incremental/SinCos Encoder Input (from motor feedback)
	<b>H</b>	Incremental Encoder input with Hall probe (from motor feedback)
	<b>F</b>	SinCos Encoder Input one sin polar step or turn
<b>6 Optional board</b>	<b>E5</b>	EtherCAT
<b>7 Safety relay</b>	<b>R</b>	Built-in Safety relay cat. 3 in accordance with EN ISO 13849-1:2006 and EN ISO 13849-2:2008 - not certified according the latest standard
<b>8 Toroid and Options</b>	<b>T</b>	Inductance core on cables motor inside the drive
	<b>S</b>	Panel short cable installation
	<b>L</b>	Panel long cable installation
<b>9 Bracket to fix the cable</b>	<b>B</b>	Without brackets to fix the cables
<b>10 UL Certification</b>	<b>UL</b>	(not available for SPD16N)
<b>11 Firmware revision</b>	<b>Z</b>	Number of firmware revision (optional only for special version up to 3 figures)

## Accessories

### Communication interface

	1	2
Order example	<b>BRIDGEN</b>	<b>PS</b>

<b>1 Bridge (communication interface)</b>	<b>BRIDGEN</b>	Bridge N (communication interface)
<b>2 Interface</b>	<b>PS</b>	with PROFIBUS DP
	<b>DS</b>	with DeviceNet
	<b>D1S</b>	with DeviceNet "compact"
	<b>U</b>	with Encoder Input - SBCCAN







# 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

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<sub>2</sub> 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  
Electrohydraulic 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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### EMEA Product Information Centre

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