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SLVD-N

Compact Servo Drive



ENGINEERING YOUR SUCCESS.



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- the global leader in motion and control technologies

A world class player on a local stage

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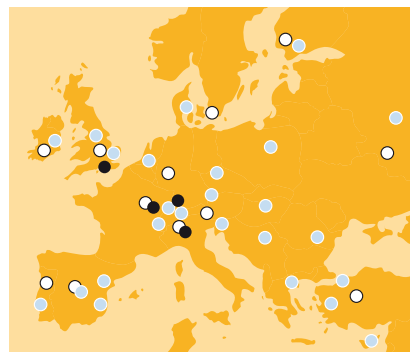
For contact information, please refer to the Sales Offices on the back cover of this document or visit www.parker.com



Milan, Italy



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- Manufacturing
- Parker Sales Offices
- Distributors



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Compact Servo Drive - SLVD-N

Overview

Description

SLVD-N is the family of compact digital servo drives for brushless motors which, in addition to positioning applications with trapezoidal profile, electrical shaft, electronic cam, spindle orientation, simulator of stepper motor and torque control, holds a PLC inside able to talk to the most common industrial programming systems, giving a great freedom of use of the inputs and outputs. It also allows the development of additional configurations to the basic features of the drive, such as gains adjustment of the loop in relation to speed or space, torque monitoring used for tools etc.

The SLVD-N range is equipped with a serial interface RS422/RS485 allowing the operator to configure, monitoring, give commands to up to 32 units simultaneously. A CANbus interface is available both in communication mode and in real time mode with SBCCAN, DS301, DS402 protocols.

Typical applications:

- Packaging machines
- Pick & place systems
- General purpose machines

Features

- Torque/current/speed control
- Advanced manager of torque limits
- Management of speed windows
- Positioner
- Electric shaft
- Electronic cam
- Controls the motor torque with the addition of speed control
- Virtual master
- Internal PLC - programming according to IEC61131 (option)
- Configurable feedback
- Standard interface: RS422/485, CANopen
- Optional interface: EtherCAT
- Internal braking resistor
- Internal EMC filter for three phase power supply
- Safety: STO function optional



Technical Characteristics - Overview

Power supply	200...230 VAC single/three phase (±10 %) 50-60 Hz (±5 %) - only TT/TN networks
Control supply	24 VDC (-0/+10 %)
Overload	200 % for 2 s
Operating temperature	0...45 °C
Operating humidity	<85 % non condensing
Altitude	1000 m asl with 1.5 % derating every 100 m, up to 2000 m
Protections	IP20
International standards	CE, UL, cUL

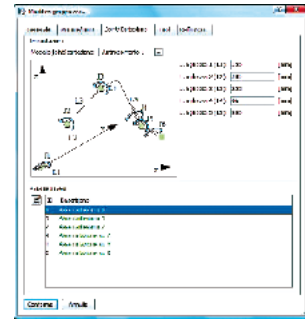
Model	Continuous current [A]	Peak current [A]	Size
SLVD1N	1.25	2.5	1
SLVD2N	2.5	5	
SLVD5N	5	10	
SLVD7N	7	14	
SLVD10N	10	20	2
SLVD15N	15	30	
SLVD17N	17	34	

Typical Applications

Industry: Robotics

Application: Painting robot

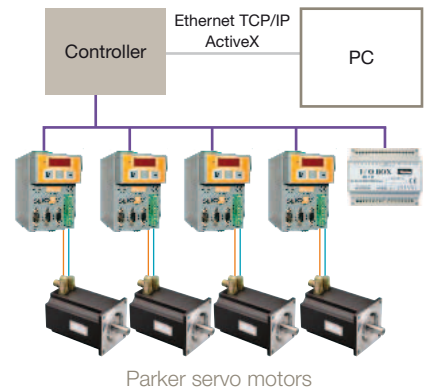
6/7 axes painting robot controlled by the SLVD-N servo drive. Full control of the machine is done with a dedicated motion controller and the remote I/O is managed over CANopen.



Industry: Glass Industry

Application: Machining Centre

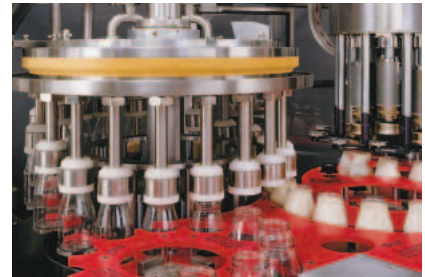
A 4 axis machine (x, y, z, mandrel) executing the following operations: drilling, threading and linear milling on materials of different types. The system comprises of 4 SLVD-N and 4 SMB motors. The control of the machine is via a dedicated motion controller. The remote I/O is controlled with CANopen protocol.



Industry: Beverage Industry

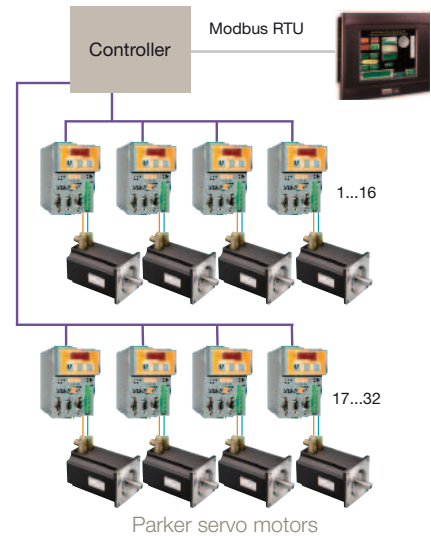
Application: Multi-head bottle capper

A multi-head machine able to cap bottles of different format. Each head, in order to reduce setup time, installs 2 SLVD-Ns, one dedicated to the vertical movement of the head depending on the carousel position and the other dedicated to the capping with preset torque. The machine is made of up to 16 heads with 2 SLVD-Ns each. The control of the machine based to a motion controller. The remoted I/O is controlled with CANopen protocol.



Multi-head bottle capper

A multi-head machine to cap bottles of different formats. Each head has 1 SLVD-N dedicated to cap fastening with torque control. The machine is made of up to 32 heads with 1 SLVD-N per head. The control of the machine based on a motion controller. The remote I/O is controlled with CANopen protocol.



Technical Characteristics

Technical Data

Model		SLVD1N	SLVD2N	SLVD5N	SLVD7N	SLVD10N	SLVD15N	SLVD17N	
	Unit								
Input and output characteristic									
Rated input current (FLA)	[A _{eff}]	1.5	2.99	5.99	8.38	11.97	17.96	20.36	
Rated output current	[A _{eff}]	1.25	2.5	5	7	10	15	17	
Peak output current (2 s)	[A]	2.5	5	10	14	20	30	34 (30@8 kHz)	
Shaft power	[kW]	0.345	0.7	1.5	2.2	3.0	4.5	5	
Continuous service installed load (power derating)	1ph [kVA]	0.85	1.5	1.5	1.8	3.0	3.3	3.3	
	3ph	0.95	1.6	2.3	3	5.25	6.5	6.5	
Continuous service input current (power derating)	1ph [A _{eff}]	3.8	6.5	6.5	7.8	14.3	14.3	14.3	
	3ph	2.4	4.2	5.9	7.6	13.3	17.2	17.2	
Power stage dissipation	[W]	9.3	19.2	52.0	75.1	100.3	158.3	180	
Switching frequency	[kHz]	4...8						4...8	
Output frequency	[Hz]	0...450							
Dynamic braking and intermediate DC circuit									
Internal DC capacitors (±20 %)	[μF]	680			820	1800			
Braking resistor internal	[Ω]	40					16		
Peak internal braking power to 415 VDC	[kW]	4.3					10.7		
Max continuous external braking power	[kW]	1					2		
Max duty cycle (internal resistance)	[%]	1.20					1.10		

SLVD-N Features

Feedback	<ul style="list-style-type: none"> • Resolver (SLVD-N) • Encoder (SLVD-NE) • Encoder+Hall (SLVD-NH)
Auxiliary encoder input	in quadrature
Max frequency encoder input	400 kHz
RS422 encoder simulation output	4...65 000 steps/rev
Max frequency	160 kHz
Serial link	RS422 / RS485
Fieldbus	CAN ISO/DIS11898
Inputs / outputs	<ul style="list-style-type: none"> • 4 digital inputs 0...24 V • 2 digital outputs • 1 differential analog reference ±10 V • 1 differential auxiliary analog input ±10 V • 1 analogue output single ended ±4 V
Safety technology	STO function optional - category 3 performance level in compliance with UNI EN ISO 13849-1- SIL capability 3 in compliance with CEI EN 61800-5-2, PL=e

Electrical Characteristics

Power supply

Model		SLVD-N
	Unit	Control stage
Supply voltage	[VDC]	24 V (-0...+10 %)
Max. ripple	[V _{pkpk}]	Do not go over the range
Current rating of the external power supply	[A]	1
Control electronics dissipation	[W]	15
EMC filter	-	internal
		Power stage
Mains frequency	[Hz]	50...60 ±5 %
Supply voltage (3-phase or 1-phase)	[VAC]	200...230 ±10 % (only for TT, TN mains)
DC voltage range	[VDC]	282...325 ±10 %
EMC filter	-	internal

Environmental Characteristics

Ambient conditions

Temperature range	<ul style="list-style-type: none"> Operating temperature: 3K3 class, 0...+45 °C (+32...+113 °F) Storage temperature: 1K4 class, -25 ...+55 °C (-4...+131 °F) Transportation temperature: 2K3 class, -25 ... +70 °C (-13...+158 °F)
Humidity	<ul style="list-style-type: none"> Operating humidity: 3K3 class, 5...85 % without ice and condensation Storage humidity: 1K3 class, 5...95 % without ice and condensation Transportation humidity: 2K3 class, 95 % a 40 °C
Altitude (*)	≤1000 m asl (≤3281 feet asl)
Protection degree	IP20 (only in close electric cabinet), UL open type equipment
Pollution degree	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

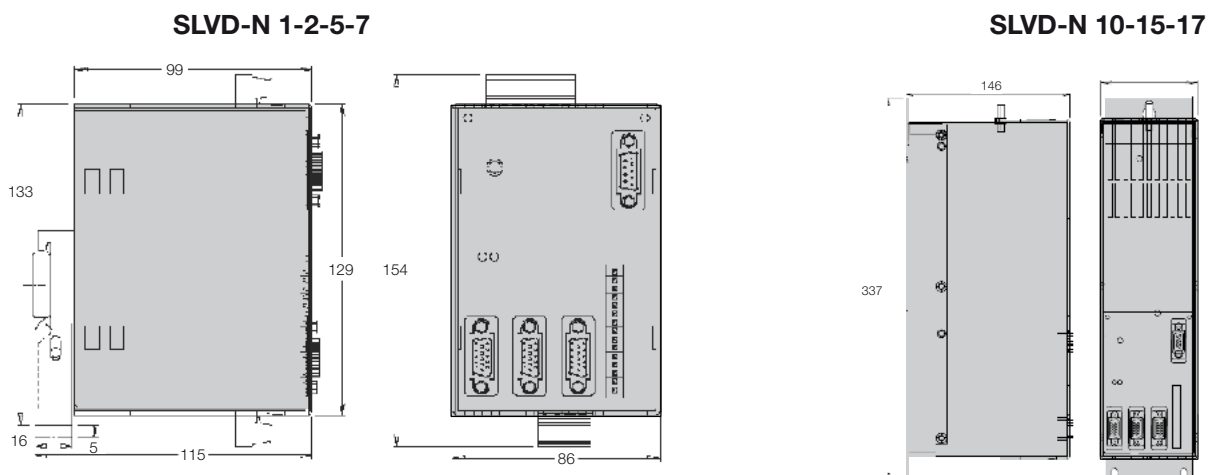
Shock and vibration

IEC60068-2-6	Frequency [Hz]	Width [mm]	Acceleration [m/s ²]
	10 ≤ f ≤ 57	0.075	-
	57 < f ≤ 150	-	9.81

Standards and Conformance

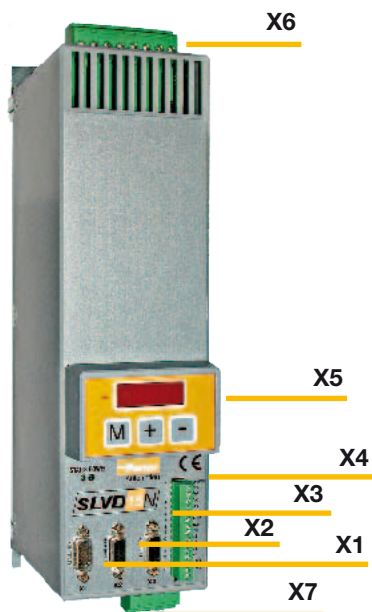
Safety standards	<ul style="list-style-type: none"> 2006/95/EC: Low voltage directive EN 61800-5-1: Adjustable speed electrical power drive systems - part 5-1: safety requirements, electrical, thermal and energy
Certification	<ul style="list-style-type: none"> UL: UL508C (USA) Power Conversion Equipment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

Dimensions



Model	Height [mm]	Width [mm]	Depth [mm]	Weight [kg]
SLVD-N 1-2-5-7	154	86	115	1.1
SLVD-N 10-15-17	337	87	146	3.1

Connector Layout



X1	RS422/485 - CAN interface
X2	Encoder input/output
X3	Resolver/encoder configurable input
X4	4 digital inputs 0-24 V 2 digital outputs 1 differential analogue reference ± 10 V 1 differential aux analog input ± 10 V 1 analogue output single ended ± 4 V
X5	Optional board connector (behind the keypad)
X6	Power terminal block
X7	DC bus terminal block

Accessories and Options

Keypad

SK158/L ¹⁾

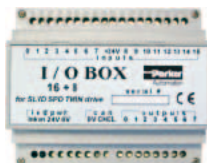
Easy to use to program the functional data, control the status of the converter and send commands.



I/O Expansion Module

SK135/S

- 16 in + 8 out
- SBCCAN interface



Cables

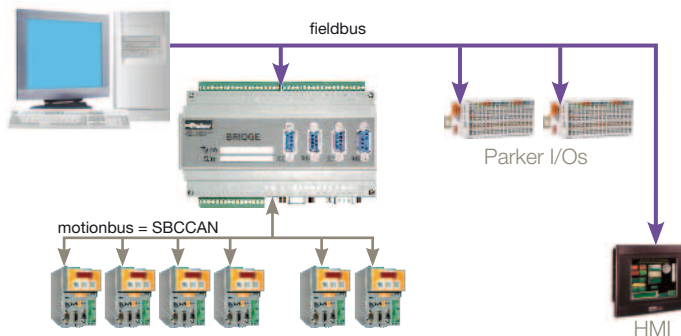
- Power and signal cables for resolver, incremental and absolute encoder and SinCos feedback
- Cable to connect a Bridge with several SLVD-N drives



Network Bridge

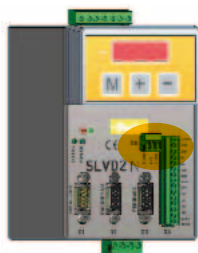
Interface protocol:

- DeviceNet
- Profibus DP



Safety Option

Option "Safe Torque off" (STO) for all SLVD-N drives available



EtherCAT Fieldbus

Applying industrial standard fieldbus systems enables the SLVD-N to be very versatile.

Option EtherCAT (E5, E6):

Feature: 1 EtherCAT option for up to 3 SLVD-N (requirement SLVD-N with EtherCAT protocol)



SLVD-N & EtherCAT box (option E5)

¹⁾ Not in combination with option E5

Software

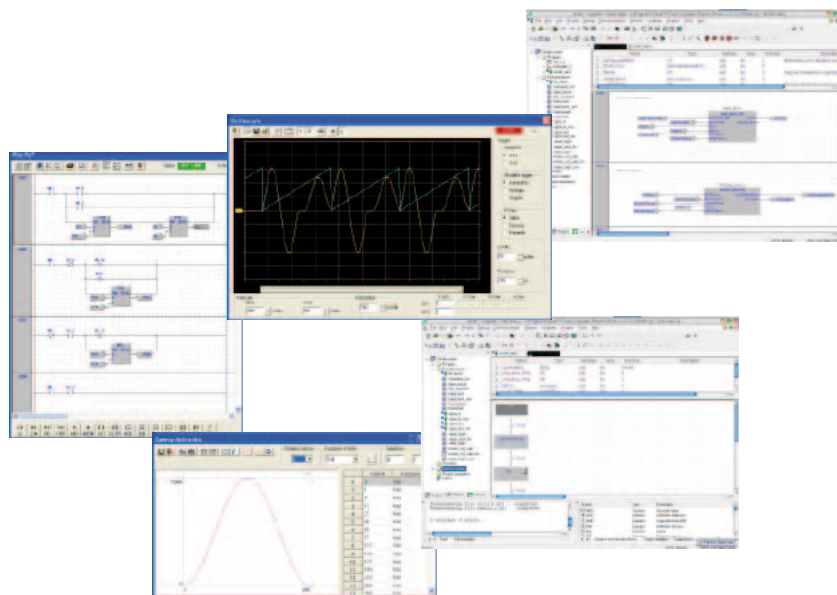
MotionWiz and LogicLab

The free MotionWiz configuration software is available to configure the SLVD-N 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 axis 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. Should the custom application require additional computational resources, an option software environment can be used, programmable with PLC commands according to IEC61131-3.



Order Code

Compact Servo Drive - SLVD-N

	1	2	3	4	5	6	7	8
Order example	SLVD	1	N	S	E			UL

1 Servo family	SLVD	Compact Digital Servodrive
2 Drive size (nominal current)	1	1 A
	2	2 A
	5	5 A
	7	7 A
	10	10 A
	15	15 A
	17	17 A
3 Version	N	New version
4 Protocol	S	SBCCAN protocol (standard)
	C	CANopen protocol (DS301)
	D	CANopen protocol (DS402)
	E5	EtherCAT protocol (only with optional board E5 or E6 in the bus system)

5 Encoder input	Empty field	Resolver
	E	EnDat/incremental/SinCos encoder input (from motor feedback)
	H	Incremental encoder input with Hall sensor (from motor feedback)
	F	SinCos encoder input
6 Optional boards	Empty field	without optional board
	E5	OP-ETCAT - EtherCAT option (for up to 3 SLVD-N, keypad SK158/L not possible)
	E6	E5 + keypad SK158/L (for up to 3 SLVD-N)
7 Safety	Empty field	without STO
	R	STO (Safe Torque Off function)
8 Firmware review	Empty field	without UL certification
	UL	UL certification (not for all drive sizes available, please contact your Parker partner)

Accessories

Communication interface

	1	2
Order example	BRIDGEN	PS

1 Bridge (communication interface)	BRIDGEN	Bridge N (communication interface)
2 Interface	PS	with PROFIBUS DP
	DS	with DeviceNet
	D1S	with DeviceNet "compact"
	DU	with Encoder Input - SBCCAN

Cables (Bridge - SLVD-N)

	1	2	3	4
Order example	CAVO	BRIDGEX	1	- 2SLVDN

1 Type	CAVO	Cable
2 Product application	BRIDGEX	Connection Bridge - SLVD-N
3 Cable length (length from Bridge to SLVD-N)	1	1 m
	1.5	1.5 m
	2	2 m
4 Number of connections/drives (min. 2, max. 8)	2SLVDN	for 2 SLVD-N
	3SLVDN	for 3 SLVD-N
	4SLVDN	for 4 SLVD-N
	4SLVDN-R	for 4 SLVD-N-R (only 1.5 m)
	8SLVDN	for 8 SLVD-N

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 fluidics
- 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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