

# SLVD-N

Compact Servo Drive



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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 basis 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, CANopen, 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 / PROFINET
- Internal braking resistor
- Internal EMC filter for three phase power supply
- Safety: STO function optional (certification expired, recertification pending)



### Technical Characteristics - Overview

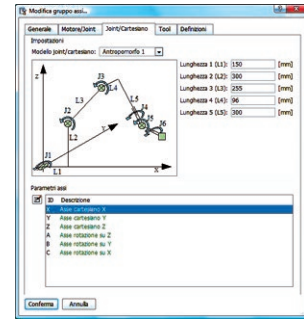
<b>Power supply</b>	200...230 VAC single/three phase (±10 %) 50-60 Hz (±5 %) - only TT/TN networks
<b>Control supply</b>	24 VDC (-0/+10 %)
<b>Overload</b>	200 % for 2 s
<b>Operating temperature</b>	0...45 °C
<b>Operating humidity</b>	<85 % non condensing
<b>Altitude</b>	1000 m asl with 1.5 % derating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

**Industry: Robotics**

**Application: Painting robot**

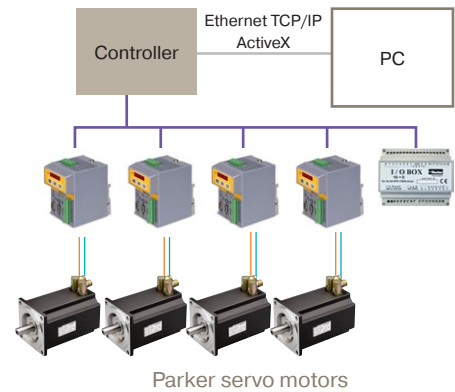
6/7 axes painting robot controlled by the SLVD-N servo drive. Full control of the machine is done with a dedicated motion controller and the remote I/O is managed over CANopen.



**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**

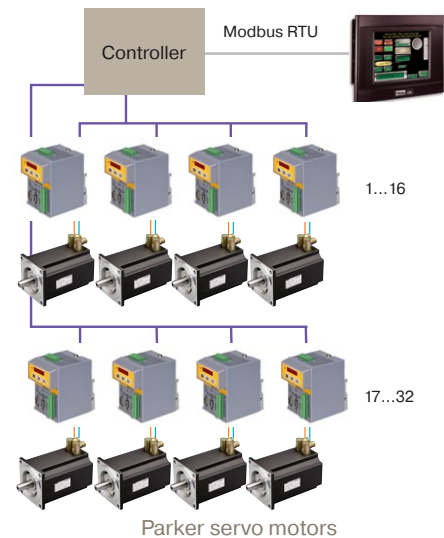
**Application: Multi-head bottle capper**

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								
<b>Input and output characteristic</b>									
Rated input current (FLA)	[A <sub>eff</sub> ]	1.5	2.99	5.99	8.38	11.97	17.96	20.36	
Rated output current	[A <sub>eff</sub> ]	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 <sub>eff</sub> ]	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							
<b>Dynamic braking and intermediate DC circuit</b>									
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

<b>Feedback</b>	<ul style="list-style-type: none"> <li>• Resolver (SLVD-N)</li> <li>• Encoder (SLVD-NE)</li> <li>• Encoder+Hall (SLVD-NH)</li> </ul>
<b>Auxiliary encoder input</b>	in quadrature
<b>Max frequency encoder input</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</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 analogue output single ended ±4 V</li> </ul>
<b>Safety technology</b>	STO function optional - (certification expired, recertification pending)

## Electrical Characteristics

### Power supply

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

## Environmental Characteristics

### Ambient conditions

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

### Shock and vibration

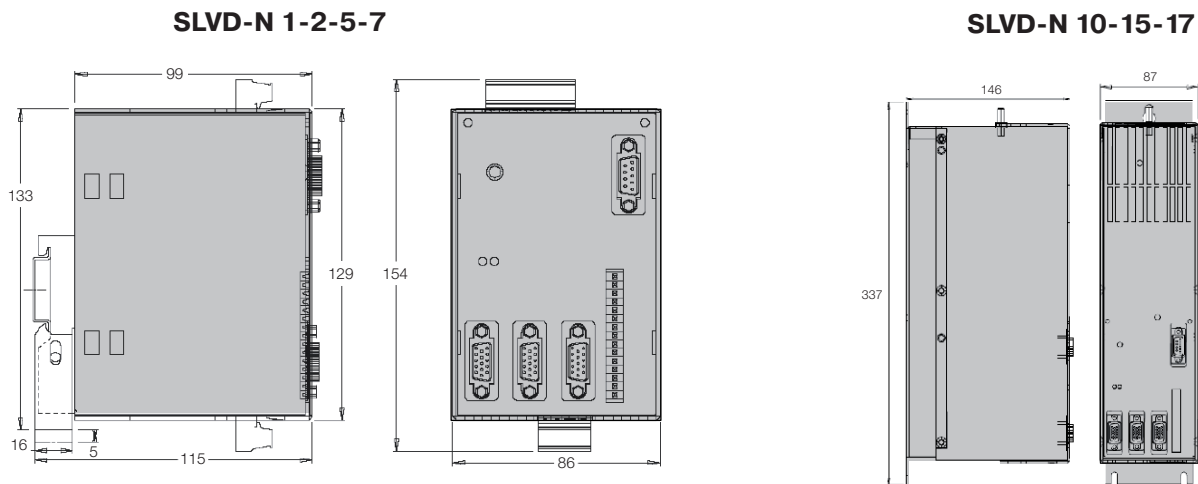
IEC60068-2-6	Frequency [Hz]	Width [mm]	Acceleration [m/s <sup>2</sup> ]
	10 ≤ f ≤ 57	0.075	-
	57 < f ≤ 150	-	9.81

## 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. 14-5 (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>

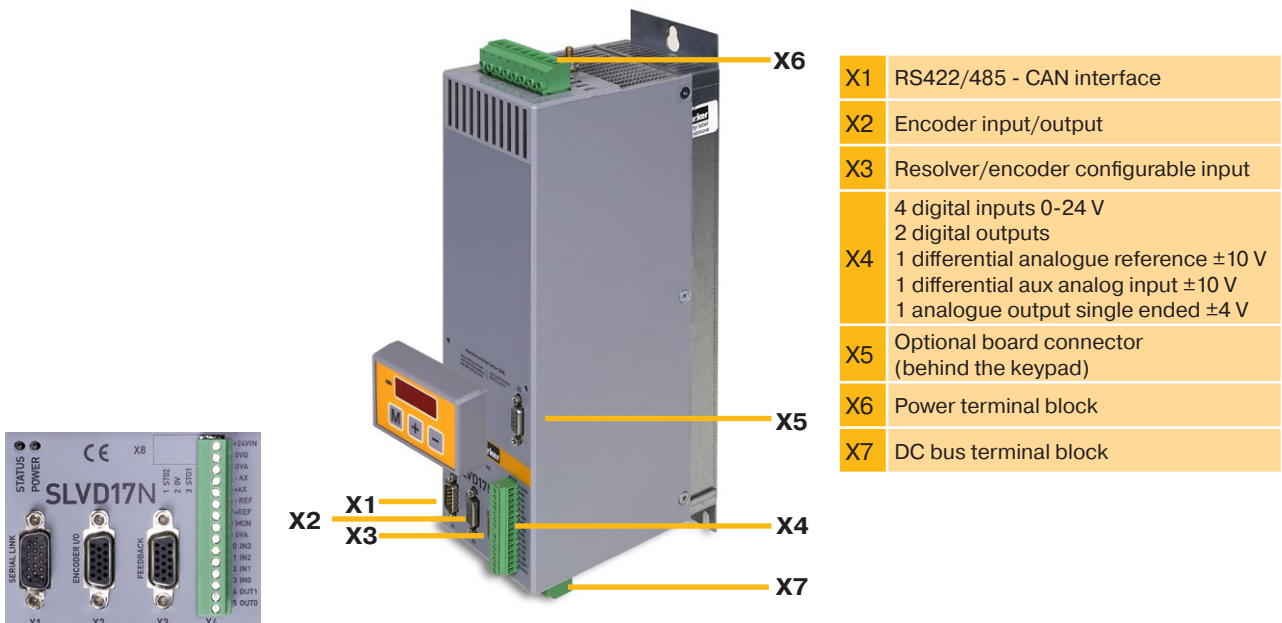


## Dimensions



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  $\pm 10$  V  
1 differential aux analog input  $\pm 10$  V  
1 analogue output single ended  $\pm 4$  V
- X5 Optional board connector (behind the keypad)
- X6 Power terminal block
- X7 DC bus terminal block

## Accessories and Options

### Keypad

SK158/L <sup>1)</sup>

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



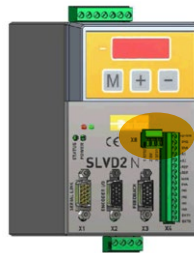
### Cables

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



### Safety Option

Option "Safe Torque off" (STO) for all SLVD-N drives available (certification expired, recertification pending)



### 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)

#### Option PROFINET (P1, P2)



Fieldbus box (option E5,E8)

<sup>1)</sup> Not in combination with option E5,E8

## Software

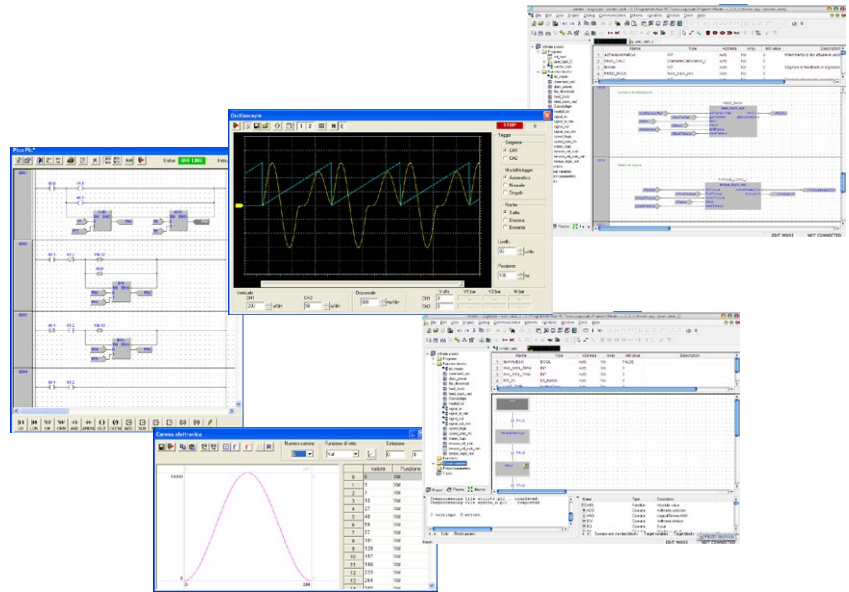
### MotionWiz and LogicLab

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	<b>SLVD</b>	<b>1</b>	<b>N</b>	<b>S</b>	<b>E</b>			<b>UL</b>

### 1 Servo family

**SLVD** Compact Digital Servodrive

### 2 Drive size (nominal current)

<b>1</b>	1 A
<b>2</b>	2 A
<b>5</b>	5 A
<b>7</b>	7 A
<b>10</b>	10 A
<b>15</b>	15 A
<b>17</b>	17 A

### 3 Version

**N** New version

### 4 Protocol

<b>S</b>	SBCCAN protocol (standard)
<b>C</b>	CANopen protocol (DS301)
<b>D</b>	CANopen protocol (DS402)
<b>E5</b>	EtherCAT protocol (only with optional board E5 or E6 in the bus system)
<b>P1</b>	PROFINET (only with optional board P1 or P2)

### 5 Encoder input

<b>Empty field</b>	Resolver
<b>E</b>	EnDat/incremental/SinCos encoder input (from motor feedback)
<b>H</b>	Incremental encoder input with Hall sensor (from motor feedback)
<b>F</b>	SinCos encoder input

### 6 Optional boards

<b>Empty field</b>	without optional board
<b>E5</b>	OP-ETCAT - EtherCAT option (for up to 3 SLVD-N, keypad SK158/L not possible)
<b>E6</b>	E5 + DB9 for keypad SK158/L (for up to 3 SLVD-N)
<b>P1</b>	PROFINET
<b>P2</b>	P1 + DB9 for keypad SK158/L

### 7 Safety

<b>Empty field</b>	without STO
<b>R</b>	STO - Safe Torque Off (certification expired, recertification pending)

### 8 Firmware review

<b>Empty field</b>	without UL certification
<b>UL</b>	UL certification (not for all drive sizes available, please contact your Parker partner)







# 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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