

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



## SLVD-N

Compact Servo Drive



北京润诚时代科技有限公司

地址：北京市朝阳区汤立路218号A座 301 室

电话：010-84450370

网址：www.runcheng.net

邮箱：runcheng\_emd@sina.com



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# Parker Hannifin

## The global leader in motion and control technologies

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#### 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

##### Europe

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

##### Asia

Wuxi, China  
Jangan, Korea  
Chennai, India

##### North America

Rohnert Park, California  
Irwin, Pennsylvania  
Charlotte, North Carolina  
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Offenburg, Germany

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Milan, Italy



Littlehampton, UK



Filderstadt, Germany



Dijon, France

# 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



### 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	

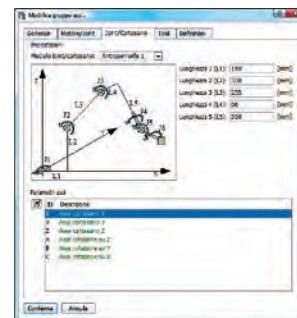


## Typical Applications

### Industry: Robotics

#### Application: Painting robot

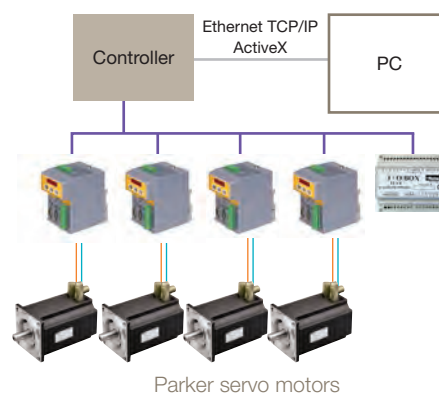
6/7 axes painting robot controlled by the SLVD-N servo drive. Full control of the machine is done with a dedicated motion controller and the remote I/O is managed over CANopen.



### 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

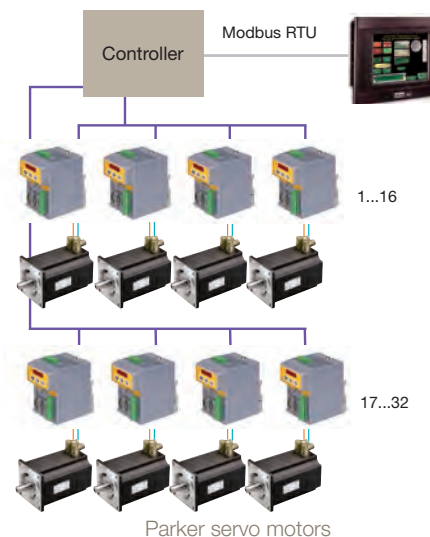
#### Application: Multi-head bottle capper

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)	[Aeff]	1.5	2.99	5.99	8.38	11.97	17.96	20.36
Rated output current	[Aeff]	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
	3ph		0.95	1.6	2.3	3	5.25	6.5
Continuous service input current (power derating)	1ph	[Aeff]	3.8	6.5	6.5	7.8	14.3	14.3
	3ph		2.4	4.2	5.9	7.6	13.3	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

<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 - 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 <sub>pkpk</sub> ]	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"> <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>
Humidity	
	<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>
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

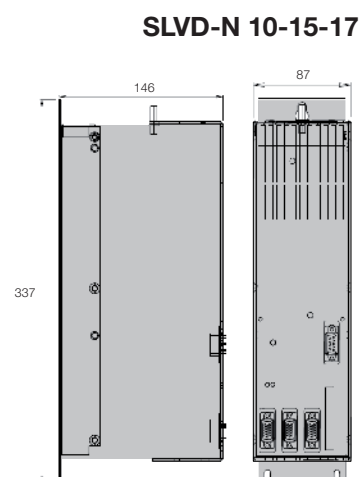
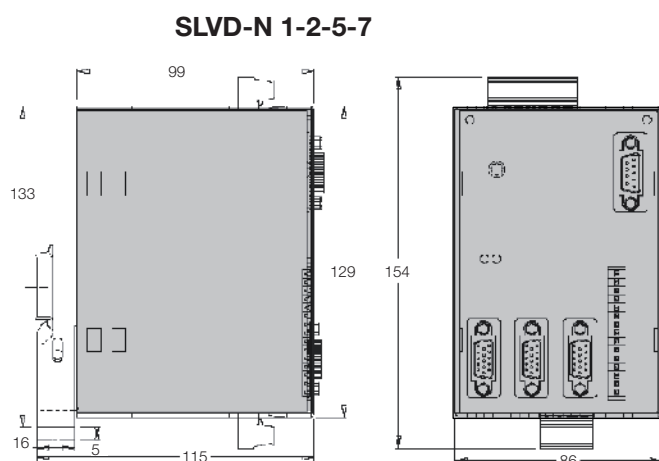
IEC60068-2-6	Frequency [Hz]	Width [mm]	Acceleration [m/s <sup>2</sup> ]
	10 ≤ f ≤ 57	0.075	-
	57 < f ≤ 150	-	9.81

## Standards and Conformance

Safety standards	
	<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>
Certification	
	<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>
Electromagnetic compatibility	
	<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>

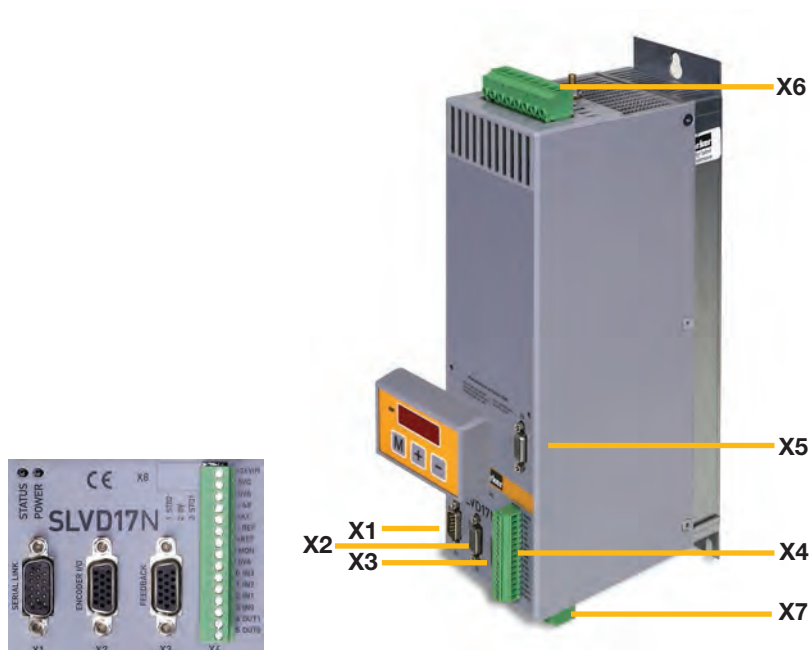


## Dimensions



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.



### 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



### Safety Option

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



### 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

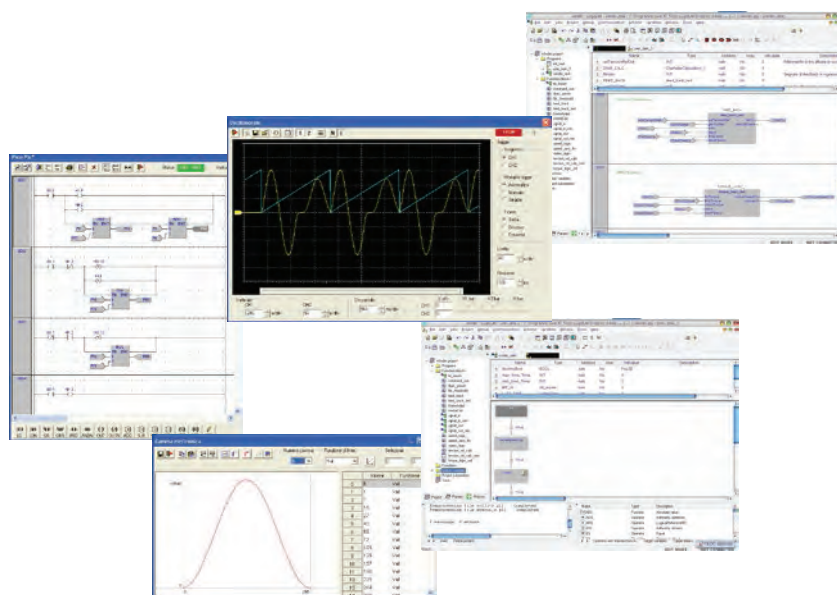
### MotionWiz and LogicLab

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>

<b>1</b>	<b>Servo family</b>	
	<b>SLVD</b>	Compact Digital Servodrive
<b>2</b>	<b>Drive size (nominal current)</b>	
	<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
<b>3</b>	<b>Version</b>	
	<b>N</b>	New version
<b>4</b>	<b>Protocol</b>	
	<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)

<b>5</b>	<b>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 sensor (from motor feedback)
	<b>F</b>	SinCos encoder input
<b>6</b>	<b>Optional boards</b>	
	<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
<b>7</b>	<b>Safety</b>	
	<b>Empty field</b>	without STO
	<b>R</b>	STO (Safe Torque Off function)
<b>8</b>	<b>Firmware review</b>	
	<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



## 北京润诚时代科技有限公司

地址：北京市朝阳区汤立路218号A座 301 室

电话：010-84450370

网址：[www.runcheng.net](http://www.runcheng.net)

邮箱：[runcheng\\_emd@sina.com](mailto:runcheng_emd@sina.com)

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