

# SYMAX

## Syringe Pump



SPETEC<sup>®</sup>  
SYMAX

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# SYMAX Spetec Syringe Pump

The Spetec syringe pump is used for metering fluids in the microliter and nanoliter range.

Its core components consist of the stepper motor drive, high-precision carriage, adjustable syringe holder, and replaceable syringe. Thanks to the high resolution of 25,600 steps per revolution, individual steps during the movement sequence are barely perceptible.

Both disposable and metal-free precision syringes of any required volume can be used. The smallest volume that can be delivered on each individual pulse when standard syringes are used is 4 picoliters. Depending on the size and diameter of the employed syringe, the total amount delivered per minute can be adjusted between 5 nl and 44 ml.

## Technical Data SYMAX

Mechanical Data	
Dimensions LxWxH (without syringe holder)	270 x 95 x 85 (mm)
Weight	2,100 g
Maximum stroke	91.5 mm
Minimum feed rate	0.248 nm/s
Maximum feed rate	1.24 mm/s
Smallest step resolution	0.0248 µm of feed
Accuracy	+/- 2%
Reproducibility	+/- 2%
Transverse force	100N at 0.0254 mm/s
Extendable	Up to six individually controllable channels per group; two groups can be operated from one PC
Materials	Anodized aluminum Powder-coated stainless steel Viton® (support for syringes)
Adjustable syringe holder	Permitted syringe diameters from 9 mm to 34 mm
Electrical Data	
Power supply	Input: 100–240V / 50–60 Hz Output: 24V / 2.5A
Power consumption per pump	Standby current: 210 mA Operating current: 420 mA
Data interfaces	RS 485 / USB
LabView	LLB ready for integration in user's own system
Operating Conditions	
Temperature range	+10 to +40°C
Relative humidity	20 % to 80 %, non-condensing
Suitable media	aqueous, acidic and alkaline media

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# SYMAX Features and Options

## Features:

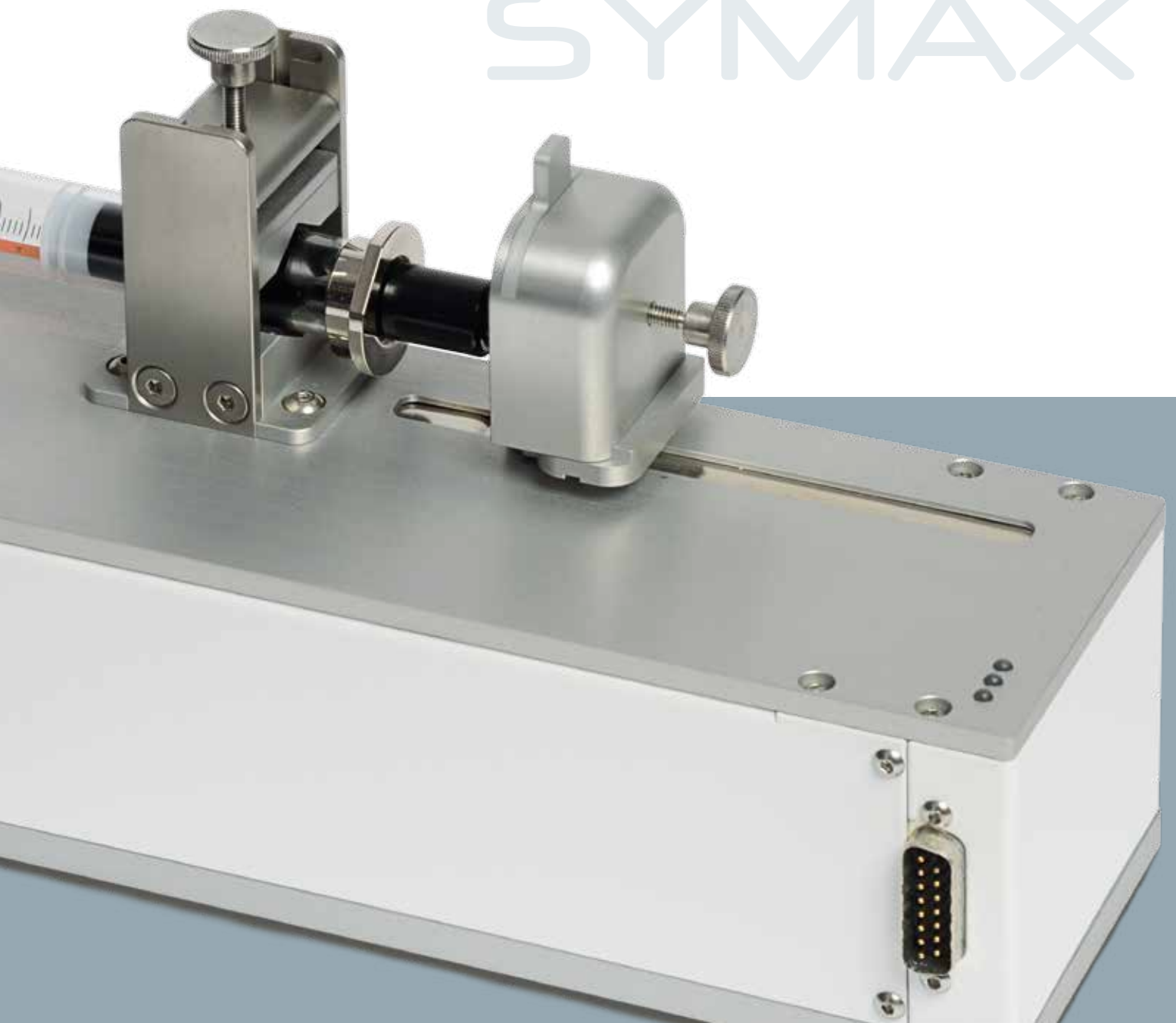
- Unrestricted choice of syringes thanks to adjustable syringe holder
- Custom syringes available on request
- Gearless stepper motor drive
- Control via PC software
- Automatic filling cycle (switched using controlled 3-way valve)
- Individual control of multiple pumps
- USB-RS485 interface
- LED status display

## Applications:

- Metering of microvolumes
- Long-term trials
- Extremely high-precision filling of fluids
- Horizontal and vertical operation possible

## Options

- Software-controlled 3-way valve for switching between filling and metering with current reduction for minimized heat generation
- Foot switch for starting metering operation



# SYMAX Software

## PC software:

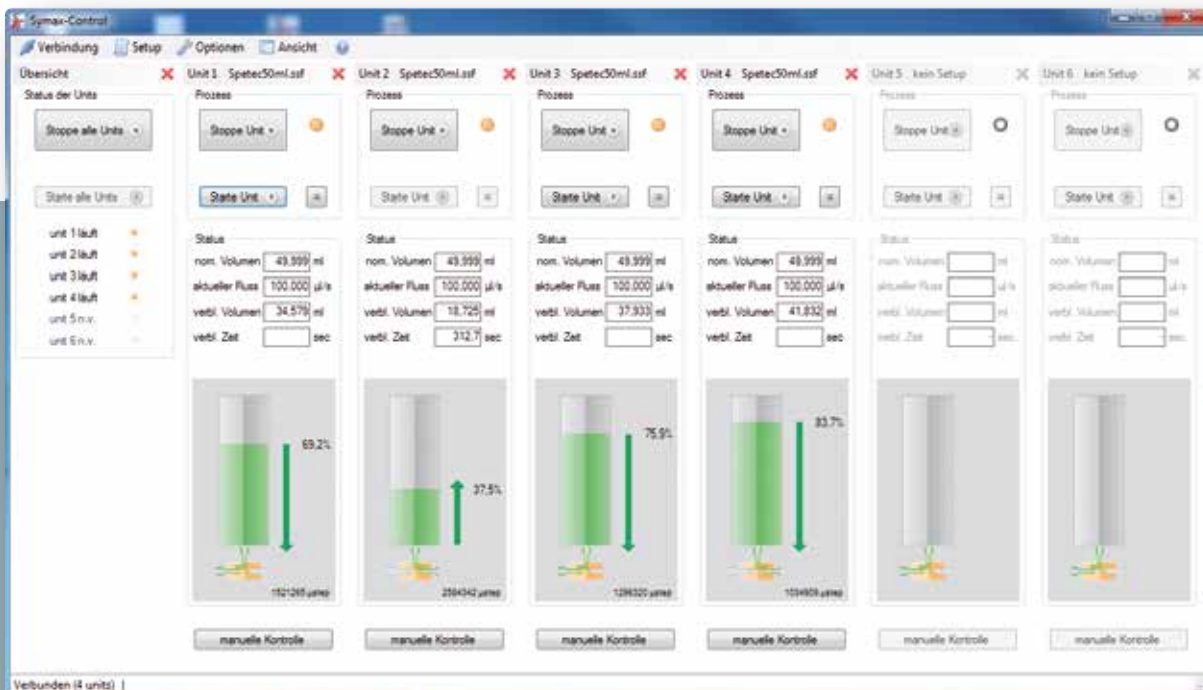
- Individual settings, can be saved if required
- Metering of defined volumes per unit of time
- Specification of absolute quantities and metering via trigger signal or foot switch
- Freely selectable metering speed
- Calculation of volumes for individual syringes
- Display of syringe volume and remaining volume
- Manual start/stop/fill
- Movement to reference position
- Feedback signal on termination of metering
- Languages: German, English

## Interface:

- Capable of interfacing with any USB port;  
System requirements: Windows XP, Windows 7 or Windows 8
- Open protocol for machine operation on request
- RS485 interface for machine control
- Three trigger inputs for predefined setups (start/stop/fill)
- One output (status: pump operating)
- LabView interface for creation of custom GUIs

## Settings:

- Individually configurable syringe set
- Specification of individual flows for metering and filling operations
- Continuous metering during a specified period (continuous flow)
- Configuration of one-shot fluid delivery (absolute quantity)
- Automatic repeat cycle with individually defined rest time and repetition rate settings
- Individual setting of syringe fill level
- Adaptable configuration of solenoid valve
- Up to 6 pumps can be operated and configured from the same user interface
- Manual control window for the manual transport of the syringe to the required position (bleeding of syringe)
- Software and firmware updates via Internet



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## Symax syringe pump with adjustable syringe holder

Consisting of	Order number 10-0102
• Symax syringe pump with adjustable syringe holder	
• Electrical connection kit	
• Operating instructions and software	
• USB interface	
• Power supply	
• USB cable	
• 5 ml PP syringe	



## Symax syringe pump for additional channels

Consisting of	Order number 10-0103
• Symax syringe pump with adjustable syringe holder	
• Usable as additional channel	
• 5 ml PP syringe	



# SYMAX Accessories

## Syringes

Order number	Volume	Material	Connector	Flow rates*		Minimum metered quantity*
				min	max	
10-0010	50 ml	PP	Luer-Lock	0.00015µl/s	755µl/s	0.015µl
10-0011	5 ml	PP	Luer-Lock	0.00003µl/s	150µl/s	0.029µl

\*theoretical values, may differ in the supplied syringe



## Valves

### Solenoid valve

#### Solenoid valve for neutral or aggressive fluids and gases in analytical and medical technology

- Hermetic separation of medium and internal components of solenoid valve:
  - No possibility of contamination by particles due to abrasion between moving parts.
  - High level of operational reliability is ensured when handling extremely aggressive media.

- The special wiper mechanism, in combination with the separating membrane, prevents the dissipation of heat into the medium and avoids adhesion around the valve seat

- Good self-emptying characteristics and easy to rinse

- Small internal volume

- Low heat generation thanks to integrated power-save circuit

#### General

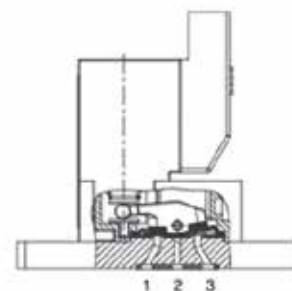
Pressure differential	-0.9 to 3 bar (can be used up to vacuum of 0.1 bar abs.)
Maximum viscosity	20 mm <sup>2</sup> /s
Internal volume	< 13 µl (without connectors)
Connector	¼ - 28 UNF

#### Components in contact with medium

Housing	PEEK
Membrane	FFPM (EPDM, FPM)
Seals	FFPM (EPDM, FPM)

#### Electrical Data

Voltage	DC 24V
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### Non-return valve

• Non-return valve with 1/8" hose connector	
• For the transfer of fluids or gases in a vacuum or under pressure	
• Polypropylene (PP) body with viton valve	
• Operates in any position	
• Opening pressure:	13 mbar
• Internal volume:	0.13 ml
• Maximum pressure:	Fluids 1 bar, air 3 bar



## Set of tubing

## Order number

Teflon set of tubing	10-0082
<ul style="list-style-type: none"> <li>• Three pieces of Teflon tubing, approx. 30cm with fitting</li> </ul>	
<ul style="list-style-type: none"> <li>• One Luer-Lock fitting connector to connect syringes with Luer and Luer-Lock fittings</li> </ul>	
<ul style="list-style-type: none"> <li>• Fittings possess ¼ – 28UNF threads for connection to user's system</li> </ul>	
<ul style="list-style-type: none"> <li>• Teflon tubing ID=0.75mm</li> </ul>	
PVC tubing set valve	10-0081
<ul style="list-style-type: none"> <li>• 3 m PVC tubing ID=2.79mm</li> </ul>	
<ul style="list-style-type: none"> <li>• Two non-return valve with 1/8" tubing connector</li> </ul>	
<ul style="list-style-type: none"> <li>• One Luer-Lock tubing connector to connect syringes with Luer and Luer-Lock fittings</li> </ul>	
3-way valve set	10-0080
<ul style="list-style-type: none"> <li>• Solenoid valve</li> </ul>	
<ul style="list-style-type: none"> <li>• Mounting block to bolt the valve to the pump</li> </ul>	
<ul style="list-style-type: none"> <li>• PEEK base unit with ¼ – 28UNF thread connections, optimally used together with Teflon tubing set</li> </ul>	
<ul style="list-style-type: none"> <li>• Equipped with 1/8" tubing connector as standard</li> </ul>	
Electrical connection kit	10-0060
<ul style="list-style-type: none"> <li>• Operating instructions and software</li> </ul>	
<ul style="list-style-type: none"> <li>• USB interface</li> </ul>	
<ul style="list-style-type: none"> <li>• Power supply, input: 100–240V AC / 50–60Hz, output: 24V DC / 2.8A</li> </ul>	
<ul style="list-style-type: none"> <li>• USB cable</li> </ul>	
Foot switch	10-0050
<ul style="list-style-type: none"> <li>• Connection to pump's trigger input (closing contact)</li> </ul>	
<ul style="list-style-type: none"> <li>• When the pump has been configured at the PC, it can be operated using a start trigger</li> </ul>	
Connecting cable, 1m	10-0061
<ul style="list-style-type: none"> <li>• Cable used to connect two Symax pumps that are not mechanically coupled but are located at a distance of up to 1 m from one another.</li> </ul>	
<ul style="list-style-type: none"> <li>• Cable end 1: Sub-D Female</li> </ul>	
<ul style="list-style-type: none"> <li>• Cable end 2: Sub-D Male</li> </ul>	
OEM network cable, 2m	10-0062
<ul style="list-style-type: none"> <li>• Cable for connection to user's own power supply (24V / 2.8A) and interface</li> </ul>	
<ul style="list-style-type: none"> <li>• The pump can be operated without the electrical connection kit at the user's own RS485 interface</li> </ul>	
<ul style="list-style-type: none"> <li>• The trigger signals can also be introduced</li> </ul>	
<ul style="list-style-type: none"> <li>• Cable end 1: Sub-D Female</li> </ul>	
<ul style="list-style-type: none"> <li>• Cable end 2: non-terminated cable for custom wiring</li> </ul>	
OEM trigger cable, 2m	10-0063
<ul style="list-style-type: none"> <li>• Cable for connection to user's own controller via trigger signals (3 closing contacts: meter/fill/stop; 1 output: pump operating)</li> </ul>	
<ul style="list-style-type: none"> <li>• Cable end 1: Sub-D Male</li> </ul>	
<ul style="list-style-type: none"> <li>• Cable end 2: non-terminated cable for custom wiring</li> </ul>	

# SYMAX

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