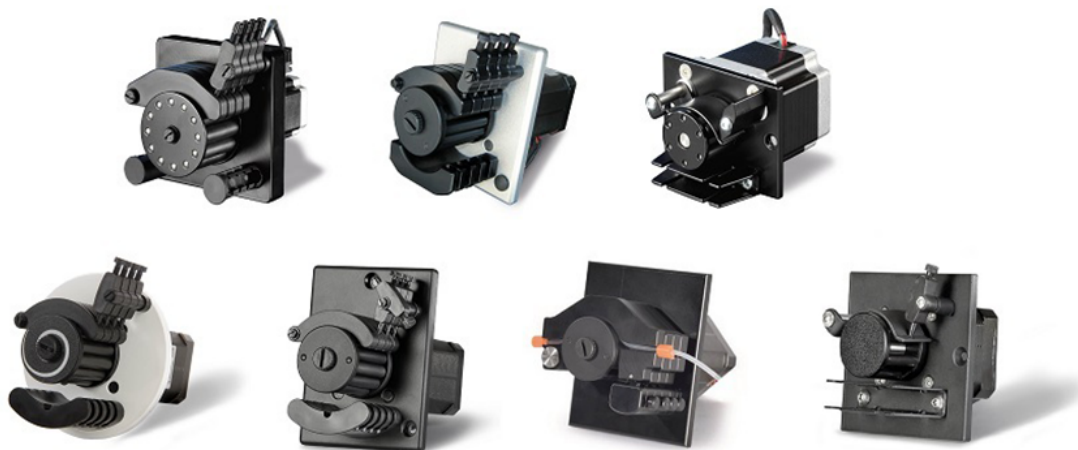


home > Tech & Analysis > Industry news



Custom-built peristaltic pumps from Spetec

NOVEMBER 17 2022

Individual, extremely reliable and offering outstanding precision for chemical analyses and process technology

Introduction:

Peristaltic pumps are also referred to as hose or tube pumps because they are based on the principle of deforming a tube in order to create a suction effect. This mode of operation is often compared to that of the human esophagus. The word “peristaltic” is of Greek origin and the muscle contractions that occur in the digestive tract also bear the name “peristalsis”. The task of a peristaltic pump is to transport fluids in a predefined direction. In this process, the tube is alternately compressed and released in order to suck the fluid that is to be transported into it. A shoe or roller travels along the tube and squeezes it closed. This creates a seal between the suction side and outlet side of the pump and this also helps prevent any loss of fluid. When the tube returns to its original shape, a vacuum is formed and induces a flow of fluid into the pump. Due to this mode of pump action, peristaltic pumps are ideally suited for precision metering and continuous feed applications. The transported fluid does not come into contact with any moving parts. Instead it travels through the tube, which must be chosen correctly and replaced as required. Peristaltic pumps can be equipped with between 1 and 6 channels depending on type. The number of rollers is a criterion contributing to a constant, low-pulsation flow rate. Depending on the size of the pump head and the tubing, it is possible to achieve flow rates from the $\mu\text{L}/\text{min}$ through to the L/min range.

1 Use in research

Lab



For more than 30 years, Erding-based SPETEC Gesellschaft für Labor- und Reinraumtechnik mbH has been designing and building peristaltic pumps for an enormous range of applications. It also manufactures the required tubing, which must be as inert as possible in contact with solvents or acids and should have a long service life.

Applications in these fields demand precision metering, an extremely stable technical process flow and, depending on the intended use, the lowest possible level of pulsation. These are the criteria underpinning the design of the two laboratory pump variants Perimax 12 and Perimax 16, which differ only in the number of rollers (12/16) in the pump head and the continuously adjustable flow rates they can achieve (0.0017 mL/min to 20 mL/min against 0.0034 mL/min to 40 mL/min). The 16-roller pump produces no measurable pulsation.

Perimax pumps have proven their value for instrumental analyses and are also used in the fields of biotechnology and bio-analytics, as well as in liquid and column chromatography applications, inductively coupled plasma emission spectrometry (ICP) and atomic absorption spectrometry (AAS). One reason for this is the ease of use of the pumps. The tube is guided around the pump head and its two ends are fixed to a special mechanism. The compression level can be set using the adjusting screw at the adjusting lever. The pump is switched on and off and the direction of rotation (left or right) is selected using pushbuttons. The speed of rotation of the pump head is continuously adjustable using a 10-turn potentiometer. The pump speed and fluid flow rate can be seen at a digital display. A button is available to briefly activate the highest operating speed, for example for the rapid rinsing of the tubing when switching over to a different fluid.

The drive unit used in the two pumps is identical. A stepper motor ensures constant fluid transport. Analog control (0-5 V) of the pump speed and operating direction is possible via a connector on the rear.

2. Custom-built OEM pump versions

One great advantage of Spetec's peristaltic pumps is that they are not manufactured as series products. Only a small number of basic components are identical, such as the roller heads, pressure brackets or tube holders, all of which are manufactured in large quantities to help minimize cost. Because these pumps are constructed for use in another manufacturer's end products – i.e. they are intended for the OEM sector (Original Equipment Manufacturer) – they are custom-built by SPETEC. This means that each pump is developed to meet the customer's requirements in terms of visual design. This applies to the color and geometry of the baseplate on which the 1 to 4-channel pump is fitted, as well as to the basic components whose coloring is also harmonized with the device in which the pump is to be installed. This ensures fidelity to the design of the OEM equipment. Designed to customer requirements, the baseplate can be fitted directly to the housing of the analysis unit as a complete assembly or can be integrated in the device construction. This means that the custom-built peristaltic pumps can be installed more easily and economically during final assembly of analysis units. There are consequently

Lab

differ

ng ac



e seen in the various brochures, and new designs

cept not only takes account of the individual

requirements placed on its peristaltic pumps but also gives them their own specific, attractive appearance.

In all the models, the drive unit is constructed using a stepper motors, with the aim of achieving the greatest possible stability in terms of pump speed and flow rate, as well as the lowest possible pulsation level.

Summary:

Peristaltic pumps, which are also known as tube/hose pumps or positive-displacement pumps, can now be manufactured in outstandingly high quality. Because the generation of the suction vacuum depends to a very great extent on the selected tubing material, this is of crucial importance in guaranteeing a constant, low-pulsation fluid flow. Beside the quality of the tubing material and the type of fluid to be transported, the diameter of the pump head and the pressure rollers also has a considerable impact on the service life of the tubing. By choosing the correct design parameters, it is therefore possible to greatly prolong the tube lifetime, while also ensuring that the flow rate remains constant for longer and keeping pulsation levels to an absolute minimum. Thanks to its decades of production experience, Spetec has acquired the necessary expertise in the design and selection of the tubing material.

www.spetec.de

Lab



Written by [Spetec GmbH](#)

SHARE THIS ARTICLE

PERISTALTIC PUMP

PUMPS

Part of the theme

Tech & Analysis

1012 ARTICLES 6 EXPERTS



WRITTEN BY

Spetec GmbH

Spetec was founded in Erding, Germany in 1987. The company began selling replacement parts for analytics. As requirements **in analytics** becam...

MORE INFORMATION

Labinsights

Everything about the lab industry



[Home](#)

[Suppliers](#)

[Jobs](#)

[Events](#)

[Magazine](#)

[About us](#)

[Contact](#)

[Advertising](#)

[Subscribe](#)

Also visit

[LABinsights.nl](#)

[LABinsights.de](#)

[Disclaimer](#)

[Privacystatement](#)