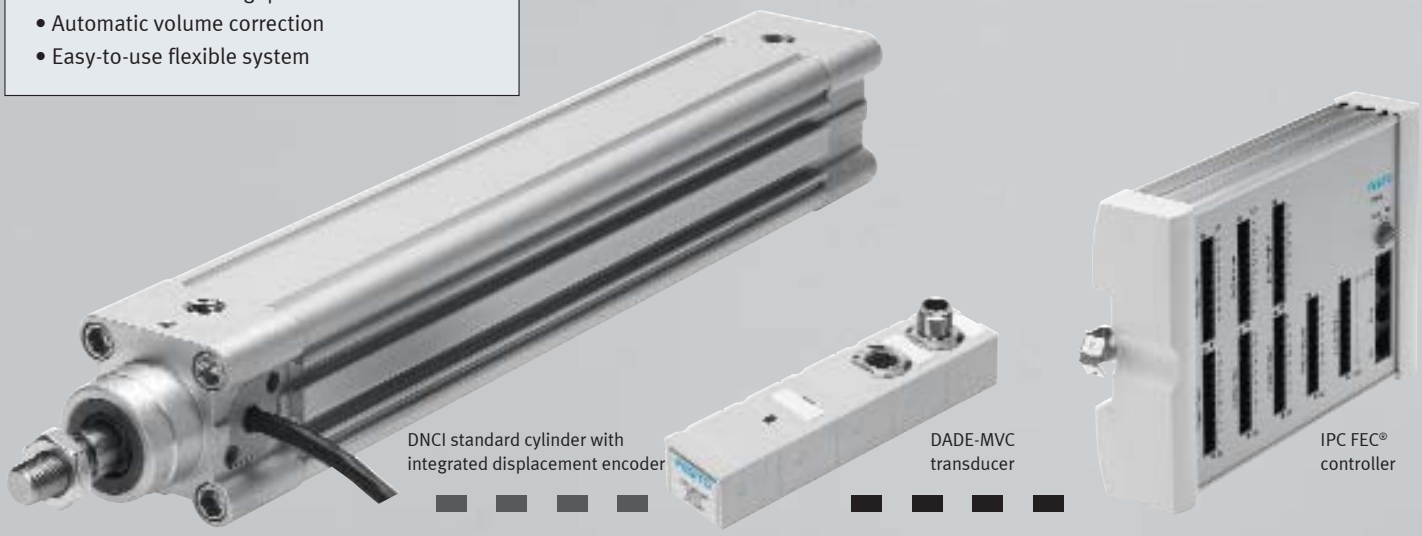
HAV semi-automatic filling machine for short production runs

Areas of applications
Filling and dosing. clamping and measurement, position-dependent application of glue or other liquids, press-fitting with inspection of press depth, inspection of surface properties and bending

Benefits
- Precise data on filling quantities
- Automatic volume correction
- Easy-to-use flexible system



DNCI standard cylinder with integrated displacement encoder

DADE-MVC transducer

IPC FEC® controller

The right measure

Shampoo, engine oil or antifreeze: The Belgian company Sneyders Machinenconstructie NV is concerned with filling liquids to millimetre accuracy. Naturally quality and process reliability are vital factors in the production of the necessary machines. A Festo DNCI standard cylinder with an integrated displacement encoder ensures that not a drop too few or too many goes into the packaging material during the filling operation.

What does the position of the piston rod of a pneumatic cylinder have to do with quality and process reliability in production operations? A great deal, as the Belgian manufacturer of filling and sealing machines Sneyders knows very well. This company uses piston-position data to monitor filling levels within dosing and filling processes. Sneyders has developed its HAV semi-automatic filling machine specially for use with small filling quantities. This machine is very easy to use and is particularly suitable for short production runs – for example in the cosmetics industry.

Full to the brim
No matter whether the products concerned are low or high viscosity, the HAV machine carries out precise dosing using the above-surface filling method and ensures that each package contains exactly the desired quantity- with a consistent repetition accuracy of better than 0.3 %. Engine oil and liquid soaps, for example, are delivered to the filling plant in large drums. In the filling operation, a drum is placed at a low point to allow better take-up of the liquid concerned. This is fed via a plastic tube into a glass cylinder. From here, it passes into the ready-positioned packaging, if desired through an optional pneumatically-closable filling nozzle which ensures 100 % drip-free operation. The transparent cylinder provides a clear view of the filling volume, which on Sneyders machines is controlled electronically. The machine can deliver between 50 and 10,000 ml. An additional setting allows several filling volumes to be pumped into larger containers using numerous strokes.

Two in one
At the heart of the semi-automatic filling machines is a Festo DNCI piston-rod cylinder with an integrated displacement encoder system. This cylinder is certified in accordance with ISO 6431, offers very high repetition accuracy and has

allowed Sneyders to dispense with the mechanical adjustments outside the machine which were previously required. In combination with a DADE-MVC transducer, the DNCI offers movement and measurement in a single component. This means no more need for awkward attachments at the top or sides. This cylinder can be installed very easily using the comprehensive range of accessories from Festo's modular DNC system and needs no external cable loop thanks to the fixed measuring head.

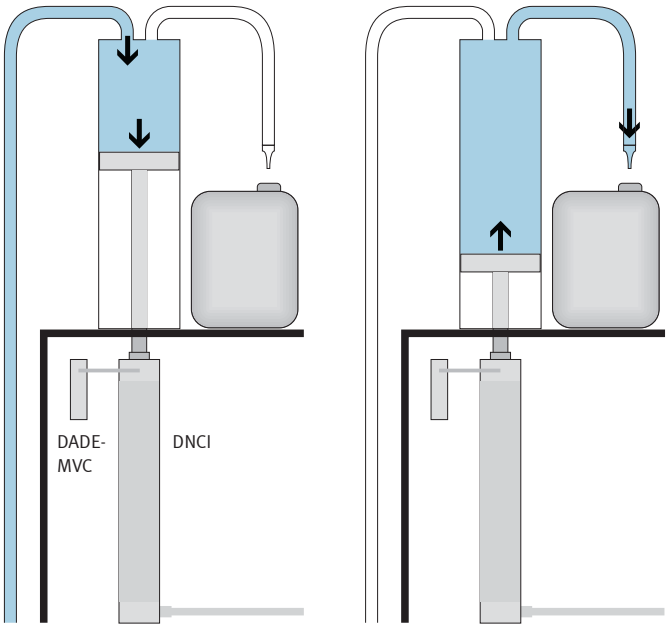
Installed underneath the filling machine, the piston rod of the DNCI drives presses the piston in the glass cylinder upwards. In this way, shampoo, antifreeze or other products are pressed via a tube into the desired packaging. With a 400 mm stroke, the repetition accuracy achieved is ±0.1 mm.

Not a millilitre too much ...

... not a millilitre too little is delivered in this way. Once the specified filling volume has been reached, the cylinder piston stops and the liquid remains in the glass cylinder until a fresh empty package is in position. The DNCI and displacement encoder mean that there is better monitoring of the filling process on the semi-automatic filling machine, which is an advantage particularly with regard to quality assurance and process reliability. The DADE-MVC transducer converts the sensor signal from the DNCI cylinder into an analogue voltage or current signal and is perfectly matched to the characteristics of the drive. For example, if the filling speed changes, the volume is automatically corrected. This advantage does not merely apply to filling operations, since this piston-rod drive can also be used to excellent effect with automatic gluing machines, as a deflector actuator or as a pusher cylinder in production operations.

Measured cooperation

Sneyders needed an interchangeable system with the properties of a standard cylinder which would provide the necessary flexibility for dosing and filling applications. Thanks to the integrated displacement encoder – with a measuring head in the bearing cap and measuring strips on the piston rod – Sneyders now has access to ultra-precise filling-volume data. Settings can be made to millilitre accuracy, which "made the Festo solution not only less expensive but also easier to use than the old mechanical system," says Peter Sneyders, the company owner.



Working to millimetre accuracy – a DNCI standard cylinder with integrated displacement encoder on a Sneyders HAV with a semi-automatic filling machine.

Technical data

DNCI standard cylinder
- Sizes: 32, 40, 50, 63 mm
- Stroke lengths: 10 ... 2.000 mm
- Variants:
  – Through piston rod
  – Clamping cartridge
  – Extended piston rod
- Degree of protection: IP65
- Guide unit with ball-bearing guide

DADE-MVC transducer
- Signal output: Voltage variant 0 ... 10V or current variant 4 ... 20 mA
- Degree of protection: IP65/IP67
- Fault display via LED (green/red)