



Flow controller VEAD for CDA and inert gases



Highlights

- Reduced total cost of ownership
- Almost free of particles
- Reliable and simple solution
- Very precise, no hysteresis
- Very low energy consumption thanks to piezo valves
- Compact
- Only two pneumatic connections = minimised risk of leakages
- Long lasting service life

With N₂ purge systems you are on the safe side. For instance when wafers need to be transported and stored in the semiconductor industry. The highly affordable, pre-assembled flow controller continuously supplies the wafer reservoir (FOUP) with inert nitrogen, thus preventing oxygen from oxidising the wafers.

Guaranteed and tested

The performance of the pre-assembled functional unit has been tested, so that we can guarantee its functional reliability. Compared to individual components, the highly affordable unit not only saves assembly and test time but also reduces the costs for an extra stainless steel tube with fittings.

Compact and leak-proof

The compact flow controller has just two pneumatic connections, significantly reducing the risk of leakages. The operation of the integrated piezo valve is almost free of wear, ensuring an incredibly long service life. And abrasion is absolutely minimal: less than 1 particle of size 0.1 µm per switching cycle on/off. The energy consumption is also <1 W. That is 80 % less than with conventional solutions in both cases.

Stable, linear, precise

The closed control loop ensures a highly accurate, stable and linear behaviour of the flow rate – without hysteresis. The repetition accuracy is ±0.25 % of the setpoint value.



Additional informations:

Product page

> www.festo.com/catalogue/vead



Clever technology

1 Flow controller N₂

Each individual FOUP storage and buffer space contains a flow controller, consisting of a 2/2-way proportional valve and a flow sensor. The integrated electronics include:

- 1) The power supply
- 2) The high-voltage technology for the piezo bender plus a stable and precise control loop for the integrated sensor, as well as
- 3) The piezo proportional control valve.

During the process, the electronics continuously control the flow rate in line with the setpoint value. The solution from Festo takes on this control function. The modified, energy-saving piezo valve VEMR ensures a repeat accurate flow rate of 25 l_n/min over the entire service life. Up to 30 l_n/min are possible in the short term.

Long service life, no wear

The design of the piezo valve significantly reduces the risk of contamination in the gas flow caused by particle abrasion over the entire service life. The peak value is approximately for a particle of size 0.1 µm per switching cycle. Conventional solutions generate five times the particle content. The piezo technology used prevents wear due to friction, considerably lengthening the service life of the valve. In comparison to conventional

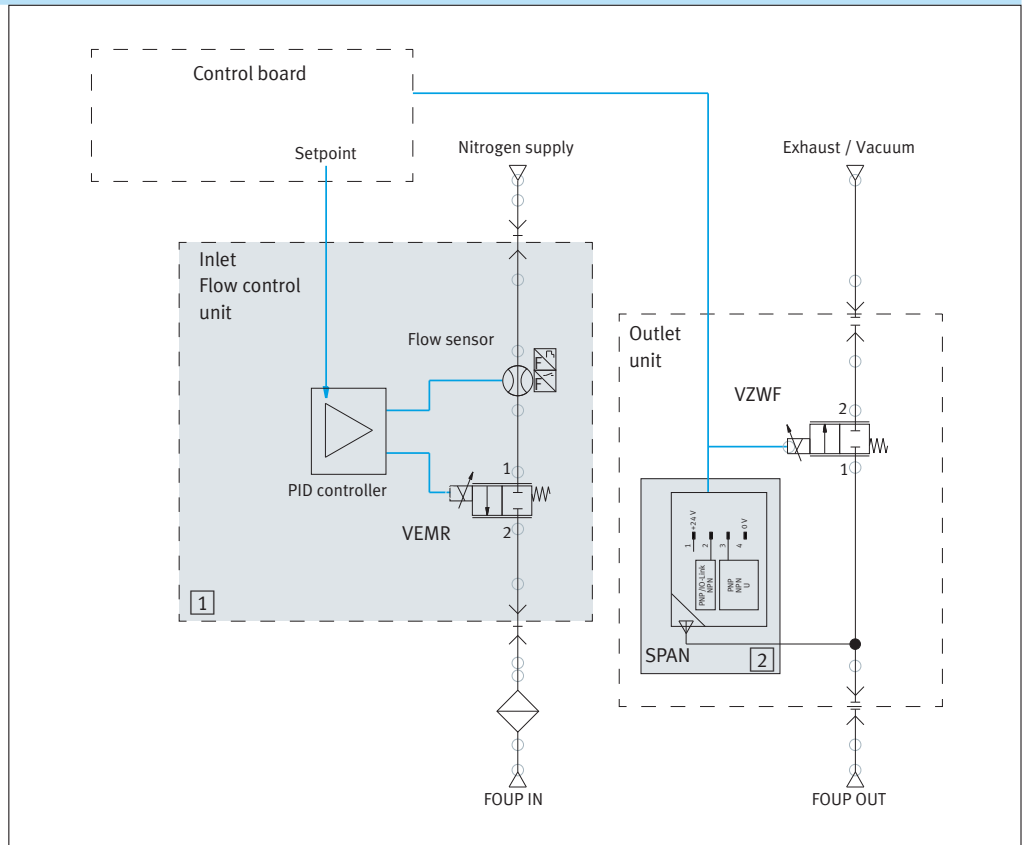
solutions, this results in significant savings in operation and maintenance.

Extremely economical energy consumption, no hysteresis

Piezo valves have a very low power consumption of <1 W. This is only about 20 % of the energy consumed by conventional proportional control valves. That means substantial savings in energy costs. In addition, the piezo valves in the control loop also ensure a very stable and linear behaviour of the flow rate without any hysteresis.

(2) Solution for the outlet

The pressure at the outlet of the FOUP is monitored by a pressure sensor SPAN, which works in the 10 kPa range. Festo provides a separate solution description for this.



Functional diagram of an N₂ purge system



Product overview

Piezo valve VEMR

Display

Visual display of the flow rate
value in l/min

Mechanical interface

- Sturdy and easy to modify for various fittings
- No need for extra tubing and reduced assembly costs
- Reduces the risk of leakages



Affordable to buy and operate – quick and easy to mount

The Festo N₂ purge system is optimally matched with the requirements and framework conditions of modern semiconductor production. Both the generally restricted space in the production area as well as the strict quality demands for the operating equipment have been

taken into consideration in this highly integrated system solution. What's more, the solution from Festo also offers decisive advantages that meet the cost awareness associated with the short innovation cycles in the electronics industry. The system is very affordable to buy and

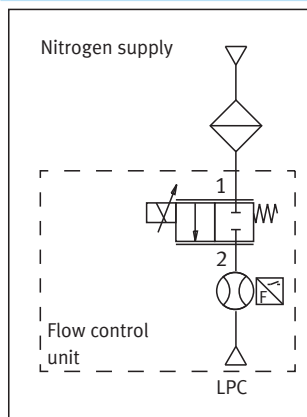
operate, while the costs for assembly and tubing are also much reduced. The same is true for test times, since you receive a pre-assembled functional unit instead of several individual components.

The flow controller can also be integrated in an overhead transport system to reliably transport wafers.

See for yourself – and ask for a quote!

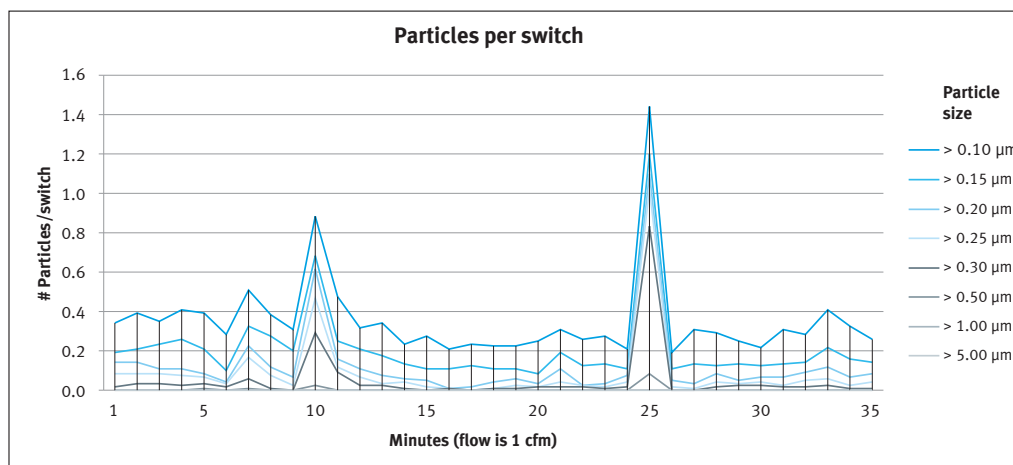


Ideal for cleanrooms



Line / Component	P-N2 / V3
Sampling Method	Full Sampling
Total Sampling Volume [l]	1018,8
Average > 0,1 µm	0,2
Peak value	1,1
Average >1,0 µm	0,0
Average Limit	5
Peak Limit	40

Result	OK
Counter Type	LPC
Manufacturer of counter	PMS
Counter Model	Lasair III
Test gas	CDA
Background Count	0
Smallest particle size [µm]	0,1



Design Flow

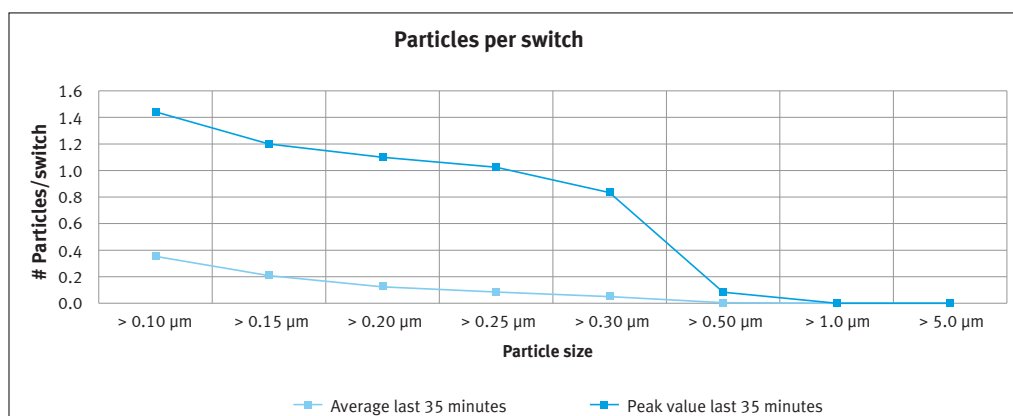
26 l_n/min

Test Flow (in valve open state)

26 l_n/min

Frequency

120 switches/min



Class identification

at 6 switches/min

ISO class (ISO 14644-1)

3

ISO class (ISO 8573-2001)

2

ISO class (ISO 8573-2010)

1

Volume

2,1667 l

Sampling Flow

28,3 l_n/min

Pressure

100 kPa

Technical data

Flow rate [l _n /min]	25
Control precision [l _n /min]	<±1,5 @ 25
Accuracy of flow sensor [l _n /min]	<2
Repetition accuracy	±0,25 % of the setpoint value
Repetition accuracy of flow sensor	+3 % of the scale value