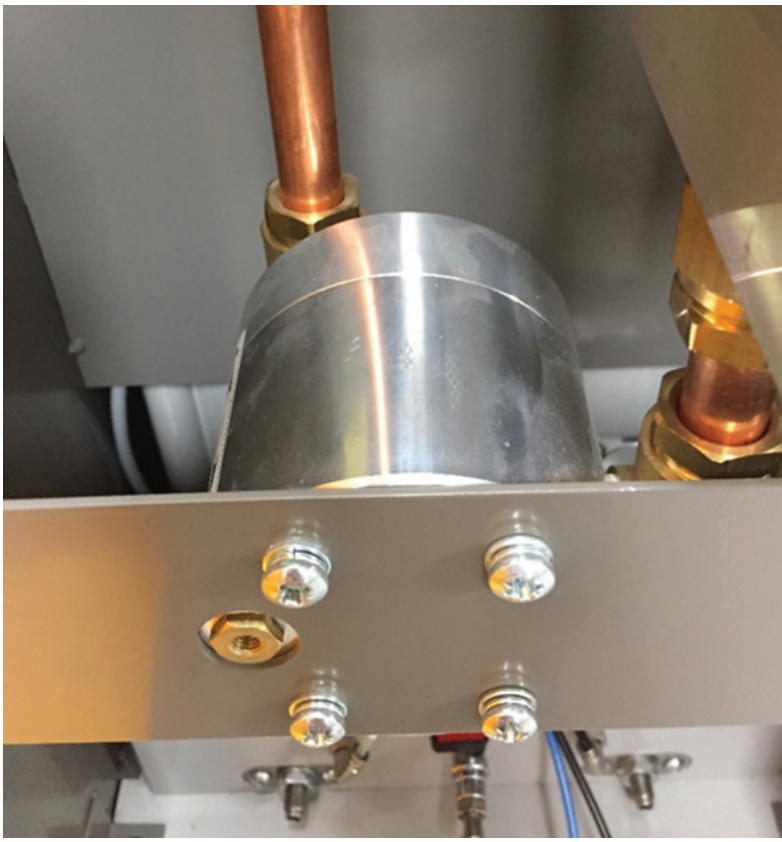
Mass Flow Controller

Fact Sheet



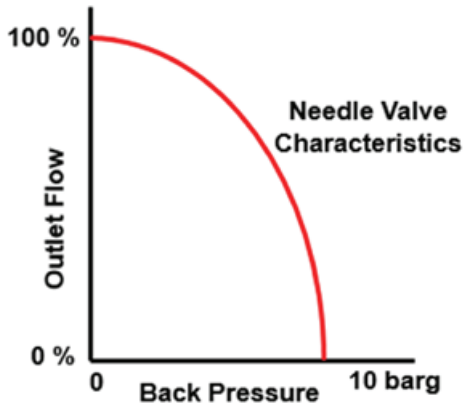
Parker NITROSource and NITROSource Compact nitrogen gas generators use a device on the output gas stream called a Mass Flow Controller, (MFC).



What is the purpose of the MFC and how does it work?

To ensure a stable nitrogen purity with regards to maximum remaining oxygen content, it is very important that the inlet compressed air has a constant velocity and contact time with the carbon molecular sieve so that oxygen absorption is consistent. If there were a sudden demand for nitrogen gas exceeding the generators design capacity for the given pressure and purity, then this might create a higher air velocity across the CMS beds causing less oxygen to be adsorbed and hence a lower purity than required. If maintained for a period of time, it could also cause a high oxygen alarm situation to be triggered on the generator controller.w

One solution is to use a needle or globe type flow control valve. The main draw-back of these types of devices is that they are very pressure dependent, both down-stream and up stream, to ensure a constant set flow and can therefore vary in their control of the nitrogen flow considerably. This is undesirable because it can cause fluctuating flow and purity to the application or process.



The diagram depicts the effect of back-pressure from the down-stream application on output nitrogen flow. As can be seen, when the back pressure increases, the flow decreases. Even a small change can cause a big drop in flow.

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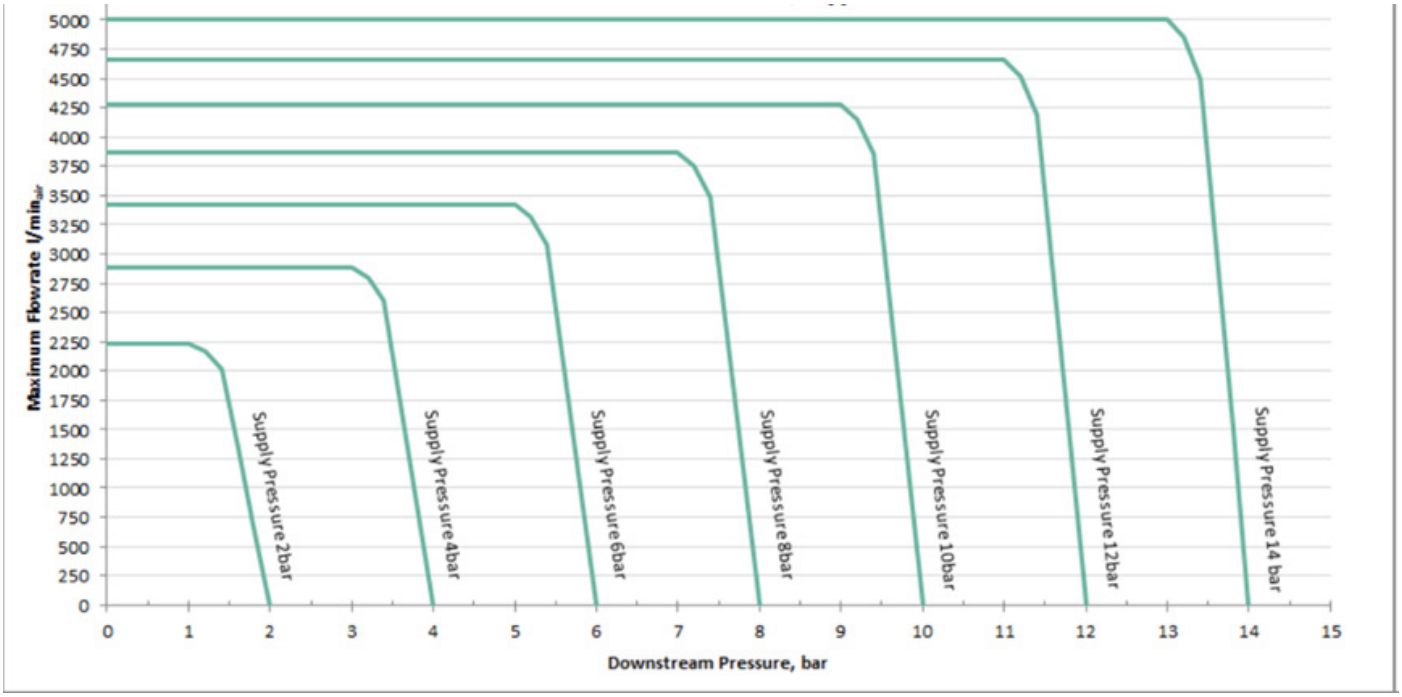

The image above depicts the characteristics of the mass flow control device fitted integrally to Parker nitrogen generators.

As can be seen, regardless of back pressure the outlet flow remains stable at the setpoint. Only for the last 1-0.5 barg does the flow begin to reduce.

This creates a very stable flow, pressure and purity for the application or process.

In summary the Mass Flow Control Device installed within Parker NITROSource PSA and NITROSource Compact nitrogen gas generators –

1. Maintains a stable and constant outlet flow regardless of application pressure and flow demands.
2. Prevents the CMS from being over-flowed, potentially causing a degradation in purity.
3. Prevents purity alarm conditions causing down-time.
4. Protects the CMS beds from high gas velocity, preventing CMS attrition, wear and premature failure.
5. Protects the application or process from fluctuating flows and pressures.
6. Helps achieve maximum up-time of the generator and maximum productivity of the application or process.

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