



DIFFUSERS



AXCES

Steam and Flow Control

THE SOUND OF SILENCE BECOMING AXCES STEAM AND FLOW CONTROL

Q.E. International B.V. was established in 1979. In April 2019, Q.E. International B.V. was acquired by The Axces Group. The official company name after this point will become Axces Steam and Flow Control B.V. while the trade name will remain Q.E. International.

Axces Steam and Flow Control (ASFC) is the expert on working towards a quieter and safer industrial environment. With innovative solutions in the field of noise, vibration, and pulsation, ASFC sets a higher standard than the competition. Solving a broad range of noise pollution issues worldwide built a reputation suitable for an international organisation. Custom products ensure that the noise pollution problems are dealt with adequately.



The knowledge is broad and safety is important. ASFC helps your company with handling precision equipment, calculations, legal requirements, and mandatory approval.

MISSION

Strive to be the expert in the field of noise, vibration, and pulsation. More than 35 years of experience has evolved into more innovative solutions and raising the bar of the competitors. We are providing the best results through custom-made products.

VISION

Our goal is to create a carefree, helpful, and understanding environment for our customers. Expect nothing less than the best quality, attention, and expertise. Our motivation is to deliver excellence through our experience. We thrive to establish a long-term relationship with all of our customers.

SUPPLIERS

We always select our suppliers carefully therefore, we only work with the best in the industry. Our suppliers are encouraged to be creative and innovative and to work on building a long-term relationship with us. That is why we can ensure quality and dedication to our customers.

ENVIRONMENT

The environment is one of our most important responsibilities. A safer and healthier environment is our goal and we are working towards that on a daily base. Therefore, we committed ourselves to the strict environmental rules of ISO 14001.



QUALITY

Quality means a lot to us. We are proud that we hold various certificates, which demonstrate how important quality standards are for Axces Steam and Flow Control. A result of this is that we are considered a pioneer in the market.

CUSTOM DESIGNS

ASFC has also specialized in the designs of silencers to comply with customer specifications. The extended experience is at your disposal in solving complex noise problems and in the translation of extreme demands into practical solutions and our continuing drive to be leaders in our chosen fields is evidenced by the successes that they have demonstrated. ASFC produces various industrial silencers and provides advice according to the customer's wishes.

DIFFUSERS

INTRODUCTION

Pressure reduction in gas or steam networks is often achieved by control valves, frequently accompanied by high levels of noise generation. Pressure reduction over several stages also reduces the generated noise. Axces Steam and Flow Control have an excellent solution for this in the form of noise attenuating diffusers located immediately downstream from the control valve. This method of noise attenuation is compact, efficient and demands no maintenance.



GENERATED NOISE

Choking flow in a gas stream leads to high internal velocities. The sudden speed and pressure changes excite acoustic waves. These may have very high sound power levels, 160 decibel is not uncommon, that propagate through the walls of the valve and of the downstream piping. The system pressure, pressure drop, and gas velocity among other things influence the excited noise level. Fitting a downstream diffuser reduces the pressure drop across the valve with a commensurate reduction in generated noise.

NOISE ATTENUATION IN THE DIFFUSER

The attenuation in the diffuser is achieved in the following steps:

- ✓ *Noise entering the diffuser is partially reflected. The proportions of the diffuser determine this effect.*
- ✓ *The openings in the diffuser force the production of small gas jets which mutually interfere so attenuating noise further*
- ✓ *The noise spectrum is altered. Low-frequency noise being transformed to the higher frequencies that are more efficiently impeded by the pipe wall.*

CONSTRUCTION

The gas or vapor leaving the control valve enters the diffuser and flows through a special pattern of openings towards the downstream piping. When higher pressures are present several stages of orifices are built into the diffuser. To aid fitting into the piping system a selection may be made out of many different geometries. Flanged connections to any normal specification, weld-prepared ends for field butt-welding are amongst the options.

The degree of noise attenuation rests upon the number, dimensions, and arrangement of the internal orifices in each stage. Since these also affect the overall pressure drop a precise balance is made between pressure drop and noise generation. ASFC has developed its calculation methods to determine this balance.

The pressure containing envelope will fall under local Pressure Vessel ordinances compliance. ASFC design engineers are versed with these regulations so that the completed diffuser will meet the international requirements of either PED 97/23/EC or ASME VIII Division 1.

VALVE LIFE

An added advantage of the diffuser is its effect upon increasing the useful life of the valve by reducing the internal vibrations so reducing the loading on the valve internals. In those situations where valves are located close to the plant boundary or are in a zone having stringent noise limitations, additional external acoustic insulation is fitted.

SUMMARY

A diffuser changes the distribution of pressure drop between the valve and the downstream system. The orifices (openings) in the diffuser determine the pressure drop across each diffuser element and the frequency of the residual noise.

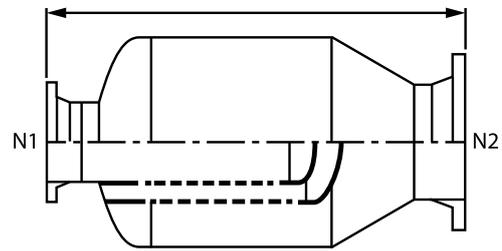
The final design of a diffuser depends upon the number of stages it comprises the design pressure, the design temperature, and the type of gas or vapor being transmitted. ASFC diffusers have been used, for many years, by several valve manufacturers throughout the world.

ASFC's expertise in this field is at your disposal. We will be pleased to advise your staff of the best proposal for your application. To make a firm offer the following data is needed:

- ✓ *Gas or vapor type*
- ✓ *Pressure upstream of the control valve*
- ✓ *Pressure downstream from the valve/diffuser system*
- ✓ *Temperature of the flowing medium*
- ✓ *Unsilenced noise level inside the valve*
- ✓ *Connection sizes*

ASFC YOUR PARTNER IN INDUSTRIAL NOISE REDUCTION

In short, with more than 40 years of experience ASFC has demonstrated to its loyal and satisfied clients that it is the partner in solving industrial noise problems and we can perform the same services for your organization. Our advisors will be pleased to confer with you to find the most effective and economical approach to your problem.



Typical cross-section of an ASFC two-stage controlled pressure diffuser



View into the interior of an ASFC controlled-pressure diffuser from the downstream connection.



THE AXCES GROUP

The Axces Group designs and manufactures industrial exhaust systems, silencers and chimneys including flue gas cleaning systems as well as acoustic enclosures, steel structures and steel products.

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