

# GLAUNACH

## THE SILENCER HANDBOOK

### SILENCERS

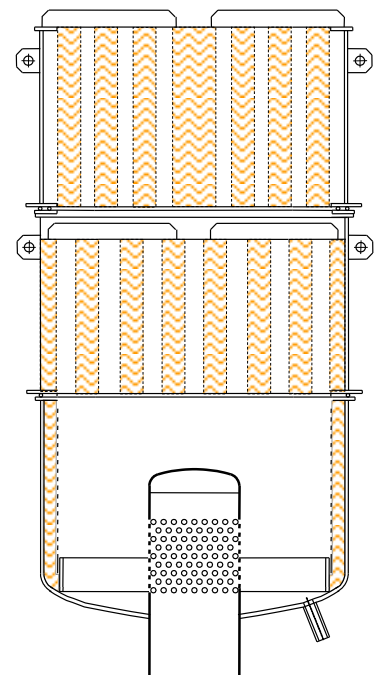
*AN OVERVIEW OF OUR PRODUCT PORTFOLIO*



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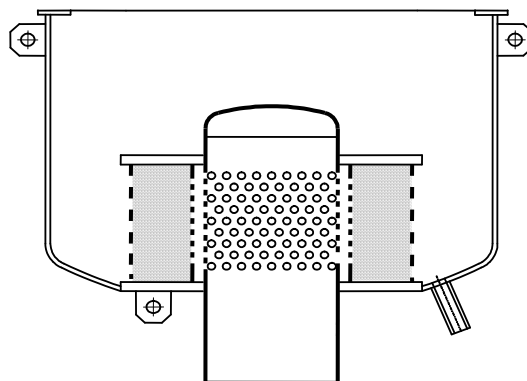
## ABSORBING SILENCER

<i>type</i>	<b>A</b>
<i>typical applications</i>	<input type="checkbox"/> any vent or blow-down application <input type="checkbox"/> boiler start-up & purge <input type="checkbox"/> turbine bypass
<i>suitable media</i>	<input type="checkbox"/> air & air constituents <input type="checkbox"/> steam <input type="checkbox"/> natural gas <input type="checkbox"/> technical gases
<i>typical pressure drop</i>	0 bar   0 psi
<i>typical noise reduction</i>	$\geq 25$ dB <i>depending on design and number of absorber stages</i>
<i>design</i>	<p>circular baffle silencer executed in stainless steel and mineral wool with long-stranded glass fabric lining, combined with an optimised radial diffuser inlet</p> <p><i>The gas flow is redirected and evenly distributed by the diffuser pipe, and the noise absorbed by the absorber baffles. Absorbing silencers can easily be extended with additional absorbers to achieve higher noise reduction.</i></p>



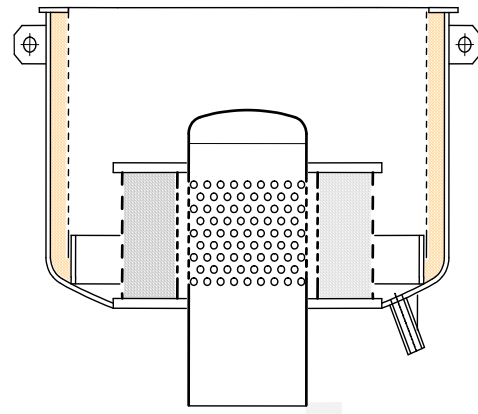
## DIFFUSER SILENCER

<i>type</i>	<b>D</b>
<i>typical applications</i>	<input type="checkbox"/> any vent or blow-down application <input type="checkbox"/> boiler start-up & purge <input type="checkbox"/> turbine bypass
<i>suitable media</i>	<input type="checkbox"/> air & air constituents <input type="checkbox"/> steam <input type="checkbox"/> natural gas <input type="checkbox"/> technical gases
<i>typical pressure drop</i>	> 0.2 bar   > 3 psi
<i>typical noise reduction</i>	up to 50 dB
<i>design</i>	<p>single- or multi-stage small-bore radial diffuser, surrounded by wrapped, finely woven stainless steel wire mesh</p> <p><i>In comparison to standard absorbing silencers, this technology provides comparable to better noise attenuation in a substantially smaller and lighter design.</i></p>



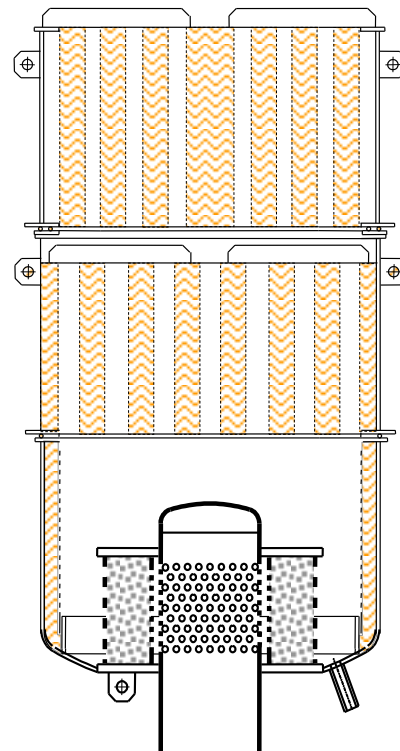
## DIFFUSER SILENCER WITH INSULATED SHELL

<i>type</i>	<b>DA</b>
<i>typical applications</i>	<input type="checkbox"/> any vent or blow-down application <input type="checkbox"/> boiler start-up & purge <input type="checkbox"/> turbine bypass
<i>suitable media</i>	<input type="checkbox"/> air & air constituents <input type="checkbox"/> steam <input type="checkbox"/> natural gas <input type="checkbox"/> technical gases
<i>typical pressure drop</i>	> 0.2 bar   > 3 psi
<i>typical noise reduction</i>	up to 50 dB
<i>design</i>	type <b>D</b> diffuser silencer, equipped with an additional long-stranded glass fabric / mineral wool insulation of the inner shell surfaces  <i>The extra layer provides improved thermal and acoustic insulation of the outer shell.</i>



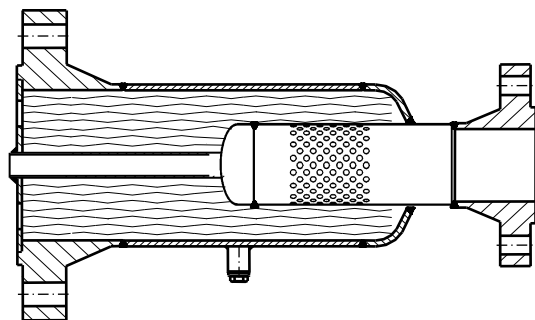
## COMBINED SILENCER DIFFUSER / ABSORBER COMBINATION

<i>type</i>	<b>DAA</b>
<i>typical applications</i>	<input type="checkbox"/> any vent or blow-down application <input type="checkbox"/> boiler start-up & purge <input type="checkbox"/> turbine bypass
<i>suitable media</i>	<input type="checkbox"/> air & air constituents <input type="checkbox"/> steam <input type="checkbox"/> natural gas <input type="checkbox"/> technical gases
<i>typical pressure drop</i>	> 0.2 bar   > 3 psi
<i>typical noise reduction</i>	≥ 50 dB
<i>design</i>	<p>integrated combination of a type <b>DA</b> diffuser silencer with one or several type <b>A</b> absorbing silencers stages</p> <p><i>The combination of a high-performance diffuser silencer with circular baffle absorber stages enables realising silencers for (almost) any noise reduction requirement.</i></p>



## INLINE DIFFUSER SILENCER

<i>type</i>	<b>INLINE</b>
<i>typical applications</i>	<p>closed systems requiring muffled in-line expansion of gaseous fluids under pressure without releasing them into the atmosphere, e.g.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> venting / blowing-down into a pipe or pressure vessel</li> <li><input type="checkbox"/> condenser injection</li> <li><input type="checkbox"/> turbine bypass</li> </ul>
<i>suitable media</i>	<ul style="list-style-type: none"> <li><input type="checkbox"/> air &amp; air constituents</li> <li><input type="checkbox"/> steam</li> <li><input type="checkbox"/> natural gas</li> <li><input type="checkbox"/> technical gases</li> </ul>
<i>typical pressure drop</i>	> 0.2 bar   > 3 psi
<i>typical noise reduction</i>	up to 50 dB
<i>design</i>	<p>specialised silencer for noise control in closed systems, based on a suitably modified type <b>D</b> diffuser silencer</p> <p><i>The fluid is expanded through a multitude of small diffuser bores into a finely woven stainless steel wire mesh.</i></p>





## DUMP TUBE / DIFFUSER PIPE

*type*

**DIFFUSER**

*typical applications*

- gas expansion into low-pressure environments
- condenser injection
- turbine bypass
- controlled redirection and distribution of gas flows
- pressure control
- temperature control

*suitable media*

- air & air constituents
- steam
- natural gas
- technical gases

*typical pressure drop*

> 0.2 bar | > 3 psi

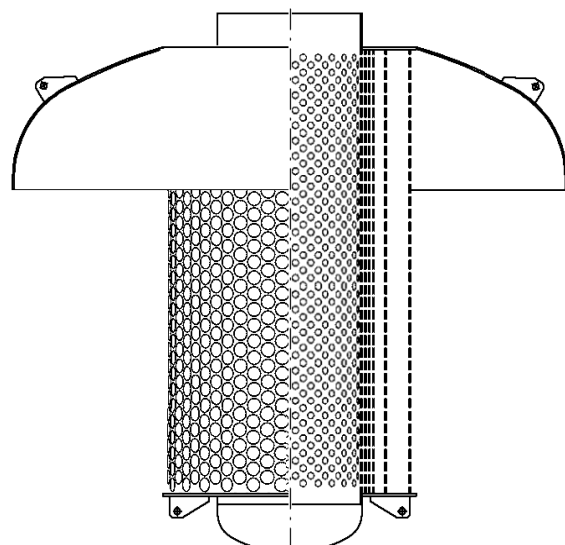
*typical noise reduction*

up to 35 dB

*design*

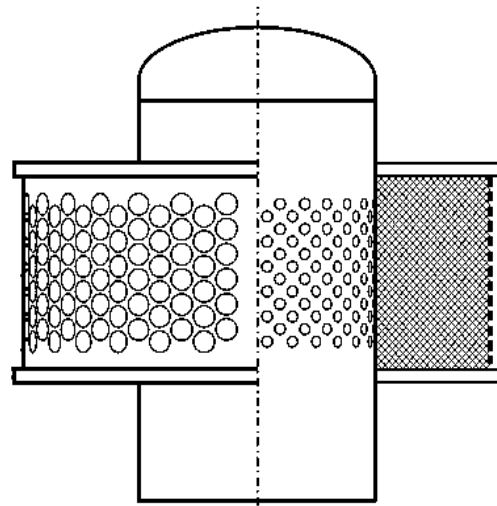
multi-stage dump tube expander with application-specifically optimised number, size and arrangement of diffuser stages and diffuser holes, made from carbon steel or stainless steel

*available in customised designs engineered by GLAUNACH, or according to customer specifications*



## DIFFUSER

<i>type</i>	<b>DIFFUSER</b>
<i>typical applications</i>	<p>dump tube-applications requiring better noise attenuation, in particular</p> <ul style="list-style-type: none"><li><input type="checkbox"/> gas expansion into atmospheric- / high-pressure environments</li><li><input type="checkbox"/> condenser injection</li><li><input type="checkbox"/> turbine bypass</li><li><input type="checkbox"/> controlled redirection and distribution of gas flows</li><li><input type="checkbox"/> pressure control</li><li><input type="checkbox"/> temperature control</li></ul>
<i>suitable media</i>	<ul style="list-style-type: none"><li><input type="checkbox"/> air &amp; air constituents</li><li><input type="checkbox"/> steam</li><li><input type="checkbox"/> natural gas</li><li><input type="checkbox"/> technical gases</li></ul>
<i>typical pressure drop</i>	> 0.2 bar   > 3 psi
<i>typical noise reduction</i>	up to 50 dB
<i>design</i>	multi-stage small-bore radial diffuser, surrounded by a pack of finely woven stainless steel wire mesh





## FISH MOUTH

*type*

**DIFFUSER**

*typical applications*

dump tube-applications requiring noise attenuation in confined space

- gas expansion into atmospheric- / high-pressure environments
- condenser injection
- turbine bypass
- controlled redirection and distribution of gas flows
- pressure control
- temperature control

*suitable media*

- air & air constituents
- steam
- natural gas
- technical gases

*typical pressure drop*

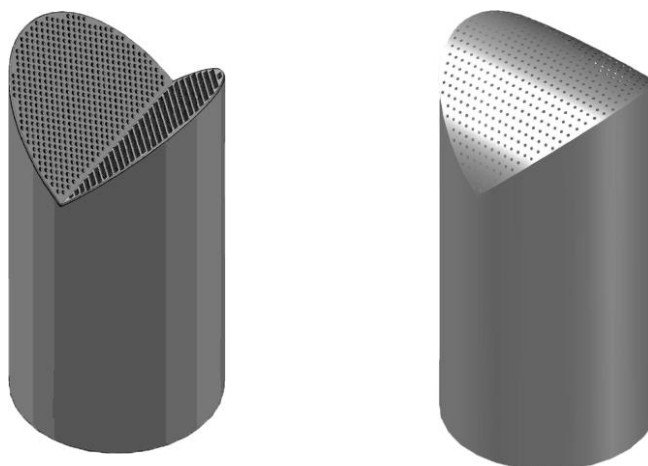
> 0.2 bar | > 3 psi

*typical noise reduction*

up to 15 dB

*Design*

one or two stage small-bore axial diffuser



## MICRO SILENCER

<i>type</i>	<b>DIFFUSER</b>
<i>typical applications</i>	<ul style="list-style-type: none"><li><input type="checkbox"/> small inlets from 1.25" to 6"</li><li><input type="checkbox"/> vent application for capacities &lt; 10 t/h   22000 lb/h</li><li><input type="checkbox"/> anti-icing</li><li><input type="checkbox"/> cryo-gas</li><li><input type="checkbox"/> vapor line</li><li><input type="checkbox"/> controlled redirection and distribution of gas flows</li><li><input type="checkbox"/> pressure control</li><li><input type="checkbox"/> temperature control</li><li><input type="checkbox"/> flame arrester</li></ul>
<i>suitable media</i>	<ul style="list-style-type: none"><li><input type="checkbox"/> pure process gases without liquid or solid components</li><li><input type="checkbox"/> air</li><li><input type="checkbox"/> steam</li><li><input type="checkbox"/> natural gas</li><li><input type="checkbox"/> hydrogen</li><li><input type="checkbox"/> etc.</li></ul>
<i>typical pressure drop</i>	> 0.2 bar   > 3 psi
<i>typical noise reduction</i>	up to 15 dB
<i>Design</i>	one or multi-stage small-bore axial diffuser, surrounded by a pack of finely woven stainless steel wire mesh



## INLINE MICRO ABSORBER SILENCER

<i>type</i>	<b>INLINE</b>
<i>typical applications</i>	closed systems requiring muffled in-line section of pressure free gases without releasing them into the atmosphere, e.g. <ul style="list-style-type: none"> <li><input type="checkbox"/> venting / blowing-down into a pipe or pressure vessel</li> <li><input type="checkbox"/> electrolysis plants</li> </ul>
<i>suitable media</i>	<ul style="list-style-type: none"> <li><input type="checkbox"/> pure process gases without liquid or solid components</li> <li><input type="checkbox"/> air</li> <li><input type="checkbox"/> steam</li> <li><input type="checkbox"/> natural gas</li> <li><input type="checkbox"/> hydrogen</li> <li><input type="checkbox"/> etc.</li> </ul>
<i>typical pressure drop</i>	0 bar   0 psi
<i>typical noise reduction</i>	≥ 15 dB
<i>design</i>	For optimal noise reduction, the gas flows through a baffle section made of sound-absorbing stainless-steel mesh

