Safety silencers

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Patented safety silencers with warning indicators

Many researchers and experts consider noise to be one of the biggest environmental problems we face today. Alarming reports show that an increasing number of people are being injured by noise. This has resulted in stricter laws and regulations in recent years. Unfortunately however, many are still unaware of the risks exposure to noise entails.

People often think that noise is a natural part of the manufacturing industry and that it is something you get used to. But in truth you don't get used to noise – noise injures, and the damage is permanent.

Using silencers

The noise generated by pneumatic valves is far more dangerous than is generally believed. In fact, 70-80% of all hearing impairment within the manufacturing industry is caused by compressed air noise. However, to a great extent this noise is totally unnecessary; for with the right technology, compressed air noise can, in practice, be eliminated entirely. Fitting the exhaust ports of pneumatic valves with silencers is a simple measure to take, and the advantages are many and well-documented:

- **Reduced risk of hearing problems such as tinnitus, hearing loss, echoing and hypersensitivity to sound**
- **Better working environment**
- **Improved performance**

Two-chamber system

Decreases backpressure when the expansion volume increases and new filter surface is exposed.

Warning indicator

Provides early warning before problems arise in the pneumatic system.

Inner diffuser

Extends from the outer silencer chamber when backpressure is too great.

Outer diffuser

Effectively muffles noise through optimal use of the material volume.

Clogging

A well-known problem with conventional silencers is that, sooner or later, the filter - the diffuser - becomes clogged with impurities and causes:

- **Costly machine stoppage**
- **Operational disturbance that is difficult to pinpoint**
- **Risk of explosion**

This has resulted in many production technicians removing silencers to avoid problems of this sort. Quite simply, the advantages of noise abatement have had to take a back seat to the practical problem of clogging.

Warning indicators offer a solution

Years of research have enabled Silvent to develop a new, unique and patented series of safety silencers with built-in warning indicators. Basically, the design allows the silencer itself to determine and set the optimal combination of flow capacity and noise reduction through the use of a dynamic inner diffuser. A reliable warning system also indicates that the silencer is about to clog. Using safety silencers of this type means that you:

- **Minimize costly machine stoppage**
- **Receive a warning before problems arise**
- **Reduce the risk of industrial accidents**
- **Allow prioritization of noise control measures**

Overview of our products

Safety silencers

Silvent offers a selection of silencers that increases safety in all types of compressed air installations. The range is primarily designed for stationary installations of pneumatic cylinders and valves. The risk of operational disturbance as a result of clogged filters is a large and costly problem with conventional silencers. Choosing Silvent safety silencers can eliminate such problems entirely.

There are standard silencers with connections from 1/8" up to 2".

All the safety silencers in the range can be connected to individual valves. The larger models can also serve as central silencers and be connected to a large number of valves. Installations with central silencers normally require less maintenance, and therefore mean savings of both time and money.

Silencers for continuous flow applications and silencers that separate oil from the compressed air system are also included in the range.

Silvent's application engineers will gladly offer tips and advice on which silencers are most suitable for different purposes.

Be sure to read about the importance of correct dimensioning when choosing a safety silencer on pages 128-129.

1/8"- 1/2"

Silvent's new series of safety silencers offers extremely effective silencing, compact size and a unique and patented warning system.

SIS-02 New!
See page 130

SIS-03 New!
See page 130

SIS-04 New!
See page 131

SIS-05 New!
See page 131

1"- 2"

Silvent's larger safety silencers also feature warning indicators and are designed for systems with large flow volumes that require minimal flow restriction and low backpressure.

SIS-10
See page 132

New!

SIS-20
See page 133

New!

Special products

Silvent's hose silencers, central silencers and expansion silencers are often used in tailor-made solutions for special applications.

SDR 18
See page 134

SDR 14
See page 134

CD
See page 135

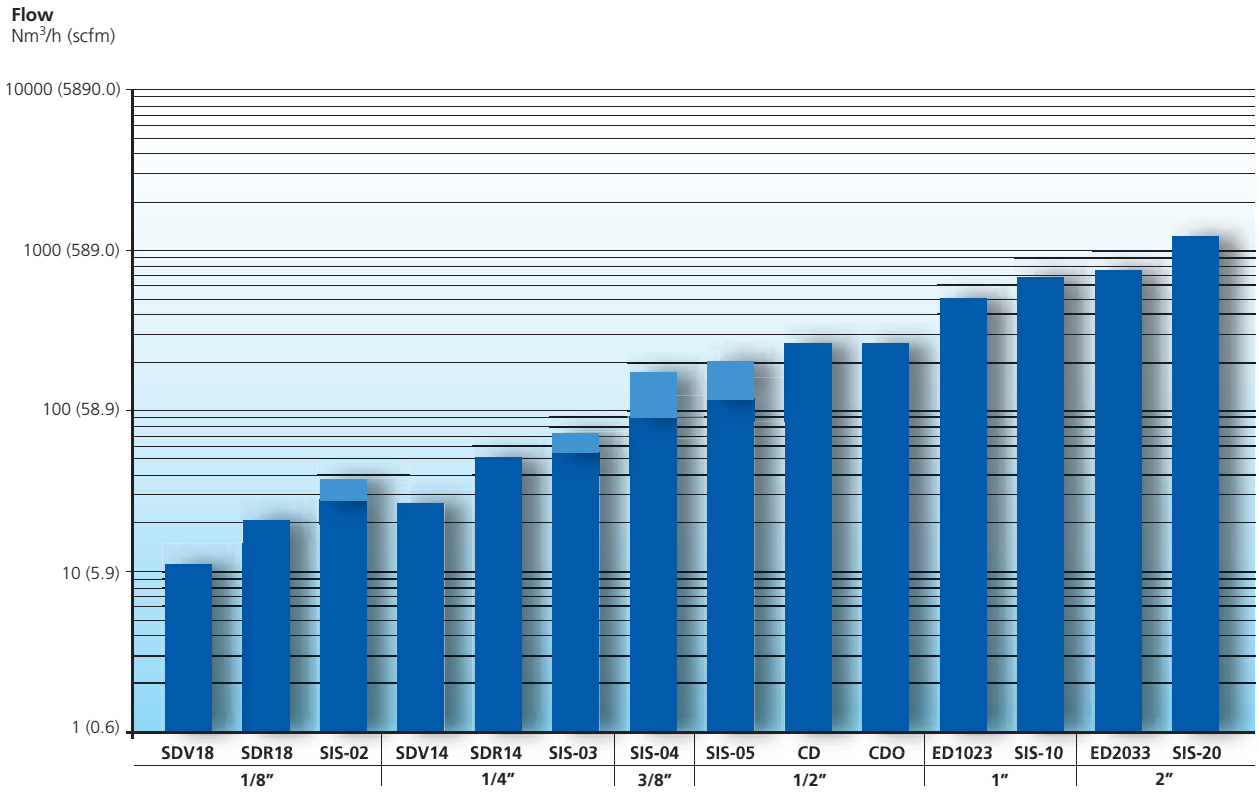
ED 1023
See page 135

ED 2033
See page 135

Dimensioning guidelines

When dimensioning compressed air systems, the exhaust time is strongly affected by the volume and pressure of the contained air. Therefore, it is important to consider the silencer's flow capacity carefully to avoid unnecessary backpressure in the system. If an application is especially sensitive to backpressure, select a silencer with extra large flow capacity. The diagram below shows the recommended maximum flow through the various silencers in the Silvent range.

Flow through a regulating valve at an operating pressure of 500 kPa (71.5 psi)



*The upper value is the max. recommended flow when the indicator is visible.

Explanation of symbols

Flow

The flow the silencer will allow to pass at an operating pressure of 500 kPa (71.5 psi). Applies before a valve with intermittent operation.

Warning indicator

The symbol is used for all the valves that give an indication of clogging.

Connection thread

Shows the size of the silencer's connection. All our silencers are available with both BSP and NPT threads.

Noise reduction

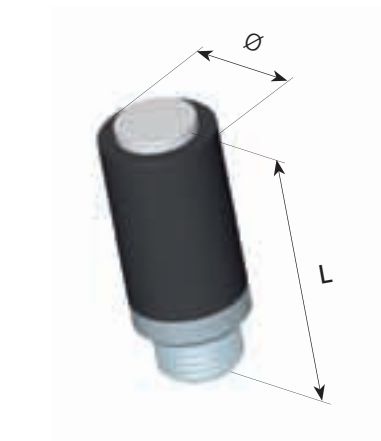
Specifies how many decibels the silencer lowers the sound level in comparison with an unsilenced valve at an operating pressure of 500 kPa (71.5 psi).

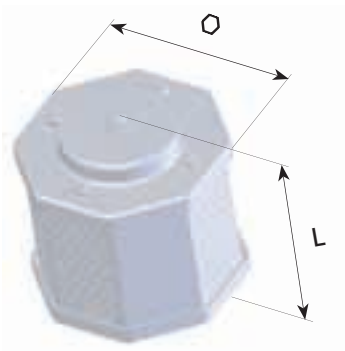
A sound level reduction of 8 to 10 dB(A) is experienced by the human ear as if the sound level has been cut in half. Read more about sound and noise on fact pages 140-148 or visit our website at www.impactrm.com.

Dimensions

All values are expressed in mm unless otherwise stipulated.

Complete information on all our silencers is available at www.impactrm.com.





Silvent 1/8" - 1/2"

Silvent's new series of safety silencers offers extremely effective noise reduction, compact size and a unique and patented warning system. The silencer's warning indicator gives early warning that backpressure in the system is too high. Maintenance personnel can both see and hear (by an elevated sound level) that it is time to replace the silencer before costly and unnecessary operation disturbance occurs. Since the warning indicator extends when it is pressed out, it is also possible to use electronic monitoring to stop the machine for silencer replacement. These safety silencers provide noise reduction of 30-35 dB(A). Silvent offers four different dimensions. Patented.

Order no: **SIS-02**

Air flow	27 Nm³/h	(15.9 scfm)
Sound level	65.5 dB(A)	
Connection	1/8" BSP	1/8"-27 NPT
Dimensions	Ø14x36	(Ø0.55x1.42")
Material	PP	

27 Nm³/h
15.9 scfm

i

1/8"

Noise reduction 32dB(A)

** Compared with an unsilenced valve.*

For more technical information, see page 152 or visit our website at www.impactrm.com.

Order no: **SIS-03**

Air flow	53 Nm³/h	(31.2 scfm)
Sound level	66.5 dB(A)	
Connection	1/4" BSP	1/4"-18 NPT
Dimensions	Ø18x43	(Ø0.71x1.69")
Material	PP	

53 Nm³/h
31.2 scfm

i

1/4"

Noise reduction 33dB(A)

** Compared with an unsilenced valve.*

For more technical information, see page 152 or visit our website at www.impactrm.com.

Order no: **SIS-04**

Air flow	89 Nm³/h	(52.4 scfm)
Sound level	73.2 dB(A)	
Connection	3/8" BSP	3/8"-18 NPT
Dimensions	Ø25x56	(Ø0.98x2.20")
Material	PP	

89 Nm³/h
52.4 scfm

i

3/8"

Noise reduction **30**dB(A)

* Compared with an unsilenced valve.

For more technical information, see page 152 or visit our website at www.impactrm.com.

Order no: **SIS-05**

Air flow	115 Nm³/h	(67.7 scfm)
Sound level	76.5 dB(A)	
Connection	1/2" BSP	1/2"-14 NPT
Dimensions	Ø30x73	(Ø1.18x2.87")
Material	PP	

115 Nm³/h
67.7 scfm

i

1/2"

Noise reduction **33**dB(A)

* Compared with an unsilenced valve.

For more technical information, see page 152 or visit our website at www.impactrm.com.

For a flow diagram for safety silencer, see pages 162-163.

Working principle of the warning indicator

The design is based on a two-chamber system with an inner and an outer silencing chamber. The inner diffuser serves as a warning indicator that is pressed out when backpressure is too high. In certain systems, the warning indicator may be partially extended after initial use. This is normal - the silencer then provides optimal flow and correct backpressure. It is time to replace the silencer when the inner diffuser extends far enough to show the red marking on the warning indicator.

Silvent 1" - 2"

Silvent's safety silencers are designed to handle sensitive systems with large flows that require minimal flow restriction. The silencers are compact in size, provide extremely effective noise suppression and feature a built-in warning indicator that immediately shows any increase of backpressure in the system. The unique filter material is divided into numerous "noise traps" or cells and gives extremely good muffling with minimal flow restriction. These safety silencers are also suitable for continuous flow applications and use as a central silencer for several pneumatic valves. They have a built-in oil trap where oil can be separated and drained. The silencers are available in two sizes, 1 inch and 2 inch, and reduce noise levels 40-45 dB(A). They are supplied with a mounting bracket.

Order no: **SIS-10**

Air flow	670 Nm³/h	(394.3 scfm)
Sound level	81.6 dB(A)	
Connection	1" BSP	1"-11 1/2 NPT
Dimensions	Ø140 x 130	(Ø5.51 x 5.12")
Material	Steel, PP	

670 Nm³/h
394.3 scfm

i

1"

For more technical information, see page 152 or visit our website at www.impactrm.com.

Noise reduction 42dB(A)

** Compared with an unsilenced valve.*

Noise reduction **41**dB(A)

* Compared with an unsilenced valve.

Order no: **SIS-20**

Air flow	1210 Nm³/h	(712.2 scfm)
Sound level	94.3 dB(A)	
Connection	2" BSP	2"-11 1/2 NPT
Dimensions	Ø140 x 230	(Ø5.51 x 9.06")
Material	Steel, PP	

1210 Nm³/h
712.2 scfm

i

2"

For more technical information, see page 152 or visit our website at www.impactrm.com.

For a flow diagram for safety silencer, see pages 162-163.

Working principle of silencers with warning indicators

The unique ability these silencers possess, combining high noise suppression with low pressure drop, is accomplished by silencing in three steps.

1. The inherent turbulence of the air entering the silencer is reduced by a fine-meshed grid.

2. The air then continues into a diffusion chamber. The diffuser raises the frequency of the sound and distributes the air stream evenly across the octagonal outer filter. A higher frequency accelerates silencing.

3. The final silencing step takes place in the cell structure of the octagonal filter. Here the velocity of the air is successively reduced, thereby radically lowering the sound level without creating excessive pressure drop.

Oil drainage
Another advantage of the octagonal filter's cell structure is that possible oil mist in the compressed air system is separated. When air velocity decreases, droplets form. These can then be drained off through the bottom of the silencer.

Warning indicator
The silencer's warning indicator is set for installation after a regulating valve. When the pressure differential across the silencing filter becomes too great, the red warning indicator pops out, signaling that it is time to change filters. If the silencer is used in a continuous flow application without a regulating valve, the red warning indicator may be visible after initial use. The service interval in continuous flow applications must therefore be determined by monitoring the system.

Silvent Special

Hose silencer SDR features a unique design that provides effective noise suppression and will not allow the silencer to clog. Impurities can pass unhindered between the wall of the hose and the built-in absorber, eliminating the risk of explosion and disrupted service.

Central silencer CD is intended for silencing exhaust air from large individual valves or as a shared silencer for several smaller valves. The silencer is dimensioned to handle the flow from a 1/2 inch valve or a number of 1/4 inch valves. This silencer is also available with a built-in oil trap for highly effective oil separation.

Expansion silencer ED is designed to handle the flow from cylinders with large stroke volumes or in compressed air systems with short cycles that require rapid pressure reduction. These silencers are dimensioned for valves of up to 2 inches and short cycles.

All the safety silencers on this page are intended for a maximum exhaust air pressure of 200 kPa (30 psi).

Order no: **SDR18**

Air flow	20.4 Nm³/h	(12.0 scfm)
Sound level	72.5 dB(A)	
Connection	1/8" BSP	
Dimensions	Ø13x266	(Ø0.51x10.47")
Material	PVC, PP	

20.4 Nm³/h
12.0 scfm
1/8"

Noise reduction **25**dB(A)

** Compared with an unsilenced valve.*

Also available with 90° angle connection. Order no.: SDV18.
For more technical information, see page 152 or visit our website at www.impactrm.com.

Order no: **SDR14**

Air flow	50.9 Nm³/h	(30.0 scfm)
Sound level	75 dB(A)	
Connection	1/4" BSP	
Dimensions	Ø17x338	(Ø0.67x13.31")
Material	PVC, PP	

50.9 Nm³/h
30.0 scfm
1/4"

Noise reduction **25**dB(A)

** Compared with an unsilenced valve.*

Also available with 90° angle connection. Order no.: SDV14 .
For more technical information, see page 152 or visit our website at www.impactrm.com.

Noise reduction **34**dB(A)

* Compared with an unsilenced valve.

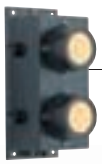
Order no: **CD**

Air flow	261 Nm³/h	(153.6 scfm)
Sound level	76 dB(A)	
Connection	Ø20/16	
Dimensions	Ø150x110	(Ø5.91x4.33")
Material	PP	

261 Nm³/h **153.6** scfm

Ø20/16

Also available with a built-in oil trap for highly effective oil separation. Order no. : CDO
For more technical information, see page 152 or visit our website at www.impactrm.com.



Noise reduction **29**dB(A)

* Compared with an unsilenced valve.

Order no: **ED 1023**

Air flow	490 Nm³/h	(288.4 scfm)
Sound level	92.4 dB(A)	
Connection	1" BSP	1"-11 1/2 NPT
Dimensions	175x205x410	(6.89x8.07x16.14")
Material	Steel, PP	

490 Nm³/h **288.4** scfm

1"

For more technical information, see page 152 or visit our website at www.impactrm.com.

Noise reduction **31**dB(A)

* Compared with an unsilenced valve.

Order no: **ED 2033**

Air flow	740 Nm³/h	(435.5 scfm)
Sound level	106.5 dB(A)	
Connection	2" BSP	2"-11 1/2 NPT
Dimensions	175x245x610	(6.89x9.65x24.00")
Material	Steel, PP	

740 Nm³/h **435.5** scfm

2"

For more technical information, see page 152 or visit our website at www.impactrm.com.

Accessories

Order no: **UK**

Collection vessel for oil. For use together with CDO.

Order no: **ARG 12**

Connection pipe with 1/2" female thread. For CD and CDO.

Order no: **FA**

Outer filter. For CD and ED.

Order no: **FC**

Diffuser filter. For CD and ED.

Applications

Silvent SIS-02
Silvent SIS-02s are used here to muffle exhaust air noise in a butt welding machine and warn operators if backpressure in the system should rise.

Silvent SIS-03
Here Silvent SIS-03s silencers feed equipment for granules in the plastics industry.

Silvent SIS-04
A heat stamping machine has been fitted with a Silvent SIS-04, whose low backpressure improved the quality of marking.

www.impactrm.com

You will find more examples and further information on how Silvent's products are used in the application database on our website.

Silvent SIS-10
Here, a Silvent SIS-10 dampens the sound at a test bench in a laboratory. A number of regulating valves are connected to the same safety silencer to attain the lowest possible sound level in an otherwise quiet environment.

Silvent CD
A Silvent CD installed on an automatic edge cutter for the sawmill industry to get rid of noise and reduce maintenance work due to clogged silencers.

Silvent ED 2033
By connecting two Silvent ED 2033s in series, problems with both noise and excessive back-pressure have been eliminated at this powder press.