Serpent ventilation

A complete ventilation system for successful tunneling and mining operations, including system design, fan station, ducting and installation

Epiroc

Control the air. Control your business.

The Serpent ventilation system controls air flow with unrivalled efficiency to provide adequate ventilation where and when you need it most. Reliable high-pressure fans and durable PVC-coated ducts contribute to optimal air flow day in and day out. The smart, efficient Serpent ventilation system can cut your energy costs by up to 50%.

Main benefits

High efficiency with minimal air waste between impaler tip and housing

Durable design thanks to high thickness of material in fans housing and low noise because of special design silencer

A singel supplier with years of experience and high knowhow to meet all your needs

For optimal energy-saving performance, fans can be fitted with a frequency-control switch

Serpent fans are available in nine different sizes and several system combinations to perfectly suit your unique operational conditions and requirements

Fans with robust, fully-welded steel casings and blades that are statically and dynamically balanced

Fans are built to cope with the stresses of continuous operation, day after day, year after year

To maintain extra-high pressure, up to five units of any diameter and motor size can be connected in series at a single fan station

With fans that move more air per unit of energy, the Serpent is more economical than other, more simple systems

Serpent fans are available with standard or super silencers to eliminate high-frequency sounds and reduce noise levels to a minimum

A complete ventilation system

With its custom design, the Serpent system features flexible ducting, sound absorbers, and efficient high-pressure fans managed by an energy-saving control system. Serpent ventilation systems that have proven their excellence in hundreds of installations with more than a thousand different fans, duct lengths and duct sizes are available to comprise.

+ Optimal design

We use reliable computational methods to optimize your system. To reduce operational costs, the impeccable system design ensures that pressure loss is kept to a minimum at all times. An accurate installation and the ability to easily maintain your ventilation system can considerably lower your long-term expenditures.

+ Flexible ducting

Serpent system ducting can be highly customized. The heavy-duty, PVC-coated ducts can be delivered in a variety of lengths and diameters to fit your pressure needs. Ducting materials – lightweight, yet durable. Two types of airtight connectors – zip-joints and steel rings – ensure minimal air loss throughout the system.

+ One supplier with global presence

We design, manufacture and test all components of the Serpent ventilation system to certify their quality. Through years of experience, we have developed the know how to craft custom systems tailored to your distinctive requirements. We also provide you with a single contact to turn to with all your support and system extension needs.

A comprehensive service offering

Even the best equipment needs to be serviced regularly to make sure it sustains peak performance. An Epiroc service solution offers peace of mind, maximizing availability and performance throughout the lifetime of your equipment. We focus on safety, productivity and reliability.

By combining genuine parts and an Epiroc service from our certified technicians, we safeguard your productivity – wherever you are.

The Serpent has the power to reduce your energy consumption

Few people think about ventilation as they go about their daily lives. We take for granted that our offices, stores and cinemas are well ventilated. Below ground, however, the story changes.

Here, ventilation is critical and can never be taken for granted. Without proper ventilation, excavation work of any kind is simply impossible. Ventilation systems used in tunneling and mining face a range of complex challenges. Poor ventilation lowers productivity and raises energy costs.

Ventilation needs vary during the work cycle depending on the type of operation being performed. Drilling normally requires only 30–40% of total ventilation capacity, while mucking and haulage require a significantly greater capacity. In general, maximum ventilation capacity is required only after blasting and during intensive haulage.

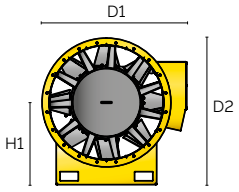
In most older ventilation systems, capacity cannot be adjusted. They simply run at 100% capacity all the time, driving more fresh air into the mine than necessary and extracting air when there are no gases or fumes to remove.

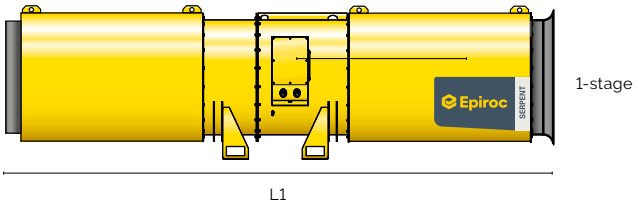
They also normally leak substantial amounts of air, thereby reducing pressure, increasing energy consumption, and driving up total operational costs. Since ventilation is a major long-term cost in tunnel and mine excavation – often accounting for some 35–45% of total energy consumption – ventilation is an area that represents huge potential gains.

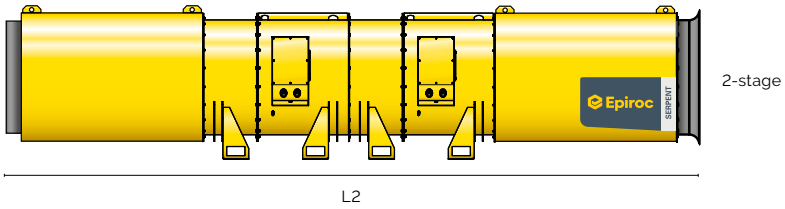
To save energy and considerable sums of money, the Serpent ventilation system has the power to give you the exact rate of air flow you need to suit the operation at hand. For example, you can increase air flow to rapidly evacuate fumes after blasting and then quickly revert to normal operational mode. You can save as much as 50% by relying on the Serpent instead of on traditional single-speed ventilation systems.

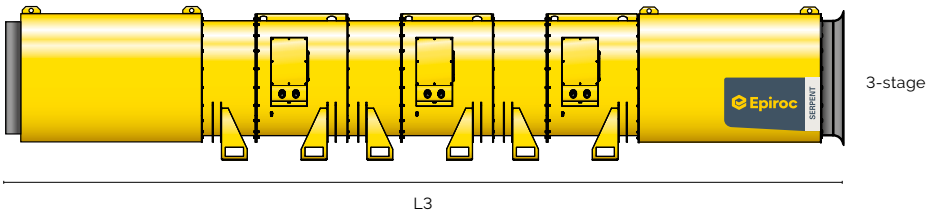
Technical specifications

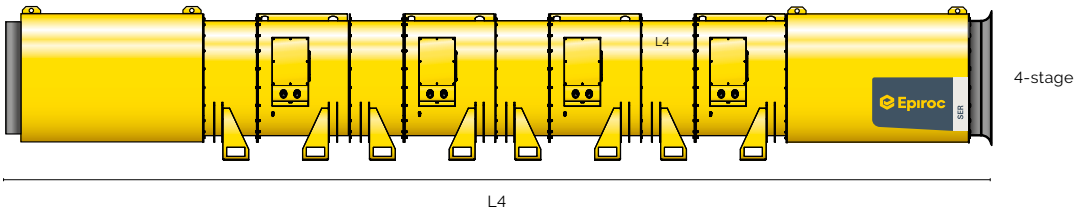
● = Standard ○ = Option











Fan station

1 Stage	●
2 Stage	○
3 Stage	○
4 Stage*	○

*More stages can be offered as special request

Silencer

Standard silencer	●
Super silencer	○
Extra super silencer	○

Starting system

Frequency inverter	○
Soft starter	○
Start delta (Y/D) starter	○

Control system

Remote box	○
Stop set	○
Vibration monitor	○
Wireless control tool	○
Flow and pressure display	○

Cable set

EMC approved cable set	○
Non-EMC approved cable set	○

Add on options

Louvre damper	○
Roof hanging kit	○
Mounting frame	○
Protective container cover	○

Technical specifications

Main components

Fan station
Silencers
Flexible ducting

Accessories

Installation accessories
Foot
Starters

Dimensions

	AVH63	AVH71	AVH80	AVH90	AVM 90	AVH100	AVM 112	AVH125	AVH140	AVH160	AVH180	AVH224
L1 Length (mm/Inch)	3 398/133.8	3 504/138.0	4 686/184.5	4 084/160.8	4 084/160.8	4 189/164.9	4 926/193.9	6 000/236.2	6 000/236.2	7 200/283.5	7 303/287.5	8 470/333.5
L2 Length (mm/Inch)	4 448/175.1	4 704/185.2	5 588/220	5 464/215.1	5 464/215.1	5 574/219.4	6 426/253.0	7 600/299.2	7 600/299.2	9 000/354.3	9 203/362.3	10 570/416.1
L3 Length (mm/Inch)	5 498/216.5	5 904/232.4	6 490/255.5	6 844/269.4	6 844/269.4	6 959/274.0	7 926/312.0	9 200/362.2	9 200/362.2	10 800/425.2	11 103/437.1	12 670/498.8
L4 Length (mm/Inch)	6 548/257.8	7 104/279.7	7 392/291	8 224/323.8	8 224/323.8	8 344/328.5	9 426/371.1	10 800/425.2	10 800/425.2	12 600/496.1	13 003/511.9	14 770/581.5
Inner diameter (mm/Inch)	630/24.8	710/28	800/31.4	900/35.4	900/35.4	1 000/39.4	1 120/44.1	1 250/49.2	1 400/55.1	1 600/63	1 800/70.9	2 240/88.2
D1 Diameter (mm/Inch)	871/34.3	955/37.6	1 035/40.7	1 172/46.1	1 172/46.1	1 275/50.2	1 420/55.9	1 543/60.7	1 728/68.0	1 941/76.4	2 144/84.4	2 595/102.2
D2 Diameter (mm/Inch)	904/35.6	980/38.6	1 140/44.8	1 155/45.5	1 155/45.5	1 255/49.4	800/31.5	1 578/62.1	1 815/71.5	1 985/78.1	2 229/87.8	2 590/102.0
H1 Height, from bottom to fan center point (mm/Inch)	440/17.3	470/18.5	709/27.9	551/21.7	551/21.7	581/22.9	1 438/56.6	794/31.3	956/37.6	1 026/40.4	1 170/46.1	1 315/51.8
Weight, fan unit (depending on motor) (kg)	approx. 360	approx. 500	approx. 800	approx. 1 000	approx. 1 000	approx. 1 250	approx 1 400	approx. 1 500	approx. 1 460	approx. 2 100	approx. 3 550	approx. 5 800

Technical data

	AVM 90**	AVM 112**	AVH63	AVH71	AVH80**	AVH90	AVH100	AVH125	AVH140	AVH160	AVH180	AVH224
Approximate flow rate (m^3/s)	8-22	13-32	3-9	4-13	6-20	8-22	10-24	14-42	20-48	22-70	40-120	<200
Approximate flow rate (ft^3/min)	16 951-46 615	27 545-67 804	6 357-19 071	8 476-27 547	12 713-42 377	16 952-46 618	21 190-50 856	29 666-88 998	42 380-101 712	46 618-148 330	84 760-254 280	<423 800
1-stage (kPa/Inch H2O)*	.43-4.1	.2-1.01	1.3-2.2/ 5.2-8.8	1.3-2.3/ 5.2-9.2	1.3-2.0	3.5-4.3/ 14.0-17.3	3.8-4.4/ 15.3-17.7	1.5-2.6/ 6.0-10.4	1.2-2.2/ 4.8-8.8	1.3-2.2/ 5.2-8.8	1.5-3.5/ 6.0-14.1	1.0-2.0/ 4.0-8.0
2-stage (kPa/Inch H2O)*	-	-	2.5-4.5/ 10.0-18.1	2.6-4.6/ 10.4-18.5	-	7.0-8.6/ 28.1-34.5	7.3-8.7/ 29.3-34.9	2.9-5.1/ 11.6-20.5	2.3-4.3/ 9.2-17.3	2.5-4.3/ 10.0-17.3	3.0-7.0/ 12.0-28.1	1.5-4.0/ 6.0-16.1
3-stage (kPa/Inch H2O)*	-	-	4.0-6.5/ 16.1-26.1	4.1-6.6/ 16.5-26.5	-	10.1-12.5/ 40.5-50.2	10.3-12.6/ 41.4-50.6	4.5-7.7/ 18.1-30.9	3.5-6.4/ 14.1-25.7	3.8-6.4/ 15.3-25.7	5.0-10.3/ 20.1-41.4	2.0-5.7/ 8.0-22.9
4-stage (kPa/Inch H2O)*	-	-	5.0-7.5/ 20.1-30.1	5.2-8.5/ 20.9-34.1	-	12.8-16.0/ 51.4-64.2	12.9-16.2/ 51.8-65.0	6.0-9.5/ 24.1-38.1	4.6-9.5/ 18.5-38.1	5.1-8.5/ 20.5-34.1	-	-
Nominal power (50HZ) (kW)	30-37	5.5-30	5.5-30	7.5-37	30-55	37-110	37-110	37-110	37-132	37-200	132-500	110-400
Impeller blades (pcs)	8	8	8	8	8	8	8	8	8	10	10	10/12

*The numbers for the fans are specified for 50 Hz but the fans are also available up to 60 Hz
** Theoretical data

Flexible ducting

	AIROLITE S (Steel ring)	AIROLITE S (Zipper function)	TITAN S (Steel ring)	TITAN S (Zipper function)
Diameter (mm)	300-1 800	500-3 000	300-1 800	500-3 000
Section length (m)	10-200	10 -200	10-200	10-200
Bend	–	–	30°/45°/60°/90°	30°/45°/60°/90°
Branch	–	–	30°/45°/60°	30°/45°/60°
T–Branch	–	–	Yes	Yes
Y–Branch	–	–	90°	90°
Duct cone, duct diameter range (mm)	–	–	400-1 800	600-3 000
Duct adapter, duct diameter range (mm)	–	–	500-1 800	500-3 000
Repair sleeve, length (m)	–	–	–	1.0/3.0/5.0
Weight (g/m^2)	500	500	600	600

United in performance. Inspired by innovation.

Performance unites us, innovation inspires us, and commitment drives us to keep moving forward. Count on Epiroc to deliver the solutions you need to succeed today and the technology to lead tomorrow.

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