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Howden
A Chart Industries Company

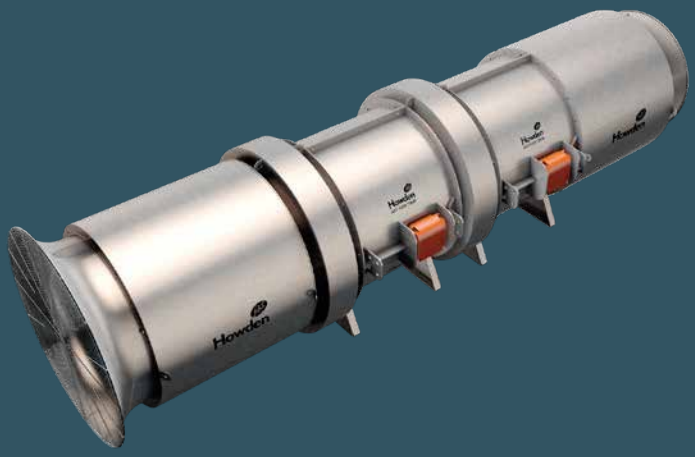
Jetstream AX

Flexible design and high performance
fans for mining and tunneling operations

A flexible and modular design approach while achieving high-efficiency performance across the fan curve.

For more than a century, Howden has supplied ventilation equipment to every major mining company in the world, from frozen sites in the Arctic and the hottest nations in Africa to some of the deepest mines on the planet.

Drawing on Howden's extensive mining and tunneling experience, the Jetstream AX range of fans have been specifically developed to meet the requirements of auxiliary fan applications in demanding environments with a particular focus on performance, durability and flexibility. Our vast experience in mine and tunnel ventilation applications and our global footprint positions Howden to optimally serve the mining and tunneling markets.



TMVS integration

The Jetstream AX fan range aligns with Howden's Total Mine Ventilation Solutions (TMVS) offerings by complimenting our product suite for mine ventilation applications.

TMVS is a fully customizable, integrated suite of expertize, products and services. Providing efficiency and safety across operations globally.

By reducing blast clearing downtime, Howden can improve production rates by up to 70%

Combining world-class expertize and the latest technology, Jetstream AX and Ventsim CONTROL brings together impressive production efficiencies in your mine operation.

Ventsim CONTROL is fully integrated with the Ventsim DESIGN model. It utilizes intelligent software connected to hardware devices to monitor remotely, control, and automate airflow, heating, and cooling. In that way, it delivers safer, more productive, and lower-cost ventilation for your mine.

Increase production

Clear blast gases faster, decreasing downtime up to 3 hours per production blast.

Health and safety operation

No personnel are required to control fans manually. Automatically increase airflow to active levels.

Energy savings

Strategic deployment of variable frequency drives reduces power usage by more than 50-60%.

For more information on how Ventsim CONTROL software works and it's benefits, **click here to watch our video.**

Jetstream AX

The Jetstream AX not only improves personnel working conditions underground but also expands available working places with improved airflow management.

Howden's Jetstream AX auxiliary mine ventilation fans are designed to give the highest fan output at low power consumption, providing high efficiencies across a broad operating range. Efficiencies of over 85% are achievable.

The range of fans varies from 762mm to 1600mm in diameter and are available in either single-stage or twin stage configurations. The range of sizes aligns with standard ventilation duct sizes employed in underground mines around the world.

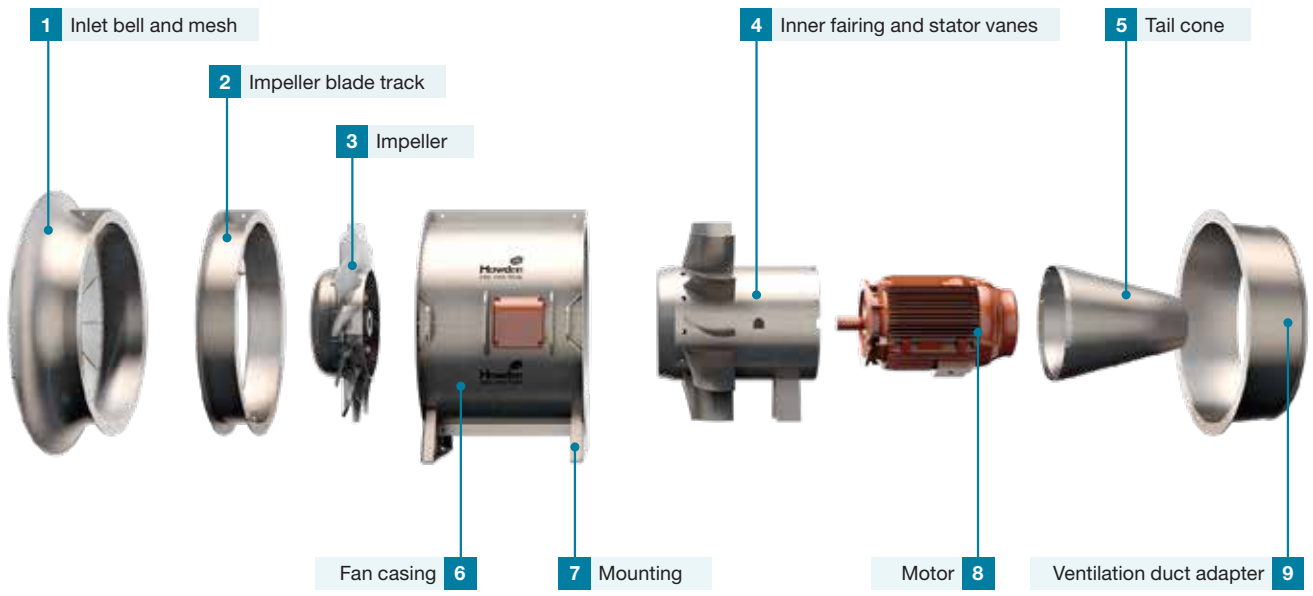
Nonstandard fan sizes are available on request. Numerous duty combinations are available, with the ability for multi-stage configurations to achieve higher pressures.

The impeller design allows for varying number of blades and blade angles. The impellers are dynamically balanced and fit directly onto the motor shafts.

Downstream guide vanes with full inner fairing tube and tail cone are incorporated in each fan to ensure maximum static pressure regain.

Features	High efficiency benefits
Fan design	The aerofoil blade design gives optimum fan performance. Providing higher fan performance with lower power consumption.
Full inner fairing and tail cone	A full inner fairing and tail cone in the fan casing reduces shock losses after passing through impeller and stator vanes, thus maximizing efficiency and reducing noise. For multi-stage operation, an inner fairing spacer is fitted between the stages that allows high-efficiency operation.
Large performance envelope	Adjustable pitch aerofoil blades maximize operational envelope and give reliable high-efficiency aerodynamic performance across a wide range. Blade angles are adjustable at standstill.
Flexible modular design	Modular design for each fan size gives commonality of parts and flexibility on the arrangement, components, number of stages, thus allowing customization if needed.
Anti-stall chamber add-on option	The anti-stall chamber allows for continued safe operation during transient high-pressure events, offering a risk-free process in parallel fan arrangements. This creates a continuously rising pressure characteristic that provides high-pressure capability with a significantly increased operational range. This feature prevents fan stall while pressurizing flexible ventilation ducting.

Jetstream AX



Product design

Howden Jetstream AX auxiliary mine fans have robustly constructed steel casings with heavy gauge flanges at both ends of the casing.

The motor is rigidly mounted within the casing to minimize vibration. The electric motors are flange mounted and can be supplied suitable for differing regional requirements, across the globe. This gives flexibility with voltages, rating and class combinations.

Options and accessories:

- Silencers (inlet and/or outlet)
- Anti-stall chambers
- Self-closing doors/dampers
- Outlet diffusers
- Electrical starters (VSD/DOL/Soft Starter)
- Fan controllers and monitoring (Ventsim CONTROL ready)
- Dual speed motors (1259/1400 sizes)
- Ducting

1. Inlet bell and mesh

Inlet bell is used to maximize performance with durable steel mesh.

2. Impeller blade track

Precision is manufactured, giving low tip clearances to optimize aerodynamic performance.

3. Impeller

Variable pitch impeller design across the full range, pitch angle adjustable at rest.

4. Inner fairing and stator vanes

Aerodynamically optimized to give high performance.

5. Tail cone

Optimize performance by reducing discharge shock losses.

6. Fan casing

Robust construction for mining environments. Houses the motor and straightener vanes.

7. Mounting

Supplied removable mounting feet and multiple lifting and suspension points.

8. Motor

Flange mount motors for ease of assembly. Various motor options available for each fan size. Externally mounted terminal box incorporating bump guards.

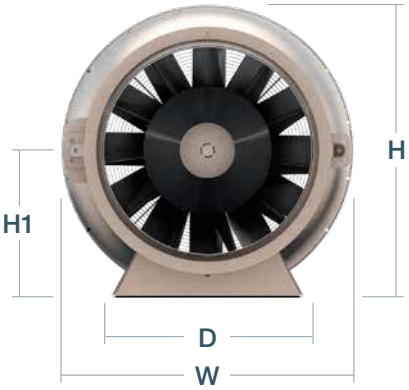
9. Ventilation duct adaptors

Allows connection to standard ventilation duct sizes (inlet or outlet).

Coating protection

All static components are hot-dipped galvanized for durable protection.

Performance and dimensions



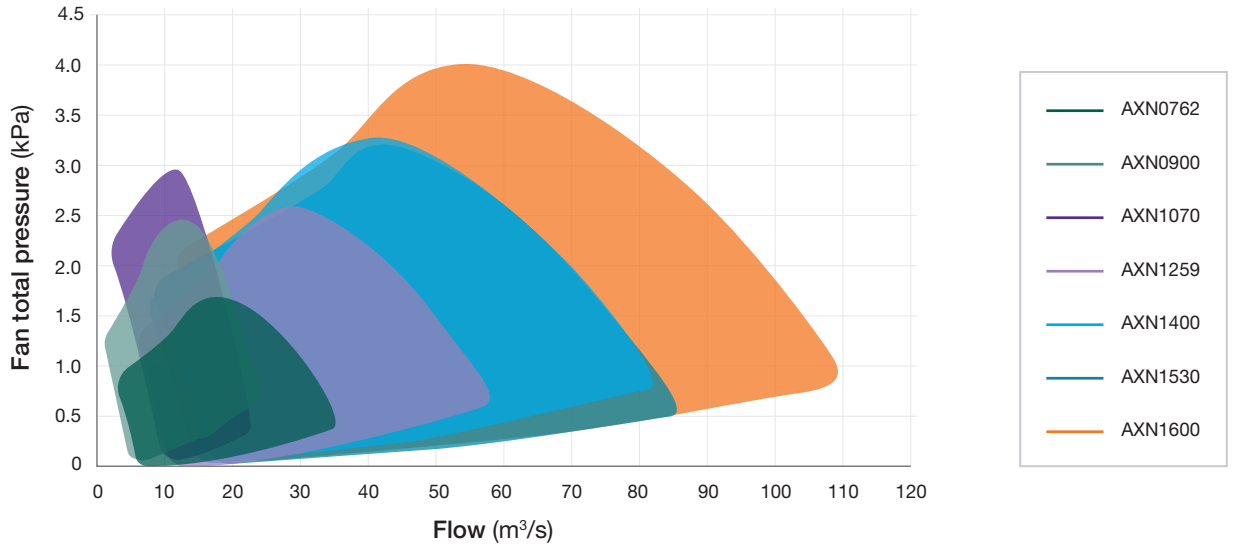
Label	Dimensions and weights	Unit	762	900	1070	1259	1400	1530	1600
L1	Single stage (AXN) length (inc. silencers)	mm	2928	3291	3800	4454	4940	5186	5597
L2	Twin stage (AXT) length (inc. silencers)	mm	3950	4413	4922	5888	6544	6790	7401
D	Fan diameter	mm	762	900	1070	1259	1400	1530	1600
W	Width	mm	1068	1244	1422	1636	1836	1991	2121
H	Height	mm	1066	1206	1416	1659	1851	2015	2101
H1	Fan centreline height	mm	570	620	720	840	940	1020	1060
	Single stage fan (inc. inlet bell and duct adaptor)	kg	780	1100	1250	1490	1930	2010	2670
	Twin stage fan (inc. inlet bell and duct adaptor)	kg	1520	2160	2430	2880	3760	3910	5210
	Inlet and outlet silencers (x2)	kg	140	184	245	325	392	457	495

Performance	Unit	762	900	1070	1259	1400	1530	1600
Flow rate	m^3/s	6.5 – 24	13 – 23	14 – 36	20 – 60	24 – 80	26 – 85	26 – 108
Single stage max fan total pressure *	kPa	2.4	2.9	1.68	2.55	3.21	3.15	3.97
Twin stage max fan total pressure *	kPa	4.8	5.8	3.36	5.1	6.42	6.3	7.94
Speed (60Hz)	rpm	2980	2980	1490	1490	1490	1490	1490
Motor power **	kW	14 – 45	45	30 – 45	55 – 110	75 – 200	90 – 200	110 – 315

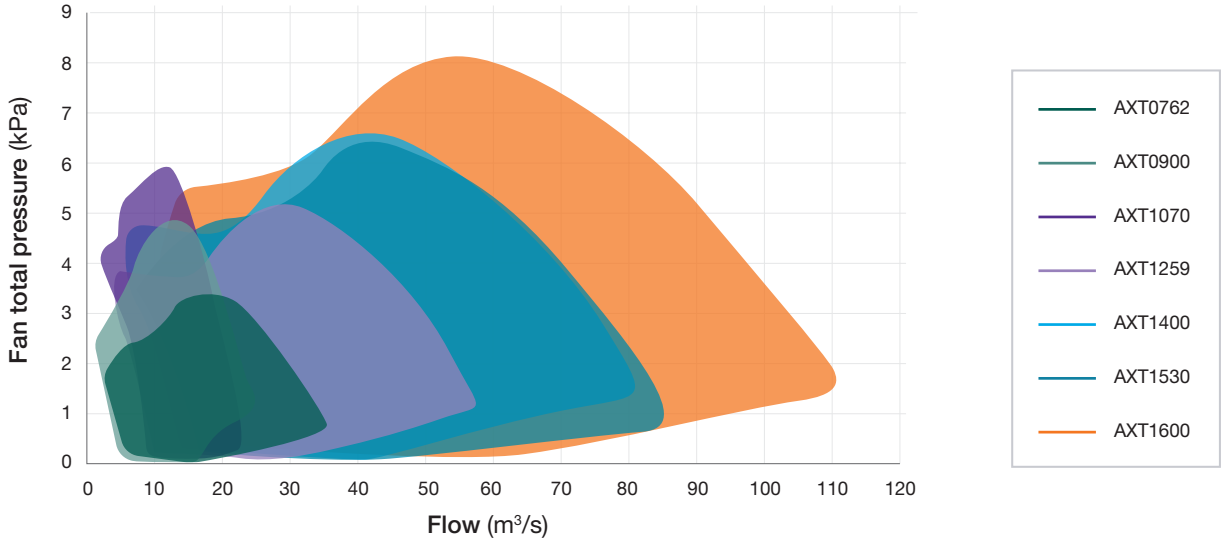
* Based on air density of 1.2 kg/m^3. ** Motors are supplied as standard to IEC E3 efficiency class.

Fan curves

Jetstream AXN (Single) Fan Performance Range (p=1.2kg/m³)



Jetstream AXT (Twin) Fan Performance Range (p=1.2kg/m³)



Fan total pressure based on fan discharge annulus area, carnot loss and accessory losses not included.

An aftercare service to maximize performance and longevity

At Howden, we supply, repair, and replace OEM parts for utility fans, industrial fans, commercial fans, and ash handling systems. They initially were manufactured by more than 40 companies that have been acquired by Howden.

To support these efforts, we also offer:

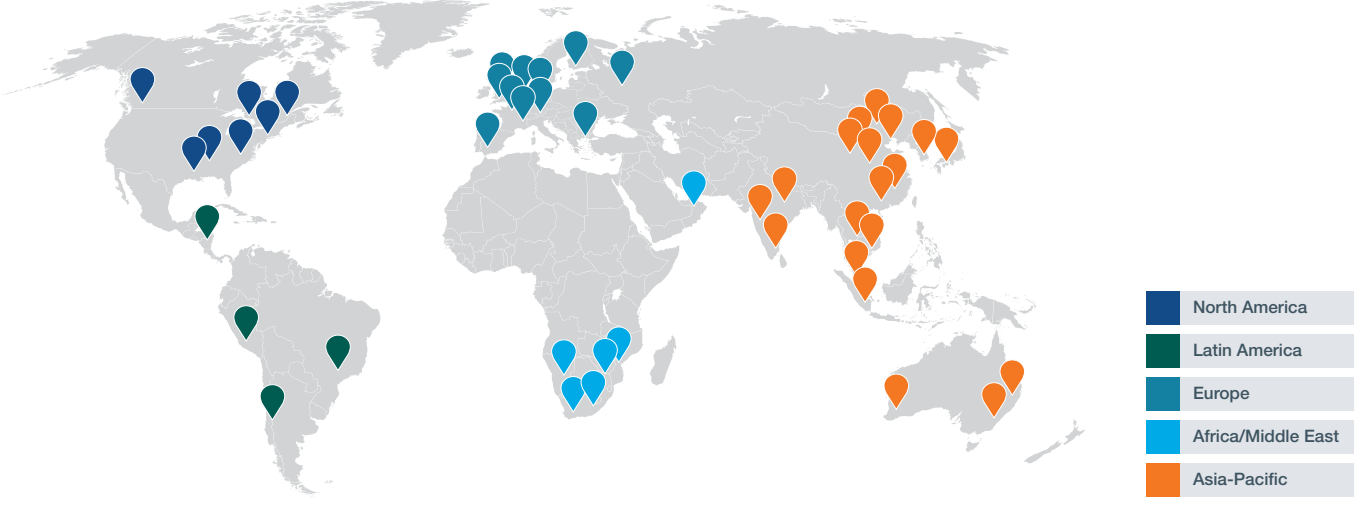
- Performance testing
- Vibration analysis
- Field supervision
- Maintenance contracts
- System analysis
- Turnkey services

Authentic replacement parts and original specifications for most of these former fan manufacturers are only available from Howden.

We also offer the technical expertize and responsive approach you depend on to put your system back in operation as quickly and efficiently as possible.

Moreover, 165 years of knowledge, innovations, and expertize in the mining, industrial, nuclear, naval, and power utility industries make up the collection of companies that comprise Howden aftermarket.

Global presence. Local support.



Click here to find out more about the Jetstream AX or contact your local representative: **global.mining@howden.com**

At the heart of your operations

Howden people live to improve our products and services and for over 160 years our world has revolved around our customers. This dedication means our air and gas handling equipment adds maximum value to your operations. We have innovation in our hearts and every day we focus on providing you with the best solutions for your vital operations.

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