



APPLICATION

Fuel-cell / hydrogen process air

A fuel-cell / hydrogen process-air blower feeds cathode and process air, or ventilates a hydrogen enclosure, in a fuel-cell or electrolyser system. The air must be clean and oil-free so it does not poison the catalyst or foul the membrane; the flow must track cell load closely; and where hydrogen can be present the whole build has to be ignition-safe.

Capability envelope

fuel-cell / hydrogen process-air service

PARAMETER	STANDARD RANGE	ON APPLICATION
Volume flow	up to 2,25,000 CMH	typically modest flow at high static; higher on enquiry
Static pressure	up to 2,000 mmWC	high static at modest flow is the typical duty
Air cleanliness	oil-free flow path, non-shedding finish	stainless / coated wetted surfaces on demanding builds
Flow-control band	±3–5% on VFD / EC speed control	tighter with closed-loop control on application
Construction (ignition)	AMCA 99 spark-resistant + ATEX Zone 2 (Cat 3G) self-declared	
Drive power	up to 425 HP	our largest drive delivered to date
Static efficiency	high static efficiency	higher on high-efficiency airfoil builds
Balance quality	ISO 21940 G6.3	G2.5 / G1.0 on application

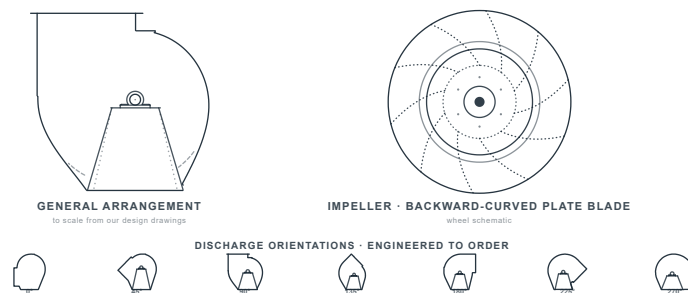


FIG. 1 Representative arrangement — a Jitamitra Backward-Curved Plate fan, the family most often applied to this duty. The exact family and wheel are engineered to your operating point.

Construction & materials

documented on your GA

- **Impeller geometry & control** — Backward-curved or backward-inclined wheel for a steep, stable curve and high static efficiency (higher on airfoil high-efficiency builds); VFD or EC speed control as default so cathode-air flow tracks stack load to within ±3–5% instead of throttling.
- **Hydrogen-safe construction** — Spark-resistant construction per AMCA 99 (Type A / B / C to the risk) with ATEX Zone 2 self-declared per 2014/34/EU (Cat 3G) where the zone calls for it — non-sparking impeller, non-ferrous rub ring, bonded earthing and bearing-temperature control, sized to the gas-group you declare.
- **Clean-air integrity** — Oil-free flow path; shaft seal selected to keep lubricant out of the airstream; non-shedding internal finish; stainless or coated wetted surfaces where the process demands, so the air reaching the cathode does not poison the catalyst or foul the membrane.
- **Ventilation sizing** — For enclosure ventilation the air-change rate is set to dilute a credible hydrogen leak below 25% of the LFL (4% vol), with the fan sized for the enclosure volume, the leak case and the duct resistance — not a nominal air-changes-per-hour figure.

How a Jitamitra Fuel-cell / hydrogen process air fan is specified

AMCA conventions

SPECIFICATION FIELD	OPTIONS
Arrangement (AMCA 99)	Arr. 1 (overhung, fan bearings) / Arr. 4 (direct, motor on base) / Arr. 8 (overhung on common base) / Arr. 9 (overhung, motor side) / Arr. 10 (overhung, motor inside base) — selected by drive, access and enclosure footprint.
Width / inlet	SWSI (single width, single inlet) default for process-air duty; DWDI (double width, double inlet) for higher flow at moderate pressure on larger balance-of-plant ventilation.

SPECIFICATION FIELD	OPTIONS
Wheel type	Backward-curved or backward-inclined (default — steep stable curve, best efficiency on clean air) / airfoil-bladed (highest efficiency on large continuous-duty builds).
Spark-resistant construction (AMCA 99)	Type A (all non-ferrous parts in the airstream) / Type B (non-ferrous rub ring and non-ferrous parts across the shaft opening) / Type C (aligned construction preventing ferrous rotating-to-stationary contact) — selected to the hydrogen ignition risk.
ATEX scope	Zone 2 self-declared (Cat 3G) per 2014/34/EU for hydrogen-exposed duty — non-sparking impeller, non-ferrous rub ring, bonded earthing throughout, anti-static coatings and bearing-temperature control, matched to gas group IIC.
Materials of construction	Mild steel + epoxy coating (standard clean-air build) / 304 or 316L stainless where the process or ambient demands / non-ferrous parts in the flow path for spark resistance / non-shedding internal finish for cathode-air cleanliness.
Drive	Direct-coupled / V-belt / VFD or EC (default for flow tracking across stack load). Drive up to 425 HP across the envelope; speed typically 600–1,800 RPM.
Accessories & acoustic scope	Oil-free shaft seal; inlet filtration interface for cathode-air cleanliness; VFD / EC control and instrumentation interface; inlet and outlet silencers with acoustic-lagged casing (down to <75 dB(A)) for occupied plant-room duty; flexible connections; drain and inspection doors.

Where the Fuel-cell / hydrogen process air runs

RENEWABLE HYDROGEN Electrolyser balance-of-plant ventilation, fuel-cell cathode / process-air supply, hydrogen-enclosure dilution ventilation.	BATTERY & EV MANUFACTURING Fuel-cell test-cell process air, dry-room and enclosure ventilation on hydrogen-adjacent lines.
CHEMICALS & PETROCHEM Hydrogen-handling area ventilation, process-air supply to fuel-cell CHP and pilot units.	SEMICONDUCTOR & ELECTRONICS Clean, oil-free process-air and enclosure-ventilation duty around hydrogen-using process tools.
POWER GENERATION Stationary fuel-cell and CHP cathode-air blowers, ancillary ventilation for hydrogen skids.	OIL & GAS Hydrogen-blending and refuelling-skid ventilation, process-air supply on fuel-cell backup power.
RESEARCH & PILOT PLANT Fuel-cell and electrolyser R&D rigs needing tight flow control and a documented hydrogen-safe build.	YOUR DUTY POINT Send us flow, static pressure and the air / gas condition — we size the wheel to it and quote in 3 to 5 working days — 5 to 7 working days for ATEX and special projects.

Standards & conformity

PERFORMANCE Tested to the IS 4894 / ISO 5801 / AMCA 210 method, in-house on our 200 HP VFD rig. Tested-to-method — not AMCA-certified.	QUALITY SYSTEM ISO 9001:2015 — third-party certified (our only third-party certification).
CE CONFORMITY Self-declared per 2006/42/EC + 2014/35/EU. Not a notified-body certificate.	ATEX CONFORMITY Self-declared, spark-resistant (SR), Zone 2/22 Cat 3 per 2014/34/EU, where area classification requires.
BALANCE & VIBRATION Balance ISO 21940 (G6.3 std, G2.5 on request); fan vibration acceptance ISO 14694, measurement ISO 14695.	WELDING & HEAVY DUTY ASME Sec IX welders + WPS; API 673 available as project-specific scope for oil & gas.

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Figures indicate family capability; every fan is engineered to the customer's duty point and confirmed on the approved GA drawing.