



APPLICATION

Smoke / fire emergency (high-temp)

A smoke / fire emergency fan does almost nothing for years — then, on fire mode, it has to move hot smoke at full duty for the whole rated period at the temperature-time duty and hold time your smoke-control strategy specifies. The duty is not defined by flow alone; it is defined by a temperature-time class — the fan must survive its rated gas temperature for its rated hold time, motor, bearings and drive included.

Capability envelope

smoke / fire emergency service

PARAMETER	STANDARD RANGE	ON APPLICATION
Volume flow	up to 2,25,000 CMH	higher on enquiry
Static pressure	up to 2,000 mmWC	higher on enquiry
Temperature-time class	300 °C / 2 h typical design point	to the temperature-time class stated for the project
Drive location	out-of-airstream drive (preferred)	in-airstream motor rated to the same class where layout forces it
Shaft cooling	shaft cooling disc standard above 400 °C	from 350 °C on request
Drive power	up to 425 HP	our largest drive delivered to date
Speed	600–1,800 RPM typical	per duty + sound limits
Balance quality	ISO 21940 G6.3	G2.5 / G1.0 on application

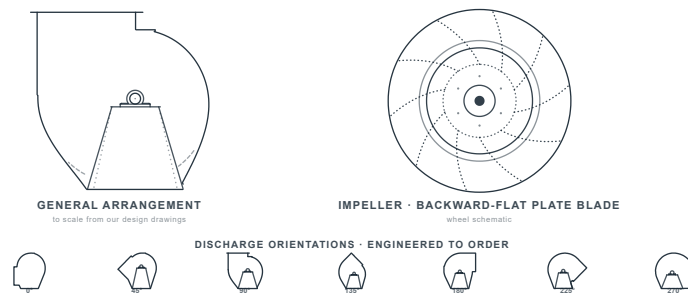


FIG. 1 Representative arrangement — a Jitamitra Backward-Flat Plate fan, the family most often applied to this duty. The exact family and wheel are engineered to your operating point.

Construction & materials

documented on your GA

- **Drive out of the airstream** — Out-of-airstream drive arrangement wherever the installation allows, so the motor never sees the hot gas; a shaft cooling disc (heat slinger) standard above 400 °C and available from 350 °C; heat-rated bearings and high-temperature grease. Where the motor must sit in the stream, it is rated and tested to the same temperature-time class as the fan.
- **Impeller & casing for the class** — Backward-inclined or backward-flat-plate wheel for clean-smoke duty and efficiency; casing upgraded to IS 2062 or SA 516 Gr 70 for the class temperature; running clearances set for the hot condition; construction and weld detail suited to the rated gas temperature and hold time rather than a comfort-fan build.
- **Thermal scope & connections** — Shaft sized for thermal growth; expansion joints / flexible connections at inlet and outlet so the casing can grow without loading the ducting; supports and holding-down arranged to absorb the movement. On 500 °C ceiling duty the thermal package steps up to match.
- **Readiness & control** — Direct-on-line start is common so the fan reaches duty fast on fire mode; a VFD package is available where dual-mode day-ventilation and boosted fire duty share one fan. Construction supports periodic test-running and inspection so the fan's readiness is proven on a schedule, not discovered on the day.

How a Jitamitra Smoke / fire emergency fan is specified

AMCA conventions

SPECIFICATION FIELD	OPTIONS
Arrangement (AMCA 99)	Arr. 1 (overhung, fan bearings) / Arr. 8 (overhung on common base) / Arr. 9 (overhung, motor side) / Arr. 3 (between-bearing) — selected to keep the drive and bearings clear of the hot gas stream wherever the layout allows.
Width / inlet	SWSI (single width, single inlet) default for smoke-extract duty; DWDI (double width, double inlet) for high flow at moderate pressure on large atrium or tunnel extract.

SPECIFICATION FIELD	OPTIONS
Wheel type	Backward-inclined (default, best efficiency on clean smoke) / backward-flat-plate (robust, tolerant of soot build-up) / backward-curved on high-efficiency dual-mode duty.
Temperature–time class	Built and tested to the temperature-time class you state for the project — the standard's own classes run 300 °C / 2 h and the 400 °C range — with the whole assembly built and tested to that class, not a nominal temperature alone.
Materials of construction	MS (standby / lower-class duty) / IS 2062 or SA 516 Gr 70 casing for the class temperature / stainless where the smoke stream is corrosive or the ambient duty is humid coastal air.
Drive & cooling	Out-of-airstream drive (preferred) or in-airstream motor rated to the same class; shaft cooling disc (heat slinger) standard above 400 °C , from 350 °C on request; heat-rated bearings and high-temperature grease. Direct-coupled / V-belt / VFD up to 425 HP , speed typically 600–1,800 RPM .
Discharge & rotation (AMCA orientation)	Rotation CW or CCW (viewed from drive side) with discharge angle per AMCA — e.g. TH/BH/UB/DB — set to match your shaft, duct take-off and the extract riser.
Accessories & thermal scope	Expansion joints / flexible connections at inlet and outlet for thermal growth; shaft cooling disc; heat-rated bearings and seals; isolation / shut-off damper for standby isolation; VFD package for dual-mode day-ventilation duty; inlet / discharge silencer and acoustic-treated casing where the fan runs a daily ventilation duty near occupied space; drain and inspection doors for periodic test and readiness checks.

Where the Smoke / fire emergency runs

COMMERCIAL BUILDINGS & HVAC Stairwell pressurisation and smoke extract, protected-lobby and corridor smoke clearance, atrium smoke exhaust.	CAR PARKS & BASEMENTS Dual-duty CO/NO ₂ dilution on normal mode, high-temperature smoke extract on fire mode, ducted or impulse arrangement.
TUNNEL & METRO INFRASTRUCTURE Emergency smoke extract and supply for road and rail tunnels and metro stations, high-temperature and reversible where the scheme calls for it.	AIRPORTS & LARGE INFRASTRUCTURE Concourse, atrium and large-volume smoke extract in terminals, transport interchanges and public assembly buildings.
DATA CENTRES Smoke clearance and emergency extract for large IT halls, plant rooms and containment aisles where continuity of the escape route matters.	INDUSTRIAL & WAREHOUSING Smoke and heat exhaust for large sheds, warehouses and production halls, sized to the ventilation scheme and rated class.
MARINE & OFFSHORE Machinery-space and enclosed-area emergency smoke and heat extract, corrosion-resistant marine construction built to the specified rated period.	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.