

Stall protection



The cost of installing stall protection is minimal compared to the cost of failure. A stall warning system gives you peace of mind and avoids unnecessary breakdown and production loss.

Stalling on axial fans can be dangerous and cause severe damage to humans and equipment. Fans running in stall for any prolonged period of time may result in blade rupture with the result of costly replacement of major fan parts as well as considerable downtime.

When a fan is operating in the stall zone (fig. 1) the blades start vibrating at their natural frequency, a situation that is only allowed 15 minutes accumulated before the blades are at risk of breaking due to fatigue.

A fan operating in stall will normally expose characteristics of increased sound emission, pulsating air flow near the fan and higher vibration levels than at normal operation. Detecting these characteristics though, without proper stall warning equipment, require expert knowledge of the operator.

The solutions

The simplest solution offered is the Howden patented stall probe (fig. 2), whose sole function is to detect whether a fan is operating in stall or not. Linked to the DCS system, this would allow automatic change of blade angle, to bring the fan out of stall zone, when the probe registers stalling.

Howden recommends a two out of three installation for optimum reliability of the alarm system.



Blade rupture as a consequence of stall



Stall probe

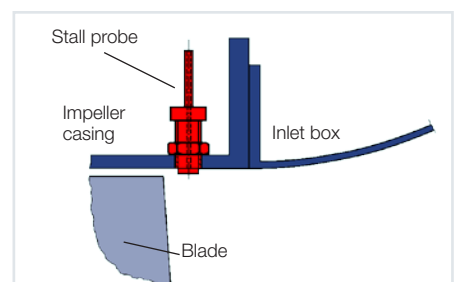


Fig. 2

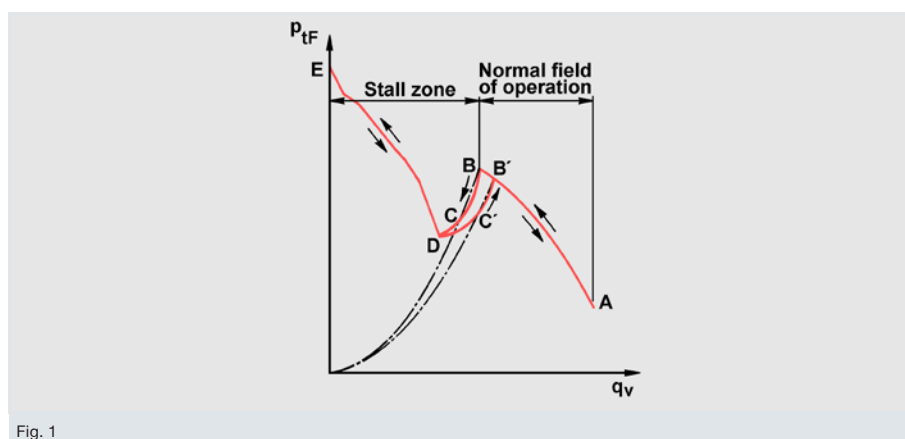
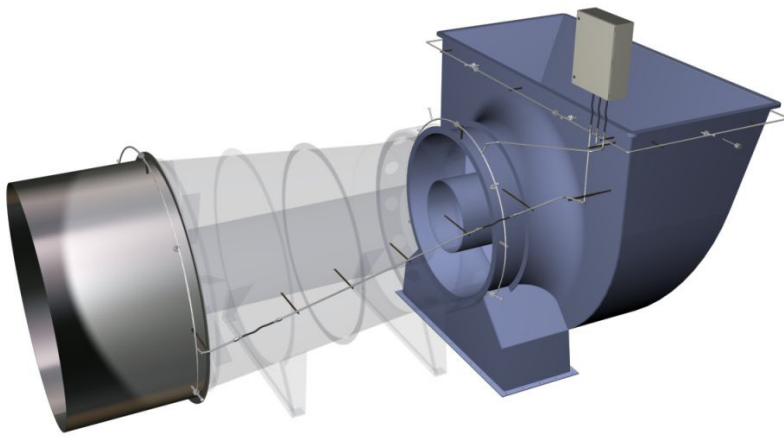


Fig. 1



Stall warning system

For further information on axial fan retrofit solutions please visit www.howden.com or contact your local Howden company.

A more advanced system giving warning before stall is a stall warning system (fig. 3) which protects the fan and ensures reliable, continuous operation of the boiler. Recommended by Howden the stall warning system comprise three measuring pipes, all measuring the static pressure at inlet of suction box, outlet of suction box, and the duct right after diffuser.

An alternative method is the anti stall ring, which works by the principle of catching the stall cells and returning them into the flow,

thereby stabilising the flow at duty points. This method, however, is limited in terms of suitability for all types of blade profiles and may have a negative impact on fan efficiency.

Solution	Purpose
Stall probe	Detects stall
Stall warning	Warning before stall and performance measurement
Anti stall ring	Stall is minimised

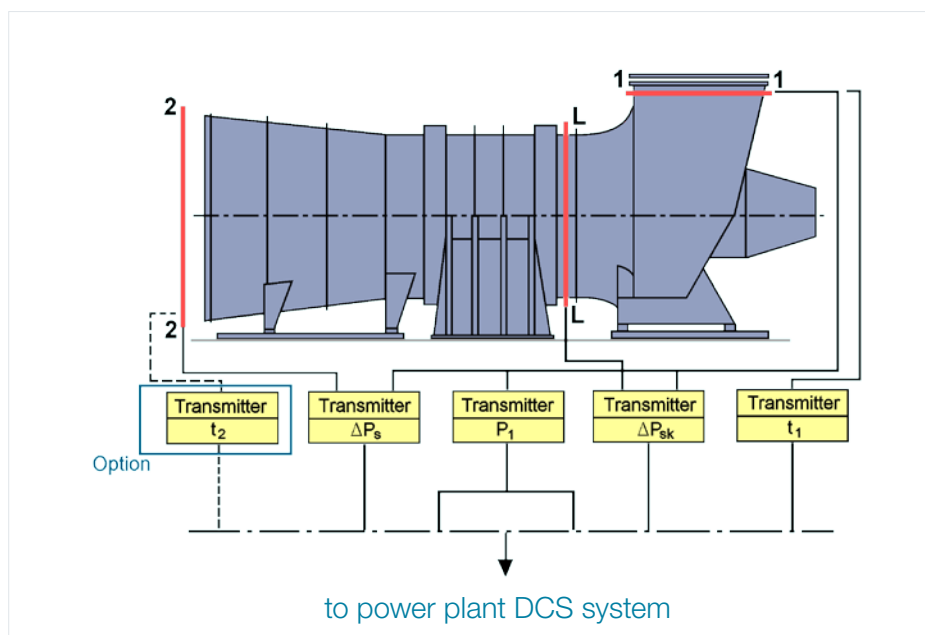
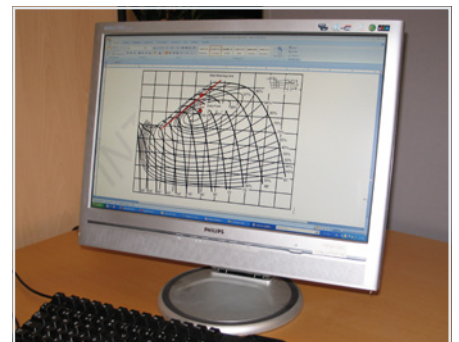


Fig. 3