

InstaKool®

Intake cooling with an instant payback



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AAF®
INTERNATIONAL
Bringing clean air to life.®

The Power of Cooling

Gas turbine inlet cooling reduces the inlet temperature and helps restore lost power output with improved fuel efficiency. Even small increases in ambient temperature above 15 °C can result in significant reductions in power.

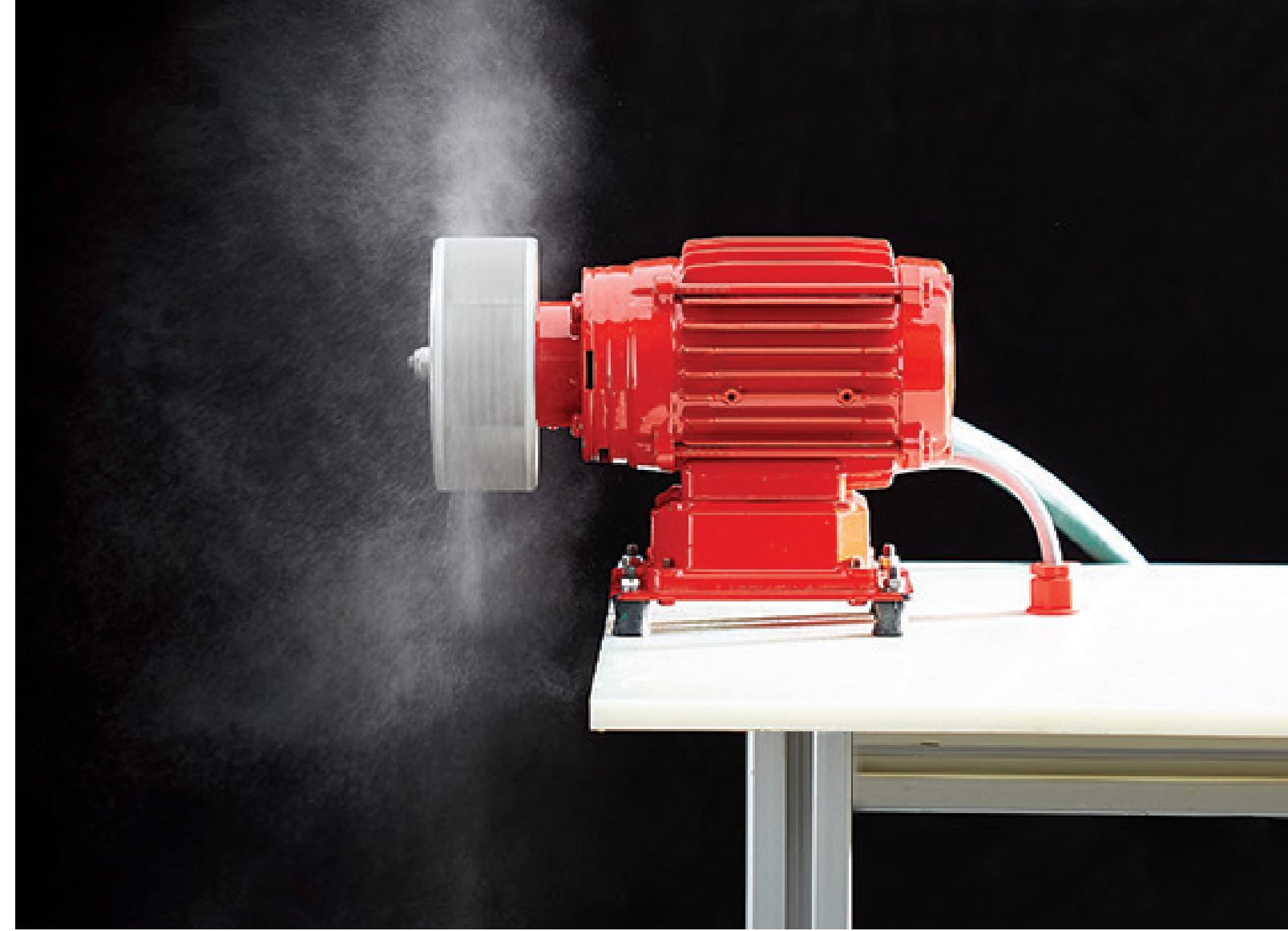
Cooling can benefit countless numbers of gas turbine installations around the world. With summer temperatures often well in excess of 15°C, the additional revenue that can be generated in just one summer can justify the investment.

Regions that experience extreme summer temperatures can naturally have periods of fogging. Research shows that during this process the moisture in the air reduces ambient temperature and increases gas turbine power output. The challenge for AAF was to develop a product that could mimic these conditions with no negative impact on differential pressure.

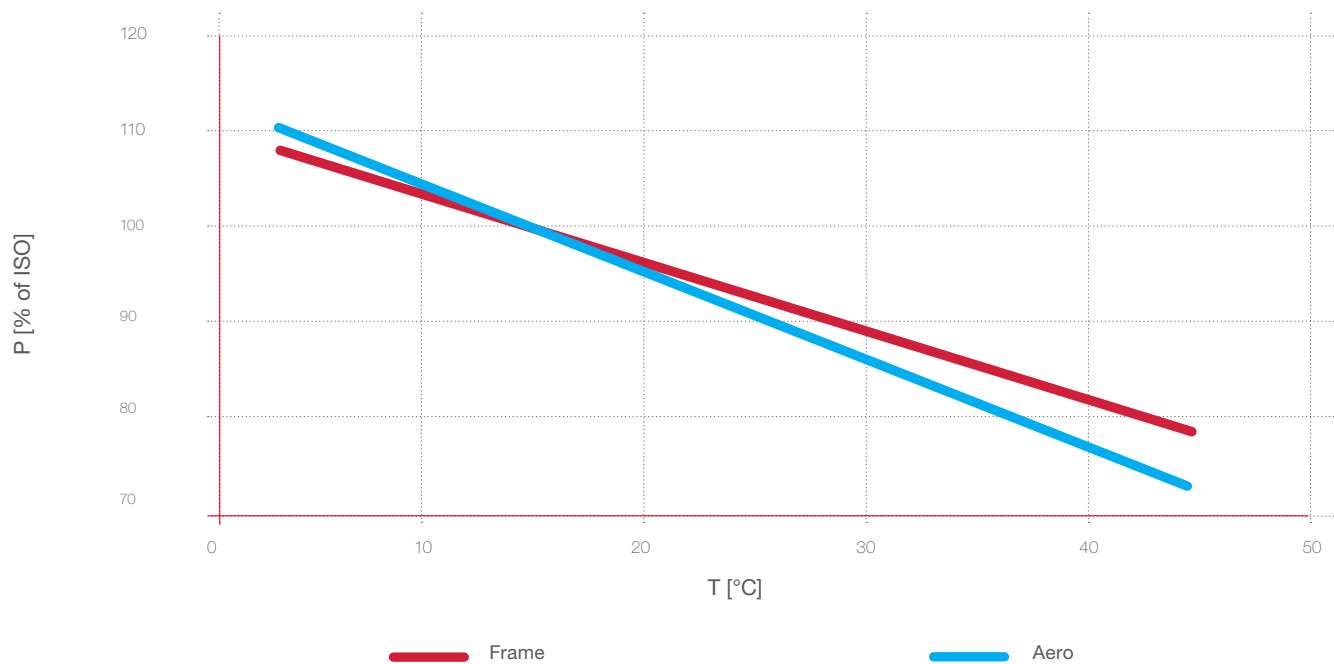
15 °C even small increases in ambient temperature above 15 °C can result in significant reductions in power

0.7 % larger gas turbines lose approximately 0.7 % power per °C

0.9 % aero gas turbines lose approximately 0.9 % power per °C



Power vs Temperature



Introducing InstaKool®

InstaKool is an add-on cooling solution that can be installed and paid back within the lead time of competing technologies. Installed upstream of the filters, it controls relative humidity with everyday water quality. This maximises power output with no structural change to the

existing gas turbine inlet system and minimal impact on differential pressure. AAF can also ensure that the filters downstream of InstaKool provide a reduced TCO (total cost of ownership) and improve overall profitability.

- | Increase operating income
- | Reduce fuel costs
- | Short payback period
- | No structural change to the filter housing
- | Minimal impact on differential pressure
- | No demineralised water required
- | No foreign object damage downstream
- | No corrosion downstream of filters
- | Intelligent air cooling

InstaKool Operational Process

AAF's intelligent PLC control system ensures InstaKool reaches its optimum operating point without incurring a significant increase in differential pressure. The control system adjusts water flow to achieve the lowest possible air temperature, maximising power output. InstaKool is installed in front of the filters, eliminating risks associated with traditional air cooling methods downstream of the filters, including foreign object damage, water accumulation and corrosion.

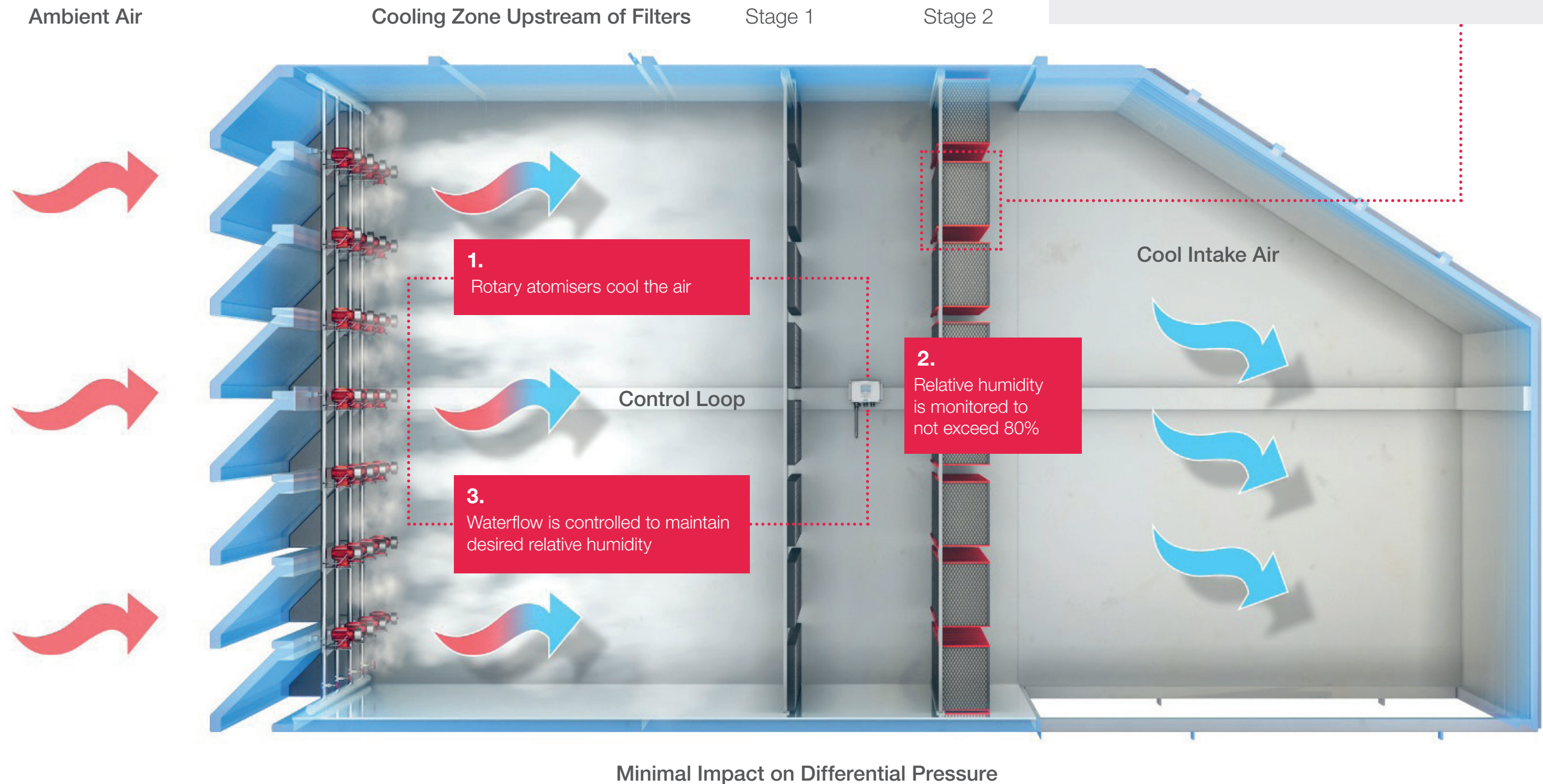
Choose the Right Air Filters

AAF's wide range of air filters provide the ultimate protection for your gas turbine, even in the most demanding of operating environments. This includes AAF's flagship HydroGT filter, delivering reliable performance and power output even during moist and humid conditions.

AAF's proprietary media repels water, oil, hydrocarbons and salt, significantly reducing compressor fouling and the need for offline water washing. This results in maximum available power output, increased machine availability and reduced operational costs.



Filtration Stages



Please note: The location of the atomisers, relative humidity probe and control panel will vary depending on the individual installation. The layout shown is for illustrative purposes only. Speak to your AAF representative for the best advice on options for your individual installation.

Optimum Operating Point

InstaKool is programmed to automatically run at its optimum operating point to maximise power output.

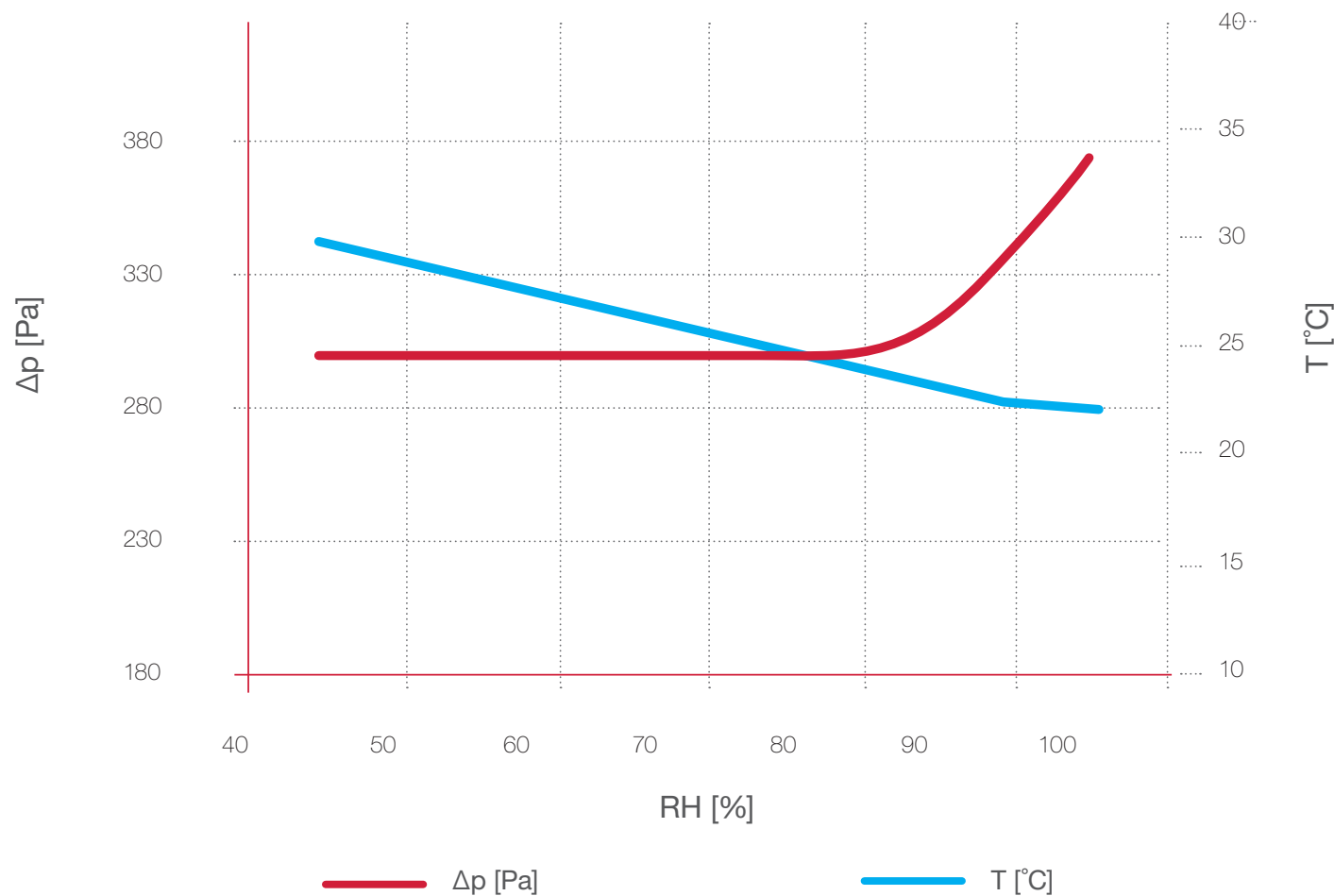
The optimum operating point is reached when relative humidity is at 80%. This occurs when the temperature is at the lowest possible without negatively impacting differential pressure.

InstaKool continually measures temperature, relative humidity (both upstream and downstream) and differential pressure. Water flow is adjusted accordingly to suit the environmental conditions, with no impact on droplet particle size distribution and minimum impact on differential pressure.

Typical example:

45 °C	Ambient temperature
33 MW	Power output at ambient temperature
24 °C	Temperature downstream of InstaKool
39.5 MW	Power output after InstaKool
20%	Uplift in power output from InstaKool
15 kW	Power consumed by InstaKool
433:1	Ratio of power gain / power consumed

The Relationship between Temperature, Relative Humidity and Differential Pressure



Comparing Technologies

The innovative InstaKool system design offers customers many additional benefits when compared with conventional cooling technologies, including high pressure fogging systems and evaporative coolers.

Comparison Table

	InstaKool	Conventional cooling
Location of technology	Upstream	Downstream
Δp penalty	<25 Pa	250 Pa (evaporative cooler)
Lead time	3-4 weeks	26 weeks
Installation	Up to 7 days	Up to 28 days
Water	Not sensitive to water quality	Demineralised or high quality water
Power consumption	Low	Low to medium
Foreign object damage	Zero potential	High level of risk

Optimize Your Gas Turbine



AAF Optimize is a data driven evaluation tool that is used to forecast the potential savings that could be achieved with InstaKool. The same platform can also be used to ensure you select the optimum air filters for your plant.

Optimize assesses your site's operational, commercial, and environmental data to evaluate the current impacts and losses associated with your air inlet filtration system.

The service is supported by an expert team and a detailed proposal will be sent to you that will evaluate alternative solutions and compare cost benefits. There is no commitment to proceed and the focus is to ensure gas turbine reliability, availability and efficiency are all optimized.

Speak to your AAF representative to find out more.



Bringing clean air to life.®

A light gray world map is centered in the background of the page, showing the continents of North America, South America, Europe, Africa, Asia, and Australia.

AAF International

Filtration has been at the heart of our business since 1921 and thanks to the high calibre of our products and services, we are trusted by many of the world's leading power and industrial companies. We provide our customers with the expertise, the solutions and the best available filtration technology to increase operational performance. Bringing clean air to life, our products provide the highest levels of indoor air quality, the lowest environmental emissions and the optimum safety conditions for employees and the wider community.

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