Combustion Air Fan Control

Energy efficient fan control for industrial burners
Modern Combustion Control
With OPTIDRIVE™ variable speed drives

Improve Burner Performance, Reduce Overall Energy Costs

Burners are widely used across many applications and industries to provide a controllable heat source. Traditional burners incorporate control systems utilising mechanical methods to control the amount of air and fuel supplied, and thus controlling heat output. These systems may be difficult to correctly commission and, through gradual wear over time, can result in an incorrect air / fuel ratio being used thus wasting energy and increasing operating costs.

OPTIDRIVE™ variable speed drives provide a cost effective, energy efficient method to directly control the air supply fan speed, negating the requirement for mechanical dampers and ensuring that the correct amount of air is supplied under all conditions. Controlling fan speed directly provides the most energy efficient method, and allows the fuel ratio to also be adjusted in relation to air pressure, minimising mechanical linkages and ensuring that the correct air / fuel ratio is maintained throughout the burners operating life.

Using OPTIDRIVE™ also greatly improves burner safety, ensuring the burner operates within safe limits at all times. As a result, burner ownership costs are greatly reduced, and fuel is used efficiently throughout the burner operating lifetime.

Installation of OPTIDRIVE™ Variable Speed Drives to control combustion air fans can significantly reduce energy consumption

Saving electrical energy

Optimum combustion through O₂/CO regulation

Improved burner running costs
Save Energy, Fuel & Money
- Reduce electricity consumption through fan speed control
- Reduce fuel consumption through optimised air / fuel ratio

Reduce Maintenance Costs
- Simplified mechanical arrangement reduces wear
- Prolonged motor life through reduced operating speed & load

Improved Safety
- Maintain Correct air / fuel ratio during changing operation
- Reduced risk of CO creation
- Improved control ensures the correct temperature setpoint is maintained more accurately

OPTIDRIVE™
Variable Speed Drives

- World leading motor control
- Easy to use
- Simple to commission
- Easily integrated with combustion systems
- Rugged, robust design

Improve efficiency for new & retrofit burner applications

Technology that pays for itself
Save Energy, Fuel & Money

Variable speed fan and pump control for efficient combustion management

Electronics technology in burner control systems delivers performance improvements, creates significant cost savings and reduces pollutants. Replacing butterfly valves, or other flow control methods with an Optidrive provides the most energy efficient method to precisely control combustion airflow, allowing the optimum air / fuel ratio to be consistently achieved.

Reducing fan speed by as little as 20% can reduce energy consumption by up to 50%.

Reduced Maintenance Cost

Traditional mechanical linkage between air and fuel supplied are inflexible and prone to sticking, and are subject to wear during operation. This may allow the adjustment to become incorrect over time, and requires correct maintenance to ensure the air fuel ratio is maintained. Using an OPTIDRIVE™ to directly control the supply air fan speed eliminates the mechanical methods require, dramatically reducing the maintenance required to maintain optimal operation of the burner.

Reduce Noise Emissions

Reducing the speed of the air supply fan also helps to cut the noise level produced from the burner, leading to a better working environment.
An efficient burner provides the proper air-to-fuel mixture throughout the full range of firing rates, without constant adjustment.

**Optimise Combustion**

Insufficient air supplied to the burner leads to incomplete combustion. This wastes fuel, and creates harmful pollutants. Most burners will generally operate with excess air, however when excess air levels are increased, additional energy is used to heat the air, increasing operating costs. Using an OPTIDRIVE™ to control the fan speed, air flow can be accurately controlled, allowing fuel usage to be optimised further, and ensuring that air / fuel ratios are maintained regardless of the required operating temperature level of the burner. This leads to energy savings, and fuel usage savings.

Electronic technology in burner control systems delivers performance improvements, creates cost savings and reduces the risk of harmful pollutants. By utilising feedback sensors to monitor operate, and incorporating an OPTIDRIVE™ variable speed drive to directly control fan speed, precise control is possible during all operating conditions, saving energy, reducing wear and minimising fuel consumption.

**Integrated Feedback Systems**

A temperature feedback signal can be fed directly to the Optidrive (e.g. 0 - 10 Volt, 4 - 20mA, 0 - 20mA), allowing the OPTIDRIVE™ to automatically maintain the correct airflow. When reduced airflow is required, the OPTIDRIVE™ will automatically reduce the fan speed, leading to direct energy savings. The resulting air pressure can then be used to directly control the fuel flow, maintaining correct air / fuel ratios under all conditions.

**Electrical Power Savings**

OPTIDRIVE™ variable speed drives are widely used to control the speed of fans in many different applications, as they represent the most energy efficient solution to controlling airflow levels. Traditional mechanical methods such as dampers are highly inefficient, and significant savings directly in electrical energy consumption are possible simply by replacing these methods with an OPTIDRIVE™ variable speed drive.

The graph above shows the typical performance of a damper compared to an OPTIDRIVE™, in terms of the energy required to provide the demanded airflow. With a traditional damper system, as airflow is reduced, energy consumption reduces by only a small amount, however the OPTIDRIVE™ provides significant energy savings even with only relatively small reduction in speed. This is possible thanks to the fan law, which shows that the energy required by a fan is directly proportional to the cube of the fan speed.
Improving Combustion Systems
Precise air modulation for efficient combustion

Increasing fuel prices, & stringent targets for CO₂ emissions are prompting action to improve combustion efficiency.

Key Features

- Simple control interface for easy inclusion into burner control systems
- PI / PID control
- Preset speeds
- Ease of use

Industries & Applications

- Burner OEM
- Boiler OEM
- Pharmaceutical
- Car production
- Chemical process
- Petro-chemical
- Grain Drying
- Textile Machinery
- Painting Booths
- Rotational Moulding
- Cleaning-in-Place (CIP)
- Crate Washing
- Parts Washing
- Anodising
Combustion

Simple Commissioning
14 parameter basic setup. Default settings suitable for most applications. Contactor style connection for simple wiring.

Compact Enclosures
Small mechanical envelopes to help minimise your space requirements.

Industrial Ambient Ratings
Up to 50°C operation.

Easy Integration
Flexible communication options.

World Leading Motor Control

Saving Energy / Reducing CO₂
With large scale increases in global energy costs and the introduction of taxes and legislation relating to the industrial production of CO₂ gases the need to reduce energy consumption and save money has never been greater. OPTIDRIVE™ variable speed drives can be used with environmental sensors to reduce speed in burner applications without compromising the required output of the system.

Easy Installation
Compact and modern design utilising the latest available technology has accumulated in robust drives with small dimensions and innovative mounting and cabling features.

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For full product details, visit www.invertekdrives.com
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✓ Easily integrated with combustion systems
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Invertek Drives

✓ Sales, service & application support in over 80 countries
✓ World-class production, innovation & training facilities at UK headquarters
✓ Global assembly cells controlled by cloud-based manufacturing database
✓ ISO 14001 environmental & ISO 9001 quality management systems