

## Integrated Module—Plug and Play

Perfect for the retro-fit upgrade situation, the integrated FSD module manages everything you need to allow you to upgrade your asset to the latest technology. The FSD integrated Module manages power, input and output for you. Designed to be compatible with most air driven installation types, the module is intelligent, configurable and easy to work with.



- **Simplify Replacement and Upgrade**

The sub module allows a simplified piping arrangement to “insert” the FSD turbo booster in place of an existing air driven booster without any significant change to any existing Gas Conditioning Panel

- **“Firewalled” and Segregated**

The sub module does not interfere with your existing Gas Conditioning Panel—it extends it. The booster is in a self contained module that is “Firewalled” from existing equipment that can even be removed and the installation fully reversed if it was ever required

- **Plug and Play**

With integrated input and output, interface to local DCS systems is easy. Using typical start, stop, run and monitoring logic, any configuration can be pre-programmed to simplify any installation

- **Monitor and Check**

All sub modules are provided with Self Check functionality to ensure the module is functional so you know in advance of any planned start-up or shutdown the booster is reliable, available and there for you when you need it

- **Just add Power**

Literally just add power and I/O to get the sub module functional. This wonderfully simple upgrade path is the most cost effective way to protect your assets with the latest technology



The QFX range of gas conditioning boosters has been developed by the UK based product development partner QFX Ltd in cooperation with Fluid Science Dynamics. Fluid Science Dynamics are the official sales and Development partner for QFX products in the Asia Pacific, Middle East and Africa regions.

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## Contact Us

For more information on the FSD Gas Booster Solutions and Gas Conditioning system solutions please contact FSD or our appointed representative.



Fluid Science Dynamics (S) Pte Ltd  
1 Commonwealth Lane  
#09-29 One Commonwealth  
Singapore 149544

ROC: 200915444D  
Tel : +65 6659 2282  
Fax : +65 6659 2262  
www.fluidscdynamics.com



# WHY THIS TECHNOLOGY CHANGES THINGS

Technology changes, and making the best choice for gas conditioning systems has become easier and simpler with the FSD QFX Turbo Gas Booster.

This short paper examines the reasons to change to this new technology and what that change means to you

## GAS CONDITIONING SOLUTIONS FOR THE TURBO MACHINERY INDUSTRY GAS HANDLING SOLUTIONS

Fluid Science Dynamics (S) Pte Ltd  
1 Commonwealth Lane, #09-29 One Commonwealth,  
Singapore 149544

ROC: 200915444D  
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## The Air Driven Booster

In many cases Air Driven Boosters are the ideal solution for gas conditioning. They offer many advantages and the FSD QFX range of air driven booster is the highest performing air driven range on the market today having been designed specifically for the protection of gas compressor dry gas seals.

However, as technology advances, the new benefits of the Turbo Booster from FSD QFX are now beginning to outweigh all existing air driven technologies.

## The Air Drive Supply

The first issue with an air driven booster is the air drive supply itself. By approaching the booster in a different way using electric power, the air drive supply is removed. The numerous benefits of this approach include:

- **Cleanliness**

The air supply must be clean to an ISO class to avoid contamination of the drive system. This requires external filtration and conditioning of the air drive supply to ensure this cleanliness level

- **Dryness**

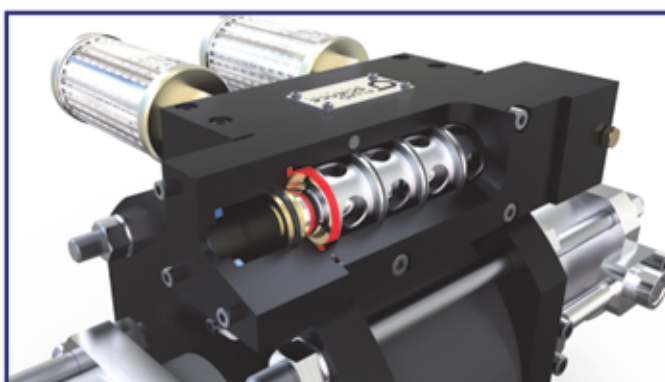
All air when compressed captures the moisture in the air once compressed. This moisture may cause icing of the air drive when the booster drive air is released from the drive exhaust. Dryers and/or dehumidifiers are then required to reduce any moisture to ensure icing is not a problem for the booster

- **Capacity**

For larger compressor shaft sizes the gas flow requirements can be quite high. This means the air driven booster is physical large for high outputs which will then lead to high air drive consumption figures. This can put high demands on the air drive supply of the site

- **Efficiency**

Consuming power to compress air and then using this air to drive other devices is not the most efficient. The overall power efficiencies of any air driven booster in comparison to the FSD electrical drive option is less. Direct electric drive is simply more efficient



- **Availability**

A major problem is that often air drive in sufficient volumes and quality is simply not available at many sites. The infrastructure needed to provide such a supply sometimes becomes a major challenge in itself. Direct electric drive is a simpler and almost certainly available choice

- **Installation**

The air drive supply to the booster requires other devices such as filters, pressure control regulators, speed control ball valves, start/stop valves and monitoring instruments. These devices along with the installation design overhead, installation space and installation time add space, complexity and a growing parts count

These more complex systems also mean there is more to fail and therefore more to maintain



## The Reciprocating Booster

As well as the challenges of the air drive supply itself, the air driven booster uses a piston rod that reciprocates to drive a single or dual process gas pistons act as a positive displacement “pump”. The FSD QFX Air driven boosters are the highest output boosters available on the market today, offering outputs sometimes 5 times that of competitive alternatives.

Although these high efficiencies make these the best air driven booster choice there are still limitations and disadvantages.

- **Piston Rod Seals**

The main drive piston rod of the air driven booster must be sealed from the outside atmosphere. The FSD air driven boosters are fitted with multiple piston seals making them the most reliable of choices. However, these seals will wear as any reciprocating seal will

- **Planned Maintenance**

As the piston seals wear, an issue is understanding or predicting when the piston rod seals actually require replacement. The conservative approach is to plan frequent maintenance. This means there is higher down time for the booster and a suitable maintenance programme must exist

- **Monitoring**

A more effective approach is to monitor the seal behaviour. This is done by collecting any leakage emitted from captured vents and quantifying leakage either by flow measurement or pressure changes over a vent orifice. These installations require expensive instruments that consume space, cost and add to system devices that require maintenance and management

- **Moving Parts**

Any positive displacement booster has pistons, check valves, seals and so on. These are all parts that either move, wear or require maintenance over time

## System Integration and Control

When an air driven booster is used in a gas conditioning system, it has external control and monitoring requirements which mean integration into some form of control system. Air driven boosters can sometimes create complicated and challenging integration tasks.

- **Controllability**

Air driven boosters will experience different running seal frictions at different settle out running pressures. These different friction forces mean achieving a fixed running speed, and therefore flow rate, is extremely difficult. Sometimes the output can at best, be roughly estimated and no air driven booster will escape this reality without extremely complex and costly stroke control systems

- **Monitoring**

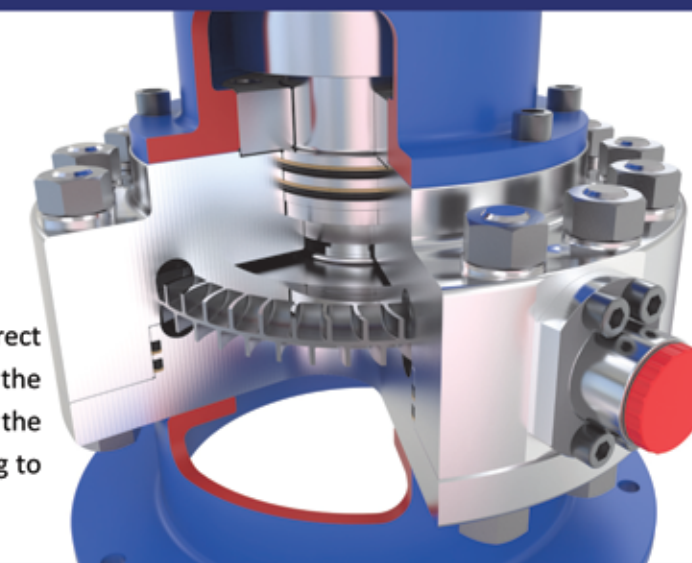
When an air driven booster is running it is often hard to be sure of flow output. The usual approach is to monitor stroke rate and stroke count. However these

pose challenges for integration into external control systems such as the speed of signal collection and the hardware for this monitoring. Strokes can be missed leading to incorrect system readings. The only solution is more complex monitoring devices leading to further integration costs, challenges and parts count



## The FSD Solution

This technology changes everything. This direct electrically driven gas conditioning booster is the only electrically powered booster designed from the ground up, inside to outside for gas conditioning to protect your valuable dry gas seals.



- **No Air Supply**

No need for a high capacity, high quality and costly air drive supply. Savings in physical size and a much more simple installation

- **Significant Wear Reduction**

No piston seals or other replacement items to wear out and plan maintenance for. Longer operating life between planned service

- **No leakage Losses**

The direct magnetic coupling design means there are no seals to wear out. There is therefore no seal leakage and no need for costly seal performance monitoring devices required in API 692

- **Higher Efficiency**

Direct electric drive offers the best levels of efficiency using the regenerative turbine technology of the FSD QFX Turbo Booster

- **Higher Reliability**

The vastly increased interval to maintenance makes a gas conditioning system that is reliable, available and carries a huge reduction in operating expenditure

- **System Integration**

Hugely simplified system integration requiring simplified input and output signals to implement a basic system with vast potential for intelligent system integration

- **System Intelligence**

The FSD QFX Turbo Booster can be provided with an intelligent interface module that can read pressure and temperature signals, perform structured start/stop tasks to further increase system intelligence

- **Enhanced System Intelligence**

Embedded technologies allow a booster master module to communicate with the host system in real time and understand flow, pressures, running times, maintenance intervals, health and more. The control and monitoring possibilities are simply limitless

