



Variable Frequency Drive Modernisation Kit

Energy and cost saving, providing a great return on your investment

VFD / Modernisation Kit

One of the most successful energy management 'tools' ever applied to building HVAC systems is the variable frequency drive (VFD). For more than 20 years, VFDs have successfully been installed on fan and pump motors in a range of variable load applications. Energy savings vary from 10% to 35% over conventional constant speed applications, resulting in a return on investment between one to three years.

The chiller compressor has the largest draw of energy usage. By applying a VFD to your compressor, it can offer you effective energy / cost saving, resulting in a great

return for your investment.

Most conventional buildings are designed for their HVAC systems operating at full load, where in most cases, they only utilise the full load capacities for short periods of the year. Therefore the need for improved part load performance is in greater need now, than ever before, by applying an energy saving modernisation kit, your chillers can achieve just that.

Furthermore, this is available on ALL brands HVAC equipment from Daikin Applied Service.

- AHUs
- CHILLERS
- PROJECTS
- SERVICE

VFD Benefits

The most significant benefit to using a VFD is energy savings. By matching system capacity to the actual load throughout the entire year, major savings in system motor energy use are achieved.

Another benefit of the units is reduced wear and tear on the motors. When an induction motor is started, it draws a much higher current than during normal operation. This inrush current can be three to ten times the full-load operating current for the motor, generating both heat and stress in the motor's windings and other components.

In motors this start and stop frequently contributes to early motor failures. In contrast, when a motor connected to a VFD is started, the VFD applies a very low frequency and low voltage to the motor. Both are gradually ramped up at a controlled rate to normal operating conditions, extending motor life.

VFDs also provide more precise levels of control of applications, the compressor motor operates at full speed and the loading and unloading of the compressor is done so internally in a mechanical way, when applying a modernisation kit (VFD) we fix the compressor at full load (mechanically) and oscillate the compressor motor to control the load required, this results in less energy usage.

Savings case study

McQuay MNG SE ST 145.2 air cooled chiller with a VFD applied based on Eurovent ESSER load profile, for the example:
Unit operating for 12 hrs per day, 5 days per week, 52 weeks per year, the total estimated saving would be around £11,000.00 per year on a 510kW chiller.

Load %	Duty kW	McQuay MNG 145.2 SE ST air cooled chiller Fixed Speed		McQuay MNG 145.2 SE ST air cooled chiller Variable VFD		Saving kW/hr
		Input kW	EER	EER	Input kW	
100	510	186.9	2.73	2.73	186.9	0
75	382.5	128.9	2.97	4.455	85.86	43
50	255	84.7	3.01	4.515	56.48	28.2
25	127.5	36.7	3.47	5.205	24.49	12.2
		ESSER	3.09	4.6		

Controls Upgrade

Part of the Modernisation Kit is to also upgrade the controls, this can be upgraded to the modern Siemens controllers. By upgrading the controls, will enable the easier connection to 'Daikin on Site (DoS)', which is the Daikin Applied UK's 24/7 remote monitoring system.



For more information email info@daikinapplied.uk or visit www.daikinapplied.uk

For all Daikin Applied UK,
Daikin Applied Service &
Spares enquiries call us on:
0345 565 2700



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