



Department for  
Business, Energy  
& Industrial Strategy



**Energy Technology List**

# **Compressed air equipment**

A guide to energy efficient equipment listed on  
the Energy Technology List (ETL)



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# Introduction

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## Energy Technology List

The ETL is a government register of energy saving products. When you select products from the list you are choosing from amongst the most energy efficient products in the marketplace.

When replacing equipment, businesses are often tempted to opt for equipment with the lowest capital cost. However, such immediate cost savings may prove to be a false economy. Considering higher energy efficient products, means that life cycle costs are reduced, improving cash flow in the longer term.

Businesses can also claim accelerated tax relief through the Annual Investment Allowance (AIA) for investments in plant and machinery equipment. The AIA has been temporarily increased to £1 million from January 2019.

**This leaflet illustrates the benefits of investing in compressed air energy saving equipment which qualifies for the ETL.**

The ETL comprises two lists:

- **Energy Technology Criteria List:** defines the performance criteria that equipment must meet to qualify for the ETL;
- **Energy Technology Product List:** is the list of products that have been assessed as being compliant with ETL criteria.

Eligible compressed air products on the ETL can be searched at:

[https://etl.beis.gov.uk/engetl/fox/live/ETL\\_PUBLIC\\_PRODUCT\\_SEARCH](https://etl.beis.gov.uk/engetl/fox/live/ETL_PUBLIC_PRODUCT_SEARCH)



## Setting the scene

**Further information**  
For more information see  
the Carbon Trust's  
Compressed air guide  
(CTV050).

### Energy Technology List

Significant efficiency improvements to compressed air systems can be made by installing the ETL recommended equipment outlined in the guide.

Compressed air systems are used throughout industry with at least 80% of industrial applications using compressed air in one or more of their processes.

Compressed air systems are large consumers of energy consuming around 10% of all industrial electrical consumption or 8.8 TWh each year resulting in CO<sub>2</sub> emissions of 3,100 kt/year.

Around 15% of compressed air systems have more than one compressor. These systems account for approximately 1.3 TWh or 470 kt CO<sub>2</sub> each year.

The efficiency of compressed air systems is often poor. Typical causes include:

- Ad hoc system expansion
- Air leaks
- Poor control
- Over pressurisation
- Inappropriate use
- Inefficient ancillary equipment (e.g. Dryers)

**Air compressors themselves are not listed on the ETL. However, compressed air dryers and controllers are included on the ETL.**

In the majority of compressed air systems efficiency improvements can be made by installing improved controls, such as master controllers and flow controllers. Further energy savings can be achieved by replacing low efficiency dryers with more efficient dryers (refrigerated and desiccant types) which incorporate energy saving controls. Although air compressors themselves are not listed on the ETL, motors or drives within the compressor unit are ETL listed.

# Compressed air equipment on the ETL

The following sections describe the compressed air equipment covered by the ETL. The diagramme below identifies those components that are eligible and their relation to each other.

Compressors and air receivers are not listed on the ETL, but master controllers and refrigerated and desiccant air dryers are.

Master Controllers



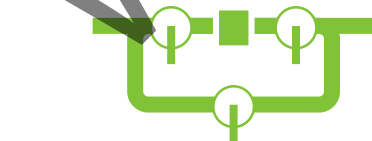
Compressors  
(not eligible for ETL)



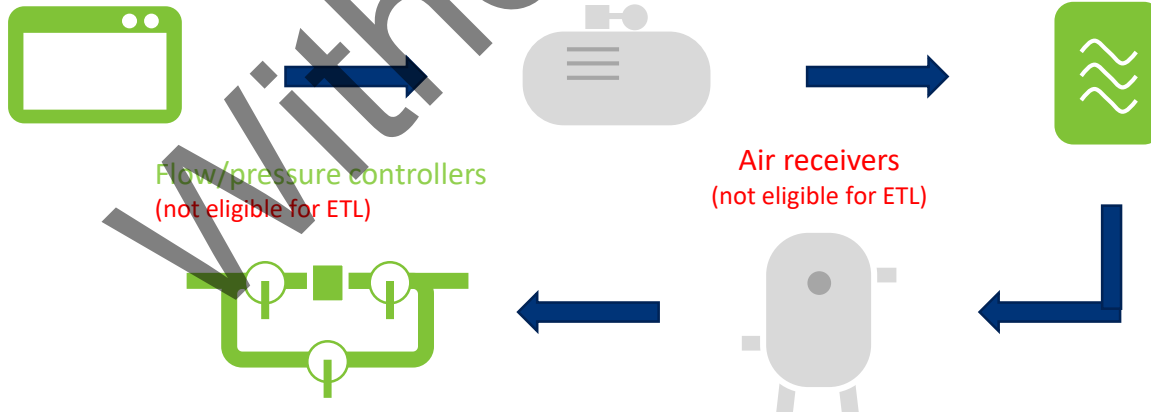
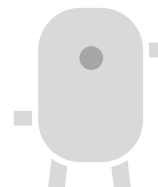
Refrigerated /  
desiccant dryers



Flow/pressure controllers  
(not eligible for ETL)



Air receivers  
(not eligible for ETL)





# Compressed air equipment listed on the ETL

## Assumptions

ETL listed compressed air products must meet defined energy efficiency levels under various load conditions. In this document, the baseline scenario below has been used to calculate the potential financial (£), energy (kWh) and carbon savings (tonnes CO<sub>2</sub>) unless otherwise indicated:

- Compressed air system operates continuously for 8,000 hours per year
- Price for electricity 11.14p/kWh
- Carbon emissions for electricity 0.35156 kgCO<sub>2</sub>/kWh
- Price for gas is 2.59p/kWh
- Carbon emissions for gas is 0.18416 kgCO<sub>2</sub>/kWh
- ETL listed products are presumed to be in the top 25% of energy efficient products available in the marketplace

Energy cost and emissions data from BEIS 2017



© Atlas Copco



# Products eligible listed on the ETL:

Master controllers are covered by the ETL.

## Master Controllers

- Controlling multiple compressors around a single set pressure prevents pressure fluctuation common in simple cascade or sequence controls
- Optimising which compressors are selected ensures that utilisation is maximised while closely matching demand
- Predicted stop/start based on pressure decay optimises system performance by predicting when best to start/stop or load/unload the next compressor in sequence by monitoring the decay/rise in system pressure
- Variable pressure according to production demand can also be used to vary pressure according to specific production requirements, e.g. lower weekend pressure

Example: For a compressor with a 90kW capacity, delivering 14.25 m<sup>3</sup>/min for a total of 8,000 hours per year at full load, the potential savings of installing an ETL listed master controller are:

- £12,000
- 108 MWh
- 38 tonnes CO<sub>2</sub>

With a typical capital cost of £6,000 and lifetime energy and AIA benefits of around £121,800 at today's prices, the financial benefit of choosing an ETL listed product is over 20 times the cost. Furthermore with a potential AIA of £1,140 in year 1 plus additional energy savings, the capital cost is recovered within the first year of purchase.



© HPC Compressed Air Systems

## Did you know?

On average, master controllers can deliver energy savings of approximately 15-30% depending on system size



# Products eligible listed on the ETL:

## Refrigerated air dryers are covered by the ETL.

### Did you know?

For every 10°C drop in compressed air temperature, the moisture holding capacity of air is reduced by 50%.

### Refrigerated Air Dryers

Refrigerated dryers are used to remove the moisture present in compressed air before it is used. Drying the compressed air prevents liquid water forming downstream where it can contaminate or damage the system causing operating problems, costly maintenance, and repairs.

Drying is achieved by cooling the air so forcing any moisture present to condense. The moisture is then collected and drained from the system.

A refrigerated air dryer typically increases the energy used in the compressed air system by between 2% and 5% depending on product type and how it is controlled.

Refrigerated air dryers with energy saving controls can moderate their energy use in line with compressed air demand. As the compressed air demand falls so does the demand on the dryer. Dryers with such controls typically use 30% less energy than non-modulating products.

**Example: For a compressor with a 90kW capacity, delivering 14.25 m<sup>3</sup>/min for a total of 8,000 hours per year at full load, the potential annual savings of installing a new ETL listed refrigerated air dryer over a non-ETL listed unit are:**

- £980
- 8.8 MWh
- 3.1 tonnes CO<sub>2</sub>

**With a typical additional capital cost of £550\* and lifetime energy and AIA benefits of around £10,000 over a non-ETL listed unit at today's prices, the financial benefit of choosing an ETL listed product is over 18 times the additional cost. Furthermore with a potential AIA of £480 in year 1 plus additional energy savings, the extra capital cost is recovered within the first year of purchase.**

\*Capital cost of non-ETL and ETL listed units being £1,980 and £2,530 respectively





# Products eligible listed on the ETL:



## Desiccant air dryers are covered by the ETL.

### Desiccant Air Dryers

Desiccant air dryers are products that are specifically designed to extract water vapour from industrial compressed air systems by absorbing moisture using a desiccant material which is then, for example, regenerated by blowing air through the dryer.

Desiccant air dryers are commonly fitted to compressed air systems to prevent moisture from condensing within pipe work and equipment. They are typically utilised where compressed air is needed at higher quality or with a lower dew point than can be achieved by a refrigerated air dryer.

Desiccant air dryers available through the ETL must incorporate a dew point sensing control and must either use a regeneration method which is heatless or electrically heated (either internally or externally).

Desiccant air dryers (DAD) with energy saving controls can bring savings of 20 to 80% by ensuring they only operate when necessary or at a level that reflects moisture content.

**Example: For a compressor with a 90kW capacity, delivering 14.25 m<sup>3</sup>/min for a total of 8,000 hours per year at full load, the potential annual savings of replacing an existing desiccant air dryer with a new ETL listed one are:**

- £2,360
- 21.1 MWh
- 7.4 tonnes CO<sub>2</sub>

**With a typical additional capital cost of £550\* and lifetime energy and AIA benefits of around £23,800 over a non-ETL listed unit at today's prices, the financial benefit of choosing an ETL listed product is over 43 times the additional cost. Furthermore with a potential AIA of approximately £480 in year 1 plus additional energy savings, the extra capital cost is recovered within the first year of purchase.**

\*Capital cost of non-ETL and ETL listed units being £1,980 and £2,530 respectively



## Where can I find more information?

### Energy Technology List



For information about the ETL please visit: <https://www.gov.uk/guidance/energy-technology-list> and see our [Information for Purchasers](#) factsheet. Or contact the ETL Help Line on 0300 330 0657; email [ETLQuestions@carbontrust.com](mailto:ETLQuestions@carbontrust.com)

For more information on the ETL:

To search for a product on the ETL please visit:  
[https://etl.beis.gov.uk/engetl/fox/live/ETL\\_PUBLIC\\_PRODUCT\\_SEARCH](https://etl.beis.gov.uk/engetl/fox/live/ETL_PUBLIC_PRODUCT_SEARCH)

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