

The Armfield advanced renewable energies range is a specialised learning system for the technical education in universities and vocational training centres.

The kits cover Photovoltaic and Wind Energy generation, Fuel Cell and Battery Technology, Thermal Energy and the construction of a controllable Smart Grid on a laboratory scale.



Supplied in an aluminium case

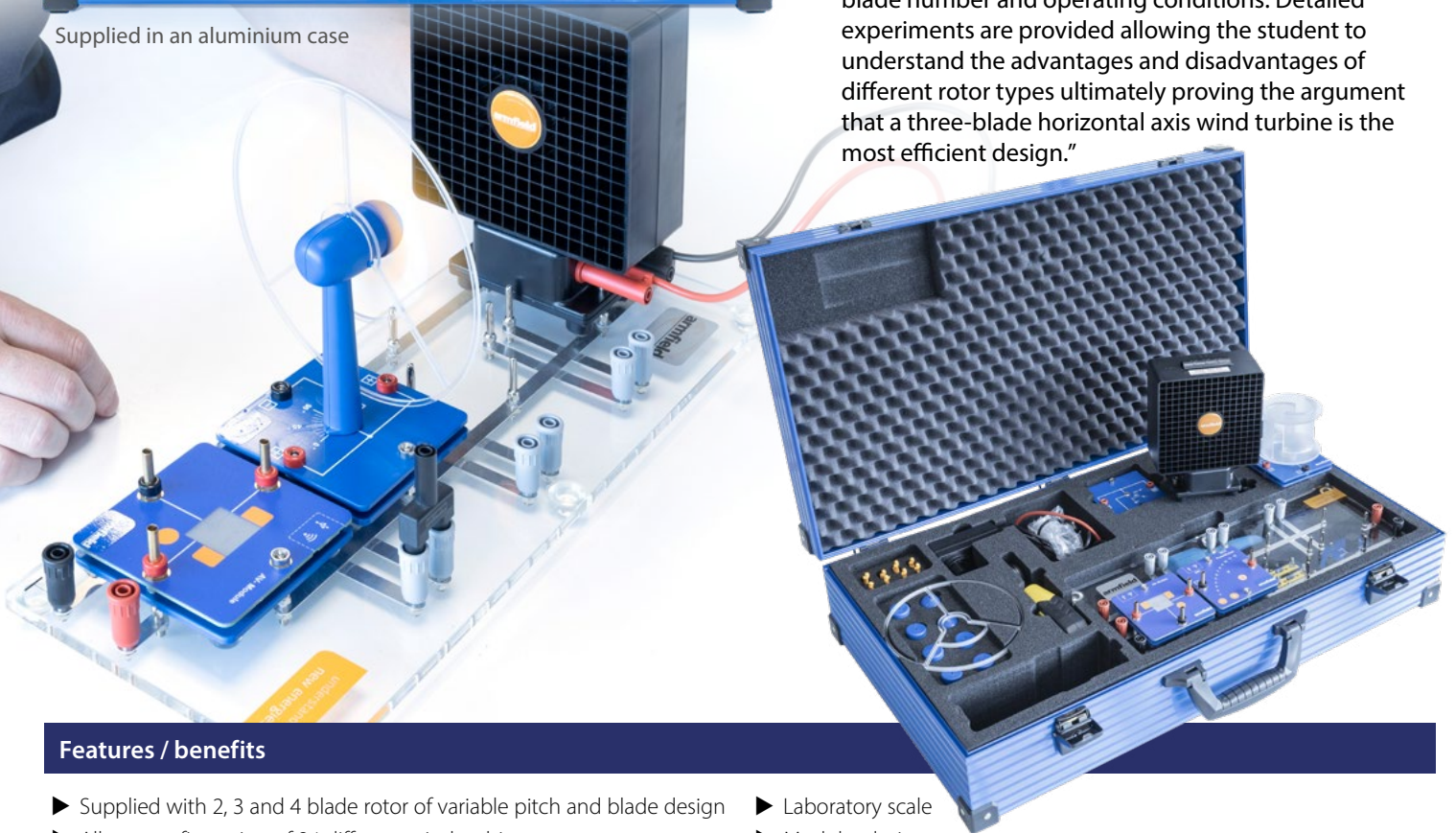
PROVIDES A WIDE RANGE OF EXPERIMENTS INCLUDING THE PHYSICAL FUNDAMENTALS OF WIND ENERGY UTILISATION AND THE PRACTICAL APPLICATION OF THIS TECHNOLOGY ON A LABORATORY SCALE

“The RE12 Advanced Wind Energy system provides students with a self-contained modular system, covering the physical fundamentals of wind energy productions, covering wind power fundamentals, controlling a typical wind tunnel and different rotor types.

Using the system students study wind turbine characteristics, turbine performance under load and turbine performance at different wind conditions.

This is achieved by practice experimentation designed to analyse the power conversion processes at a wind turbine, characterising and rating of a typical wind turbine, investigating the influence of wind conditions and loads on turbine performance and determining optimized working conditions.

The system is supplied with multiple rotors allowing student to investigate Savonius rotors, blade shape, blade number and operating conditions. Detailed experiments are provided allowing the student to understand the advantages and disadvantages of different rotor types ultimately proving the argument that a three-blade horizontal axis wind turbine is the most efficient design.”



Features / benefits

- ▶ Supplied with 2, 3 and 4 blade rotor of variable pitch and blade design
- ▶ Allows configuration of 24 different wind turbines
- ▶ Includes Savonius rotor
- ▶ Laboratory scale
- ▶ Modular design
- ▶ Supplied in a self contained aluminium case
- ▶ Includes in-depth manual and predefined experiments

Experimental content

Basic electronic experiments

- ▶ Setup of a simple circuit
- ▶ Ohm's law
- ▶ Series connection of ohmic resistances
- ▶ Parallel connection of ohmic resistances
- ▶ Start-up and idling behaviour of a motor

Basic wind experiments

- ▶ Examine the wind speed behind the rotor
- ▶ Energy balance sheet and efficiency of a wind turbine
- ▶ Rotational speed and speed ratio of a wind turbine
- ▶ Change the turbine voltage by connecting a consumer

Influence of a consumer

- ▶ Characteristic curves and rotational speed of a wind turbine
- ▶ Influence of the wind speed
- ▶ Voltage of a wind turbine dependent on the wind speed
- ▶ Rotational speed and output dependent on the wind speed
- ▶ Voltage dependent on the wind direction
- ▶ Influence of the wind direction
- ▶ Rotational speed and output dependent on the wind direction
- ▶ Influence of the generator model
- ▶ Voltage dependent on the rotor model
- ▶ Rotational speed and output dependent on the rotor model
- ▶ Influence of the rotor blade shape
- ▶ Voltage dependent on the rotor blade shape
- ▶ Rotational speed and output dependent on the rotor blade shape
- ▶ Influence of the number of rotor blades
- ▶ Voltage dependent on the number of blades
- ▶ Rotational speed and output dependent on the number of blades
- ▶ Voltage dependent on the rotor blade pitch
- ▶ Influence of the rotor blade pitch dependent on the rotor blade pitch
- ▶ Start-up speed of a wind turbine dependent on the rotor blade pitch
- ▶ Rotational speed and output dependent on the rotor blade pitch

Requirements

Scale



1Ph



Electrical supply: 110-230V AC 50-60Hz

- ▶ Level and stable work surface

Overall dimensions

Tray

Length	0.640m
Width	0.165m
Height	0.370m

Packed and crated shipping specifications

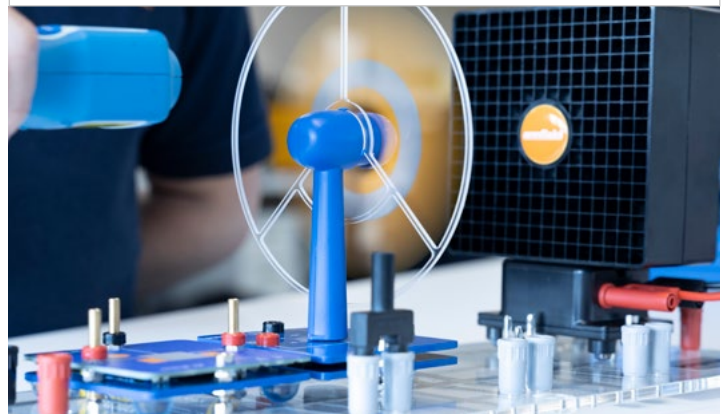
Volume	0.038m ³
Gross weight	6Kg

Related curriculums

- ▶ Electrical Engineering
- ▶ Renewable Energies

Ordering specification

- ▶ 1 x Wind turbine module Pro
- ▶ 1 x Potentiometer module Pro
- ▶ 1 x Savonius rotor module Pro
- ▶ 1 x Wind rotor set
- ▶ 1 x Base unit Professional
- ▶ 1 x Wind generator
- ▶ 1 x Anemometer Pro
- ▶ 2 x Resistor module (triple) Pro
- ▶ 3 x Resistor plug element 100 Ohm
- ▶ 2 x Resistor plug element 10 Ohm
- ▶ 1 x Resistor plug element 33 Ohm
- ▶ 1 x AV module
- ▶ 1 x Power module
- ▶ 1 x Propeller
- ▶ 1 x Safety test lead, 50cm, red
- ▶ 1 x Safety test lead, 50cm, black
- ▶ 1 x Safety test lead, 25cm, red
- ▶ 1 x Safety test lead, 25cm, black
- ▶ 3 x Safety short-circuit plug, with mid socket
- ▶ 1 x Rotational-speed sensor
- ▶ 1 x Aluminium case "Wind-Professional"



Other products in the advanced renewable energies range

- ▶ **RE10:** Advanced Photovoltaic Energy
- ▶ **RE14:** Advanced Fuel Cell Technology
- ▶ **RE16:** Advanced Thermal Energy
- ▶ **RE18:** Advanced Smart Grid Technology
- ▶ **RE24:** Advanced Battery Technology

Operational conditions

- ▶ Storage Temperature: -10°C to +70°C
- ▶ Operating temperature range: +10°C to +50°C
- ▶ Operating relative humidity range: 0 to 95%, non-condensing

Ordering codes

- ▶ **RE12:** Advanced Wind Energy

Armfield standard warranty applies with this product

Knowledge base

- > 28 years expertise in research & development technology
- > 50 years providing engaging engineering teaching equipment

Benefit from our experience, just call or email to discuss your laboratory needs, latest project or application.

An ISO 9001:2015 Company



Products CE certified

armfield.co.uk

Aftercare

Installation
Commissioning
Training
Service and maintenance
Support: armfieldassist.com