delta-mobrey

Renewable Energy

Delta Mobrey - working with renewable energy

www.delta-mobrey.com

Delta Mobrey - more than just a name, it's a heritage!

As experts within the field of process instrumentation we have a range of products and services designed and approved for the renewable energy market. All of which can be specifically customised to meet the exact requirements of your plant. Our staff are experts in their field and are available to provide consultancy and assistance where needed.

Our expertise is garnered from over 100 years of experience within process instrumentation. Whilst our name, Delta Mobrey may be new to the renewable energy market, our heritage certainly isn't. Reflecting back, we have been known as Bestobell Mobrey or Rosemount Measurement, part of the Emerson Group, before merging product ranges.

The Mobrey range of products was assigned to Delta Controls in 2019. As part of the merger and to reflect the product brands we became Delta Mobrey in 2019. So whilst the company name is new, the industry expertise and understanding isn't. Our product range is enhanced as is our level of expertise and customer experience.

A Century of Process Solutions

1904 Ronald Trist patented the "SEA Ring" gland packing ring for boiler house steam engines.

1928 Founding of Ronald Trist Co. Ltd.

1947 Chief Engineer Leonard Bomyer develops a magnetic level switch, named the Mobrey (an anagram of his name).

1950 Delta Controls founded with the development of Pressure & Temperature switches.

1956 Delta Controls chosen for first commercial nuclear reactor.

1975 Development of classified and non-classified nuclear instrumentation.

1976 Acquisition of Meterflow and Sparling flow meters.

1980 Smart HART pressure transmitters developed.

1988 Meggit plc acquires KDG Instruments Ltd.

1990 KDG Mobrey formed.

1991 World's first Smart Ultrasonic Level Transmitter developed.

1999 Flow, Density, Viscosity, Hydrastep™ and Hydratect™ products added via acquisition by Roxboro Group.

2000 Global expansion of offices across Europe, USA, Middle East and Asia.

2005 Mobrey brand becomes part of Emerson Process Management.

2019 Delta Mobrey formed with the acquisition of Mobrey products and technologies from Emerson.

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Introduction

Reducing our dependence on fossil fuels has long been an environmental argument, we need to alter our reliance upon finite fossil fuels and slow climate change. However, it is now becoming an economic argument as more focus in terms of financial support, government grants etc is given to alternative sources of energy for industries and consumers.

Alternative energy processes can produce reasonable levels of energy with reduced environmental impact. Creative engineering has developed energy solutions that allow us to handle differing environmental concerns, ie what to do with landfill and the noxious gases emanating from such places, whilst generating electricity or environmentally friendly items specifically to burn for heat.

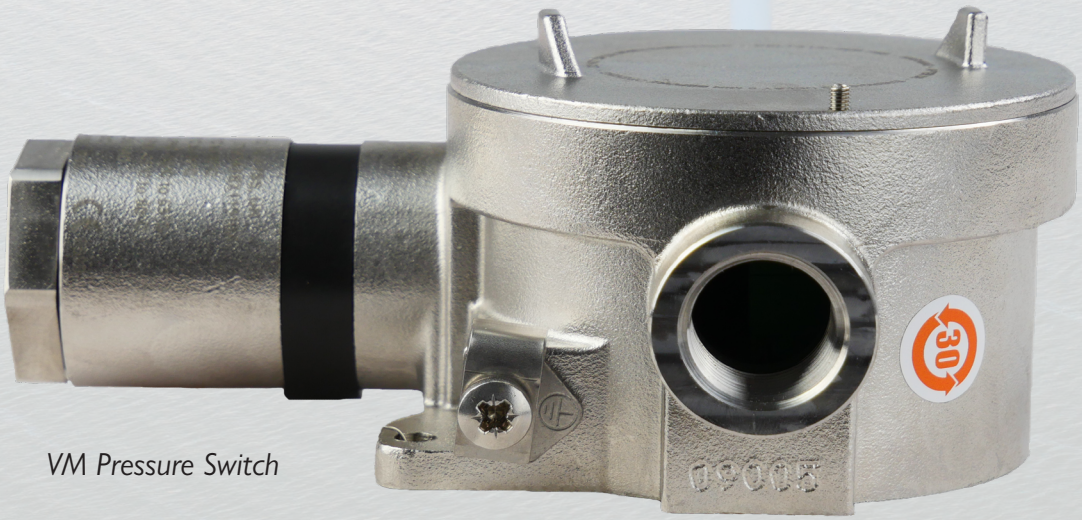
As we become less reliant on traditional energy sources we will start to depend on multiple energy types, wind, solar, hydrogen, hydro, biogas, waste to energy. These sources will create an energy matrix designed to deliver the demand for energy. Each type of energy source has different merits and some types may be more suitable than others for different geographies. As an example the Middle-East can be more reliant upon solar, whilst the USA may be more dependent upon wind.

The journey to create each energy type needs to be managed and controlled with reliable process instrumentation, so the right amount of temperature, pressure, flow or levels can be safely maintained to generate the green energy we need.

Delta Mobrey has a number of options to assist anyone working within the renewable energy sector. Our engineers can work with you to offer some bespoke fittings to ensure that the instruments needed are ideally suited for the function required.

Why Delta Mobrey

Being able to measure and control pressure, flow, level and temperature accurately, in all environments and in all industries, to ensure safety standards are continually maintained, requires precise and robust process instrumentation. Delta Mobrey has been working within this environment for over 100 years and has garnered an exceptional level of expertise which we manufacture into all of our products.



VM Pressure Switch

Differing Energy Types

Hydropower

The basic principle of hydropower is using water to drive turbines. Hydropower plants consist of two basic configurations: with dams and reservoirs, or without. Hydropower dams with a large reservoir can store water over short or long periods to meet peak demand. The facilities can also be divided into smaller dams for different purposes, such as night or day use, seasonal storage, or pumped-storage reversible plants, for both pumping and electricity generation. Hydropower without dams and reservoirs means producing at a smaller scale, typically from a facility designed to operate in a river without interfering in its flow. For this reason, many consider small-scale hydro a more environmentally-friendly option.

Bioenergy

Bioenergy use falls into two main categories: "traditional" and "modern". Traditional use refers to the combustion of biomass in such forms as wood, animal waste and traditional charcoal. Modern bioenergy technologies include liquid biofuels produced from bagasse and other plants; bio-refineries; biogas produced through anaerobic digestion of residues; wood pellet heating systems; and other technologies.

Biogass

Biogas plays a significant role within the renewable energy sector, with the particular emphasis being on the economy of biogas plants. By using tried and tested technologies, the efficiency of biogas production can be optimised. The automation and design of the measurement and analysis systems make a long-term contribution to optimum gas production in biogas plants. In order to determine the process states in the plant, there is a continuous need for information about temperatures, flows, levels, pressures and gas composition.

The correct choice of instrumentation has a great influence on the efficiency of the plant. These systems must offer reliability, longevity, and ease of operation.

Energy from biomass can take the following forms:

From plants:

Biomass process requires steam to soften and reduce the cellulose element, ie straw into a pliable matter, where enzymes can be added to liquify the substance. Once liquification has taken place the product is pumped into fermentation tanks where yeast is added to convert the now sugars to ethanol and carbon dioxide.

To manufacture such a large amount of ethanol efficiently and safely, the refinery would require a variety of highly accurate flowmeters to measure the flow throughout the biomass-to-ethanol conversion process. The chosen flowmeters would need to be reliable and durable enough to withstand corrosive media, high pressures and potentially explosive conditions. Ideally, they would also be capable of integration with a control network to optimise both process and cost efficiency.

The solids resulting from the distillation process are then dried and pelletised to be used as solid biofuel.

From Municipal solid waste landfills and livestock manure

The biogas is a product from the anaerobic decomposition of thermochemical conversion of biomass. The biogas can be burnt directly as a fuel or treated to removed the CO2 and other gases for use just like natural gas. Treated biogas may be called *renewable natural gas* or *biomethane*.

Anaerobic decomposition of biomass occurs when anaerobic bacteria—bacteria that live without the presence of oxygen—eat and break down, or digest, biomass and produce biogas. Biogas forms in and can be collected from municipal solid waste landfills and livestock manure holding ponds. Biogas can also be produced under controlled conditions in special tanks called anaerobic digesters. The material remaining after anaerobic digestion is complete and is called digestate, which is rich in nutrients and can be used as a fertiliser.

Many municipal sewage treatment plants and manufacturers such as paper mills and food processors use anaerobic digesters as part of their waste treatment processes. Some sewage treatment and industrial facilities collect and use the biogas produced in anaerobic digesters to heat the digesters, which enhances the anaerobic digestion process and destroys pathogens, and some use it to generate electricity to use at the facility or to sell.

Waste To Energy

A waste-to-energy facility may generate a range of energy outputs: electricity, district heating, steam for industrial processes, desalinated seawater or district cooling. In this way, residual waste – ie waste that cannot be recycled in an economic or environmentally beneficial way – can become a resource by turning it into energy for the benefit of people, businesses, countries and the environment.

A waste-to-energy facility can therefore be a valuable local source of secure, stable and climate-friendly energy. It will substitute fossil fuels and contribute to national energy self-sufficiency and will in many cases fully eliminate the need for landfilling.

Waste-to-Energy simply put is where waste is burnt at high temperatures, this is used to heat water within an industrial boiler, the steam created is then used to turn turbines to create electricity for power. This birds eye view sounds simple enough but like most industrial processes detailed planning is needed to ensure the integrity of the process, the safety of staff and the community.

A number of pre-incineration processes, such as the removal of ferrous metals, to go for recycling, has reduced the amount of pollutants emitted but has made the economic viability of this process more questionable. New incinerators have therefore, been created to meet the stricter regulations on pollution allowing for the continued growth of this industry. Improved process methodologies and newer technologies are allowing for further development of this energy option helping to achieve economic viability.

Hydrogen

Hydrogen has been used in multiple industries to produce a diverse range of products; fertilisers, commodities, such as plastics and used to grind metals. And now with the focus on green energy Hydrogen can become an intrinsic part of the energy matrix. It's versatility makes it a useful alternative energy source should there be a drop in other green energy sources, ie wind or solar. Its ability to be stored ensures it can fill the energy delta, thereby sustaining the levels of energy required.

Depending upon how the energy is obtained Hydrogen has different names:

> **Grey:** This is what most of the world's hydrogen currently is, produced from natural gas or methane via steam reforming
> **Blue:** during the steam reforming process, a high proportion of the carbon generate is captured and stored underground, this is low carbon hydrogen
> **Green:** made using electricity from renewable sources to split water molecules into hydrogen and oxygen – this is carbon free hydrogen and is viewed as the most environmentally friendly.

Hydrogen, one of the simplest elements in the periodic table, can permeate metals as the ions are so small. This does mean that any instrumentation in contact with hydrogen does need to be made of very specific materials to maintain the integrity and accuracy of any instrument. At Delta Mobrey we have done a fair amount of research into this and have several options available to customers.

Wind

Wind power is one of the fastest-growing renewable energy technologies. Usage is on the rise worldwide, in part because costs are falling. Wind is used to produce electricity using the kinetic energy created by air in motion. This is transformed into electrical energy using wind turbines or wind energy conversion systems. Wind first hits a turbine's blades, causing them to rotate and turn the turbine connected to them.

That changes the kinetic energy to rotational energy, by moving a shaft which is connected to a generator, and thereby producing electrical energy through electromagnetism.

The amount of power that can be harvested from wind depends on the size of the turbine and the length of its blades. The output is proportional to the dimensions of the rotor and to the cube of the wind speed. Theoretically, when wind speed doubles, wind power potential increases by a factor of eight.

Solar Energy

Electricity is generated in a couple of ways:

Solar PV
Solar technologies convert sunlight into electrical energy either through photovoltaic (PV) panels or through mirrors that concentrate solar radiation. It is the reaction of the silicon within the panels that generate the electricity. This energy can be used to generate electricity or be stored in batteries or thermal storage.

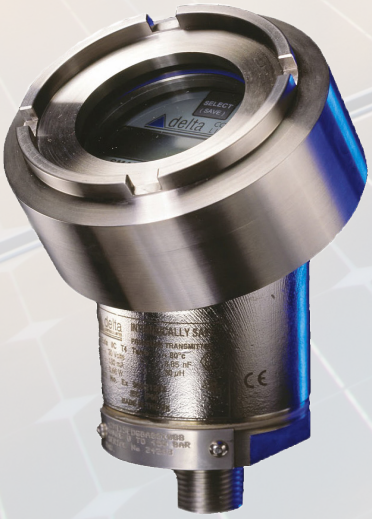
Concentrated Solar Power
Concentrated solar power (CSP) uses the concentrated solar energy to heat up a heat transfer fluid (HTF). This thermal energy is converted into electricity through a thermodynamic cycle.

CSP has become more common place over the last two decades, especially in countries with high direct normal irradiance (DNI) levels (>2000 kWh/m2 /year). The conversion of solar energy into thermal heat through CSP enables the use of thermal energy storage (TES) in solar power plants.

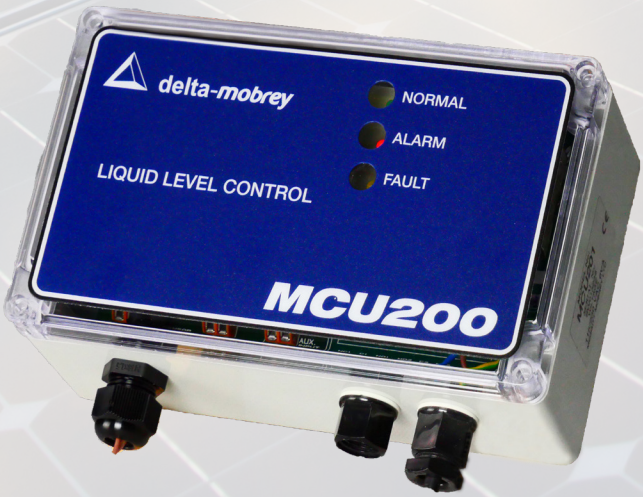
This offers CSP a unique advantage as a renewable energy source, as it can incorporate storage. CSP can be used as a stand-alone process or can be used in conjunction with other green energy systems in a synergistic relationship, ie can provide the levels needed when alternative methods of energy production slow, ie wind.

Below is a quick reference guide of renewable industries and the most suitable products in the Delta Mobrey range:

Product Type/Industry	Ultrasonic/ Levels	Hydrastep/ Hydratect	Gap Sensors	Pressure Transmitters	Differential Pressure Transmitter	Temperature Transmitters	Sensors
Solar, CSR only	DMSP			D21 – SMART, D22 - Analogue	D31 – SMART, D32 Analogue	DPT2000 SMART	TSCS temperature sensor
Hydrogen	DMSP, submergible type pressure transmitters		MSM/MCU gap sensor	D21 SMART PT	D21 SMART PT	D72 SMART TT, DPT2000 SMART TT with sensor	TSCS temperature sensor
Hydro	DMSP ultrasonic level measurement, DMSP ultrasonic level measurement	Hydrostep	MSM/MCU gap sensor	D21 SMART PT	D31 SMART DPT	D72 SMART TT	TSCS Skin point temperature sensor
Biogas	DMSP, submergible type pressure transmitters	Hydrostep	MSM/MCU gap sensor	D21 SMART, D22 Analogue,	D31SMART, D32 Analogue	DPT 2000, D72 SMART	TSCS Skin point temperature sensor
Waste-to-Energy	DMSP, submergible type MLT100 SMART displacer LT, MSM 400	Hydrostep, Hydrotect	MSM/MCU gap sensor	D21 SMART, D22 Analogue,	D31SMART, D32 Analogue	DPT 2000. D72 SMART	TSCS Skin point temperature sensor



2HT Transmitter



MCU200 Controller

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Delta Mobrey has a worldwide network of trained and fully supported representatives in over 50 countries.

For more information...

Delta Mobrey Ltd. has a global network of global offices and authorised partners. For more information, technical support or queries, please contact your regional Delta Mobrey office, or visit our website.

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