





Wema – increasing your performance and reliability

Since Wema was established in 1986, we have delivered quality tank sensors in increasing numbers to a growing list of industries and markets. Our yearly production surpasses one million units, and many of the earliest manufactured units are still in service. Over the years we have gained a global reputation for providing the most reliable sensors in each of our markets.

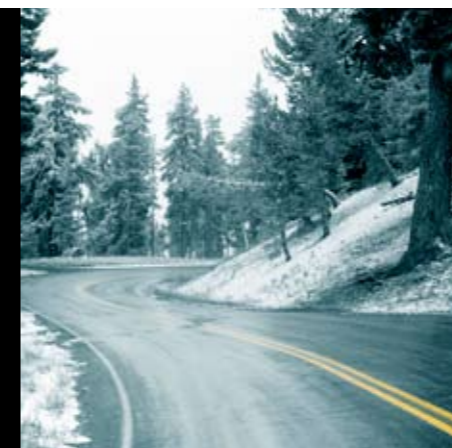
Today our market orientation is four-fold: the automotive, marine, agricultural and construction industries. Wema supplies many types of liquid level sensors, and has a product range that also includes AdBlue quality sensors, temperature and pressure sensors, gauges and smoke detectors.

As supplier to these industries, Wema satisfies all relevant international standards. Wema's strategy is to seek continuous improvement of quality and reliability, surpassing any requirement by a wide margin.

Wema does not believe in a "take it or leave it" approach. In practice all of the products we provide are customised solutions for specific needs. Our company has an effective timeframe for development-to-market, and we have a wide range of testing facilities to ensure product quality. Our perspective in all deliveries to our customers is always long-term. We have the know-how, the solutions, and the flexibility to meet your changing needs.

Wema is far more than a product supplier – we are your technology partner.

Our perspective is long term, while the basis of Wema's service philosophy is to provide tailored solutions for our customers as quickly as possible.





Automotive

Scandinavian roads are notorious for their variable quality, and vibrations combined with extreme temperature variations expose sensors to considerable stress. Should a sensor fail, there is imminent risk of the truck stopping – it's that simple. That is why most European truck manufacturer choose to install Wema sensors.

Wema's fuel and AdBlue sensors for commercial vehicles have a number of characteristic features. Designed to ensure trouble-free function even in extreme Nordic climates, they are the most reliable on the market. With a minimum of moving parts and carefully selected materials, they are hardly vulnerable to wear and tear. Moreover, all Wema products are designed for easy and cost-effective installation.

Rather than having to deal with many components from various producers, a growing number of OEMs choose the integrated level measurement systems offered by Wema. In addition to straight-forward sensors that indicate high and low levels, we offer multifunction systems that combine sensors with suction and return pipes for engine and heater, temperature sensors and various filter solutions.

Europe has been the legislative leader in anti-pollution measures in the automotive sector. As Europe's leading manufacturer of AdBlue level sensors, Wema is now making an important contribution to the SCR technology that promises to greatly reduce NOx from truck exhausts.

The bottom line is simple – you can rely on Wema to make a difference.

More than two-thirds of the new trucks built for Scandinavian roads are equipped with Wema fuel sensors. This is your best proof of reliability!





Marine

More than twenty years ago, Wema started manufacturing fuel and water sensors for leisure boats. Since then, our track record has proved unbeatable. That is why many leading producers of boats and boat engines around the world install Wema fuel sensors as standard equipment – as part of *their* focus on quality.

Wema is known for tailoring its marine fuel sensors to the precise specifications of boat producers and shipyards, regardless of how large (or small) a production series you might require. Our sensors can be made compatible with any tank form, hull size and mounting hole pattern. They are easy to mount and just as easy to service.

To ensure a long product life in demanding marine environments, Wema uses stainless steel and non-corrosive materials. In addition to fuel sensors, single gauges and multi-tank panels, we also provide bilge pump switches and leakage alarms, all manufactured in accordance with the strictest specifications.

As a result, key components from Wema sail the seven seas in boats and vessels of every size – and we are indeed represented world-wide.

Wema has a reputation for working closely with its customers. In other words, if you do not see the product your company requires – contact us, and we will manufacture it to your specifications.

This versatility is just one of our key strengths. Fast delivery and service you can count on are two more.

In exotically beautiful – but at times demanding – Norwegian waters, you will find that most boat owners rely on sensors from Wema. Good examples to follow!





Agriculture and Construction

In the construction industries, equipment has to function reliably, time and again.

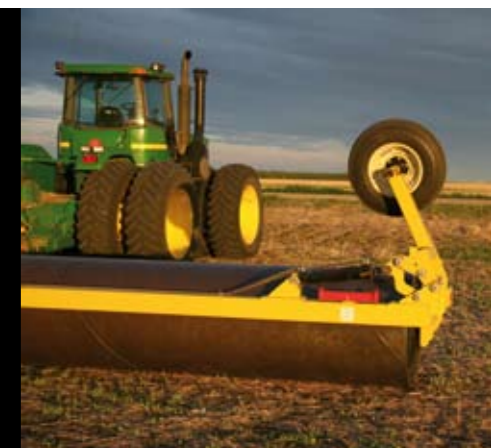
The construction industry poses a very particular set of challenges not just to equipment – but in fact to every essential component. There is an astonishing range of machinery tailored to particular tasks, from lightweight and readily manoeuvrable vehicles to extreme earthmovers. Vibrations from powerful engines and rough off-road surfaces, and extreme fluctuations in temperature and humidity, inflict punishment day after day.

That is why Wema offers a comprehensive range of sensors that is tailored to the demands of the situation. They are all thoroughly tested for performance and quality. With a minimum of mechanical parts, they are designed to take a beating.

In agriculture, timing is critical when tilling the soil, caring for and harvesting crops, and transporting the produce to market. That is why *reliability* is a must – in both industries.

That is the key: The operator will never give a second thought to the fact that he is relying on Wema components every single second of his working day. Year after year.

Timing is critical in agriculture and construction industries. We design our products so that machine operators only have to concentrate on getting their job done.



AdBlue Quality sensor



AdBlue Quality sensor

Designed to meet global emission legislations

Global emission legislations for diesel engines are becoming increasingly stringent. While the exhaust gas composition requirements for prior iterations of emission legislation could be met with improvements in the engine's combustion process, the next issue of European, North American and Japanese emission limits will require more rigorous measures, mainly employment of selective catalytic reduction (SCR) technology.

Wema, being the world wide leading manufacturer of AdBlue sensors, supplying 95% of all European SCR equipped trucks, makes an important contribution to efficient SCR operation. All sensors are custom made in terms of length, dimensions of tubes, thawing capabilities, filter and electrical characteristics and can, furthermore be integrated with a Wema urea quality sensor.

The urea quality sensor addresses quality control concerns by ensuring a specific quality of urea is delivered into the exhaust gas stream. The introduction of a urea quality sensor into the SCR system also reduces the risk of tampering or accidental mis-filling and helps ensure compliance, thus satisfying concerns of users and legislators alike. This contributes to the overall success of SCR as a NOx reduction technology.

One single unit- reducing for cost efficiency :

Interfacing the AdBlue quality sensor with a standard Wema AdBlue sensor, allows us to offer our customer a complete system, interfaced into one unit with features such as:

- High and low level indicator
- Suction and return of AdBlue
- Heating tubes for melting of frozen AdBlue
- Temperature
- Filter
- Air vent
- AdBlue quality measurements
- CANBus output for meeting On- Board Diagnostic (OBD) requirements



Why use an urea quality sensor?

The benefits derived from Wema Urea quality sensor can be described from three aspects:

- Safety aspect
- Truck operator aspect
- Truck manufacturer aspect

Common feature for these aspects has proven to be:

- Diesel fuel is accidentally put on the AdBlue tank.
- Salt water is deliberately put on the AdBlue tank
- Truck driver is topping up the AdBlue tank with water
- Canisters are refilled and reused and AdBlue decanted to improper containers
- Rogue suppliers producing non-DIN specification AdBlue

Actually, industry sources indicate that up to 50% of truck drivers in certain European countries do not use AdBlue on their SCR trucks.

The consequences can be summarized as follows:

- Explosions and fire in catalyst due to diesel in AdBlue tank
- Engine damage due to diesel in AdBlue tank

- SCR ring gasket damages due to diesel in AdBlue tank
- Clogging of catalyst due to diesel or non compliance AdBlue
- Non compliance AdBlue will not meet emission legislations
- Non compliance AdBlue can incur costly torque penalties
- Non compliance AdBlue can incur financial penalties from authorities
- Non compliance AdBlue can cause warranty claims
- Running with poor quality AdBlue or diluted AdBlue may cause transport companies to suffer damage to their reputation for corporate responsibility

The Urea Quality Sensor provides the following benefits:

- It detects immediately if diesel fuel is present in the AdBlue tank
- It can alarm the AdBlue dozing pump, enabling it to stop injection of diesel and thereby preventing hazardous situations.
- It will immediately detect any non-compliance AdBlue
- It can instruct dozing unit to stop injection and thereby preventing any non compliance AdBlue from entering the catalyst

- It will report by CanBus to OBD any discrepancy from standard settings.
- It will assist in roadside checks or during annual testing by reporting the use of any non-compliance AdBlue





Wema – building the future today

Wema has grown to be Europe's largest provider of sensors and related products, thanks to systematic innovation and an uncompromising focus on quality. Increasing demand for our reliable, cutting-edge technology is leading us to increase our production capacity significantly.

For the last few years, Wema has been developing components to meet new and stricter European anti-pollution legislation. The utilisation of SCR and AdBlue technology will achieve considerable reductions of NOx in truck exhausts. Some of this legislation has already been implemented – and Wema is firmly established as a leading manufacturer of AdBlue level sensors.

An additional priority in this phase of our expansion is to further improve our logistics in our various geographical markets in collaboration with our customers. The objective is to further reduce delivery times and save on total transportation costs.

Our search for ever better solutions continues across our full product range. Wema nurtures a close partnership with Christian Michelsen Research, one of

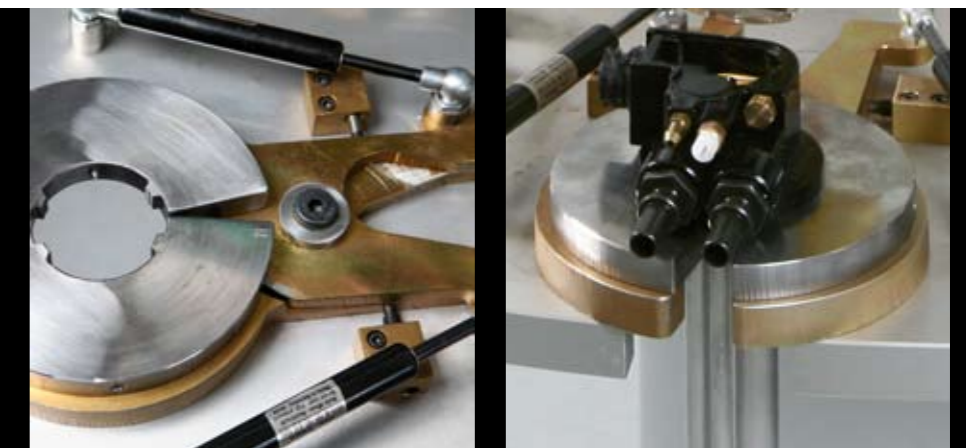
Europe's foremost industrial research communities, as well as leading laboratories in other countries.

Nevertheless, the most important element of Wema's strategy is our close cooperation with our customers. These include every single OEM in Europe – and a growing number in other parts of the world.

Wema is engaged in a close dialogue with its clients, exchanging views on technological and legislative challenges, and proposing solutions. We are technology partner and consultant; in some cases our involvement is even requested in the early stages of product design. As anti-pollution measures become ever stricter, these pro-active strategies are a competitive must. This is corporate interplay at its best.

For our clients and for us.

Wema is proud to contribute to a technology that promises cleaner air now, for future generations of mankind and all our fellow creatures.

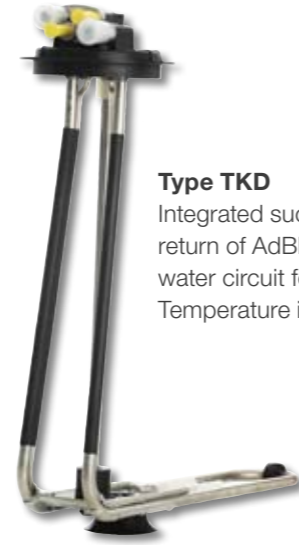




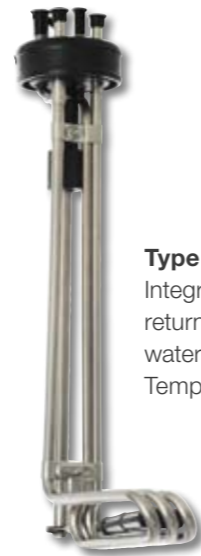
Type TZLQ
Integrated suction and return of AdBlue. Coolant water circuit for heating. Temperature indication. Including quality measurement.



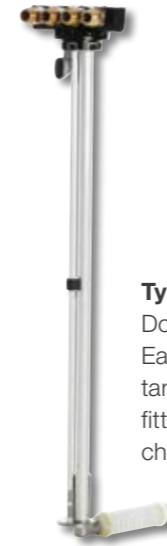
Type TV3S
Integrated suction and return of AdBlue. Coolant water circuit for heating. Temperature indication.



Type TKD
Integrated suction and return of AdBlue. Coolant water circuit for heating. Temperature indication.



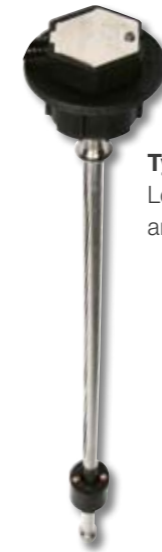
Type AHM
Integrated suction and return of AdBlue. Coolant water circuit for heating. Temperature indication.



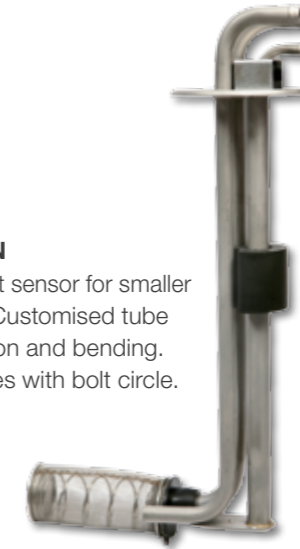
Type TQ2
Double suction and return. Easily adapted to different tank shapes. Customised fittings. All lengths and characteristics available.



Type TNB
Low cost sensor for smaller trucks. Customised tube dimension and bending. Standard bayonet.



Type TU
Low cost sensor with level- and temperature indication.



Type TN
Low cost sensor for smaller trucks. Customised tube dimension and bending. Five holes with bolt circle.



Type TX3
Easily adapted to different tank shapes. Customised fittings. All lengths and characteristics available. Optional with heating.

AdBlue level sensors

Custom made in terms of:

- filter and filter position
- tube dimensions
- ohm characteristics
- cable length

Fuel level sensors

- suction and return pipes connected to the engine fuel pump
- suction and return pipes connected to the parking heater
- fuel filter
- tank ventilation



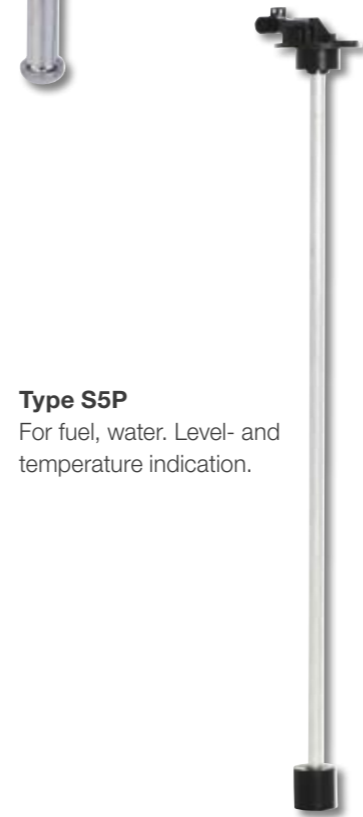
Type S5
For fuel, water and AdBlue.
Level- and temperature
indication.



Type S3
For fuel, water and AdBlue.
Level- and temperature
indication.



Type SD
Damped fuel and water sensor.



Type S5P
For fuel, water. Level- and
temperature indication.



Gauges
Wema manufactures a wide
range of quality gauges for
level- and engine monitoring.
Gauges are available in black
and white.



Smoke detector
For trucks, caravans and
boats.



Multipurpose sensors

- for various tank shapes and dimensions
- customised filter solutions
- all lengths and characteristics available

Various products

- Other products available:
- Oil temperature sensor
 - Water temperature sensor
 - oil pressure sensor
 - bilge pump switch
 - holding tank gauge

Wema – your tool
to stay within



www.wema.no