



LEVELMEASUREMENT



ROAD
Indicating technology and sensors

Product Overview
for Applications
in Liquids



Performing together to create high quality solutions

Level Sensors and Quality Sensors at the Highest Level

Reliable, precise and economical, this is how the main characteristics of the ROAD sensors can be accurately described. This is especially true for our sensors and switches for measuring and monitoring liquids.

As a recognized technology and development partner in the automotive, aerospace, marine and industrial applications sectors, we develop and manufacture future-proof level sensors for a wide range of applications. ROAD offers its customers the right solution, either from our extensive standard portfolio or as a customer-specific solution precisely tailored to your application. In any case, ROAD level sensors meet international standards as well as other industry standards from leading global OEMs.

Application examples for ROAD sensor technology at the highest level



Our claim to meet or even exceed internationally valid quality standards forms the basis for a demanding level measurement. Decades of experience, extraordinary engineering services and close cooperation with our customers, especially in development projects, guarantee the high utility value of our sensors.

The right technology for your application is the key to success. ROAD has a selection of patented technologies for level and quality measurement of liquids. In addition to the applied technology, the medium to be measured is another decision-making feature for the constructive execution of the sensor. Here we distinguish between sensors for use in the fields of fuels, oils, water, chemical or biological fluids as well as in the special application of our sensors in exhaust aftertreatment with AdBlue®.

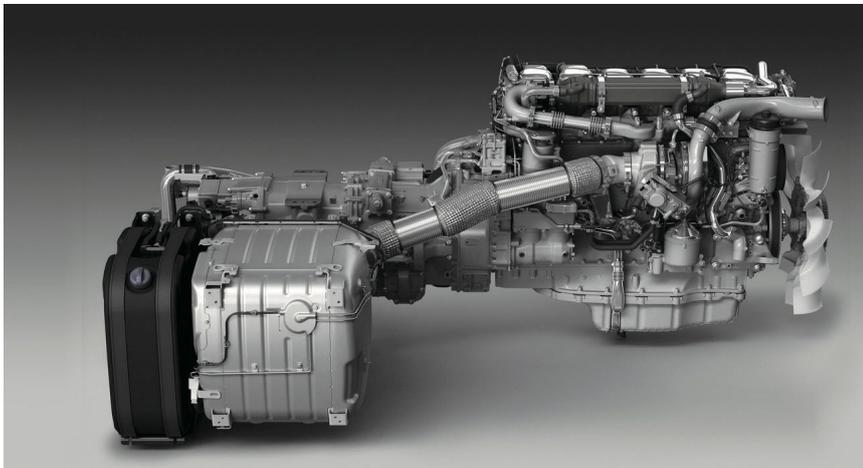


Content

	Solutions for exhaust gas aftertreatment AdBlue® Sensors	04
	AdBlue® Sensors	05 - 08
	U-Shaped AdBlue® Sensors	
	L-Shaped AdBlue® Sensors	
	S-Shaped AdBlue® Sensors	
	AdBlue® Sensors with Integrated Valve	
	AdBlue® Sensors with different Mounting Options	
	AdBlue® Sensors with Rubber Head	
	AdBlue® Quality Sensors	
	AdBlue® Sensors without Heating Function	
	Single-tube AdBlue® Sensors	
	AdBlue® Tanks	09 - 10
	AdBlue® Accessories	10
	AdBlue® Tank Caps	
	AdBlue® Filler Neck Accessories	
	Level Sensors for Fuels, Oils and Water	11 - 16
	Multifunctional Fuel Sensors TFA	
	Level Sensors Series RG and RR with Suction/Return	
	Level Sensors Series RE	
	Level Sensors Series RF	
	Flange Variants	
	High Resolution Capacitive Level Sensors KTS	
	Multifunctional Fuel Sensors TFA with Heating Element	
	Mechanical Level Indicators	
	Laboratory Validation	17 - 18
	Manufacturing	19 - 20
	Notes	21 - 22

Solutions for exhaust gas aftertreatment AdBlue® Sensors

The ROAD AdBlue® Sensors are mainly multifunctional sensors with the functions of level measurement, temperature monitoring, heating function at low temperatures, quality determination of the urea solution and various filter inserts. As an option, there is also the integrated signal processing for CAN bus versions and a control valve for the heating circuit (engine coolant) integrated directly on the flange. In recent years, the AdBlue® Sensors from ROAD have become versatile all-rounders in this field, thanks to their versatile applications and outstanding innovations.



AdBlue® Accessories



AdBlue® Tanks



AdBlue® Sensors



ROAD AdBlue® Sensors and tank systems comply with international regulations such as EURO IV, V and VI, EPA 2017, Tier4 Final, Stage V etc. Our products are used in combination with a wide variety of SCR systems by a large number of international engine and vehicle manufacturers. The diverse range of applications ranges from trucks, buses, stationary systems to vehicles and mobile machines in daily off-road use. Special requirements for our AdBlue® Sensors are taken into account in the product development right from the start. Our quality stands for AdBlue® Sensors that work optimally under all operating and temperature conditions.

Key Features and Benefits

- Reliable output signals over the entire temperature range
- Complete integration of the electronics in the sensor flange
- Ice pressure resistant design of all components
- Very high long-term stability of the sensor
- Additional inline filters for AdBlue® and in the heating circuit
- Switching valve for the heating circuit (coolant flow) integrated in the flange
- Interchangeable AdBlue® filters in 2D or 3D design
- Individual design in form and function according to customer requirements

U-Shaped AdBlue® Sensors

U-Shaped AdBlue® Sensors are suitable for many AdBlue® Tanks and are available in different lengths with different functions. A variety of assembly methods enable simple and quick application to the respective tank.



L-Shaped AdBlue® Sensors

L-Shaped AdBlue® Sensors were developed for vehicles and machines with large AdBlue® Tanks. The L-Shaped heating elements extend the heating range of the AdBlue® Sensors, which melts the frozen liquid over a larger area.



S-Shaped AdBlue® Sensors

If a particularly high heating output is required, our AdBlue® Sensors with spiral heating element, S-Shape, are used. We realize a particularly strong heating output in a small space. We therefore recommend the spiral AdBlue® Sensor for operation in particularly cold areas or for quick defrosting.



AdBlue® Sensors with Integrated Valve

- The switching valve for the heating circuit integrated in the sensor flange represents an absolute innovation
- Significant reduction in installation effort thanks to integrated valve
- Maintenance processes significantly more effective, the valve is always directly on the sensor
- Reduction of leakage risk, fewer number of line interfaces
- No additional consideration of installation space required



AdBlue® Sensors with different Mounting Options



SAE-Flange



SAE-Bolts



Clamping hoop



Bayonet twistlock

AdBlue® Quality Sensors TQS

The AdBlue® quality sensor TQS is integrated in the AdBlue® sensor and continuously monitors the concentration and the quality of the urea solution in the tank. The quality sensor from ROAD is based on a new, patented ultrasonic measuring method with an extraordinarily high insensitivity to air pockets. This ensures that the vehicle emissions EURO VI, Stage V and stricter emissions laws and regulations can be met.



Key Features and Benefits

- Housing made entirely of stainless steel
- Ice pressure resistant thanks to high quality materials in a special design
- High measuring accuracy, completely temperature compensated
- Excellent long-term stability of the measuring accuracy and the materials used
- Fully automated production and calibration guarantee the highest quality standards
- Fast measured value acquisition and signal output

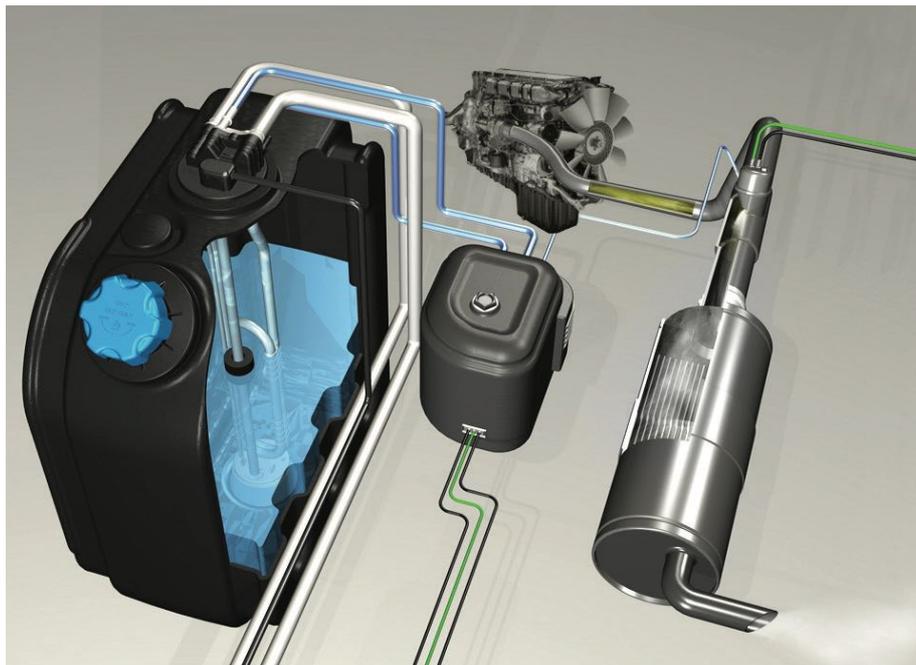
AdBlue® Sensors without Heating Function

These AdBlue® Sensors are used when the vehicle is used exclusively in special geographical areas or when the tank already has an integrated heater. All other functional features remain unchanged.



Single-tube AdBlue® Sensors

Exclusively for level measurement of certain sensors without additional functions. It is installed using a bayonet flange, the sensor length and additional switching outputs can be customized.



AdBlue® Tanks

To support „the single source strategy“ ROAD also supplies its customers with a ready-to-install complete package. The fully tested and ready-to-install assembly consists of a sensor, tank with filler neck, tank cap, ventilation and, if desired, a support bracket. For implementation, we use standard tanks and sensors as well as the option of customer-specific solutions that are tailored precisely to the installation space and the desired tank volume of the customer, including the corresponding sensor.



Our tanks use high-strength High Density Polyethylene (HDPE) or Linear Low Density Polyethylene (LLDPE). These materials are particularly dense and dimensionally stable. These engineering plastics are also long-term resistant to AdBlue® and other aggressive liquids from the automotive sector, are chemically very stable, resistant to abrasion and are characterized by high impact resistance. Our AdBlue® tanks are approved for AdBlue® according to DIN 70070 and ISO 22241/1.

We produce AdBlue® tanks with volumes from 10 to 120 liters



80L Tank



55L Tank



45L Tank



38L Tank



35L Tank



35L Tank



25L Tank



20L Tank



16L Tank



16L Tank



12L Tank



10L Tank



Key Features and Benefits

- Bayonet or screw lock
- Lockable or without lock
- Dust cap, embossed with AdBlue®
- Tank ventilation can be integrated
- Different nominal dimensions

AdBlue® Tank Caps

Our AdBlue® Tank Caps have the same material properties as our AdBlue® Tanks and are therefore the perfect addition to the consistent maintenance of our quality standards.



AdBlue® Filler Neck Accessories

The filler neck is another tank component. Our filler neck is made of plastic (also with a magnetic adapter) or steel, always to match the tank and the desired tank cap. The filler necks are available with different nominal sizes from 30mm to 100mm.



Level Sensors for Fuels, Oils and Water

With these level sensors, ROAD has an extremely wide range of products with great flexibility. This diversity arises from the combination of the technology used, the application to the tank, the signal or data interface to the vehicle or machine, and the additional functional scope of the sensor.

Multifunctional, continuously measuring level sensors are also part of the product range, as are basic sensors for level measurement or limit value monitoring. Thanks to the technically superior basic structure of our sensors, we significantly reduce the development time and the implementation of customer-specific variants.



Our current level sensors have long since performed additional tasks far beyond the actual function of level measurement. Multifunctional level sensors from ROAD are „state of the art“ across all applications. Options such as: temperature measurement, CAN bus interface, integrated ventilation valves and much more, are frequently requested functions and have already been successfully implemented thousands of times.

Level sensors TFA



The TFA series is mainly used in buses and trucks. In addition to level measurement, these sensors are equipped as standard with suction and return lines for the engine and auxiliary vehicle heating, a pressure compensation valve and various filter elements.

Key Features and Benefits

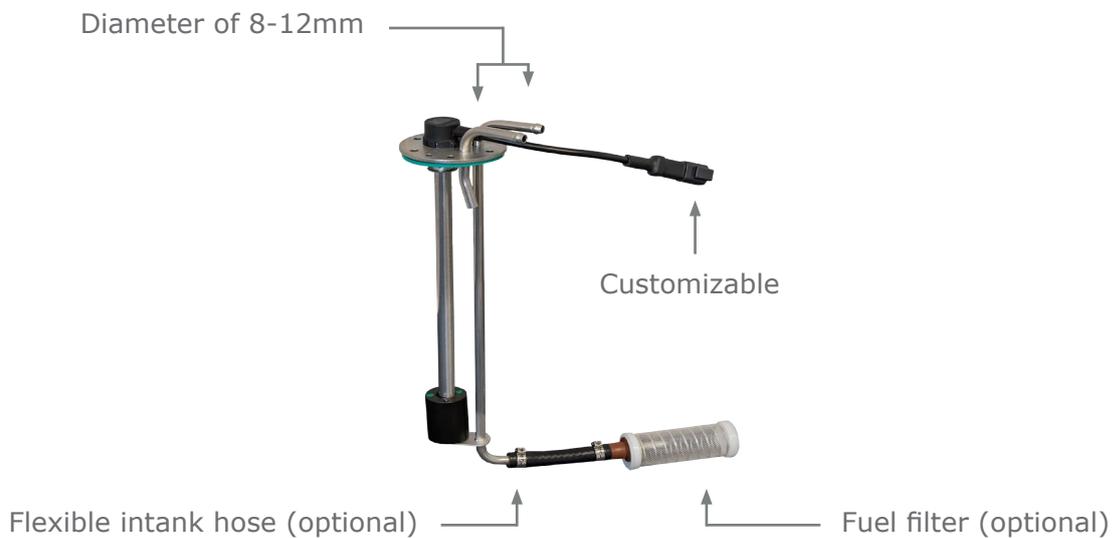
- Installation via bayonet flange (90°-rotation, twistlock)
- Integrated fuel connections for engine and auxiliary heating
- Fuel connections via fittings or quick coupling systems
- Integrated connector DIN 72585
- Filter element with a large surface
- Signal output in Ω , V, A, CAN bus
- High quality materials (die cast aluminum and pipes)

Multifunctional Fuel Sensors TFA



Level Sensors Series RG and RR with Suction/Return

Very robust sensors developed for heavy duty use and made of stainless steel. The RG / RR series is mainly used in mobile applications such as construction, agricultural and forestry machines. In addition to level measurement, these sensors have suction and return lines for the motor and, optionally, a filter element with a large surface area.



Key Features and Benefits

- Heavy duty version (stainless steel)
- Different flange diameters and hole patterns
- Flange seal attached captively
- Suction and return lines for the engine
- Protection class IP 67 and IP 6K9K
- Signal output in Ω , V, A or CAN bus
- Sensor length up to 1850mm
- Operating temperature from -40°C to $+105^{\circ}\text{C}$
- Customer-specific variants can be implemented at short notice
- Temperature measurement and switching output optional
- Effective filter element with large surface 3351mm^2 optional

Level Sensors Series RE



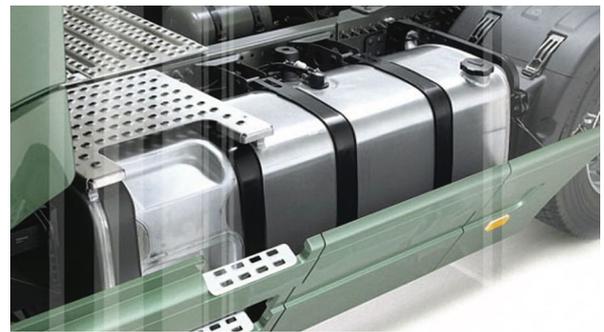
Level measurement in its basic function for many possible applications. Highly reliable, extremely robust and easy to use.

In addition to the flange variants with different hole patterns, variants with screw threads are also available for easy mounting of the sensor in the tank.

Key Features and Benefits

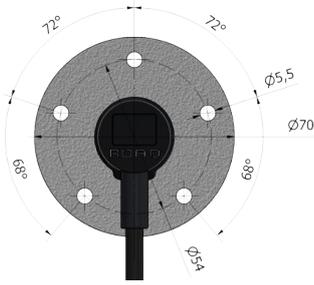
- Extremely robust, made of stainless steel or high quality aluminum
- Different flange diameters and screw threads
- Flange seals attached captively
- Protection class IP 67 and IP 6K9K
- Sensor length up to 1850mm
- Operating temperature from -40°C to +105°C
- Signal output in Ω , V, A or CAN bus
- Customer-specific variants can be implemented at short notice
- Temperature measurement and switching output optional

Level Sensors Series RF

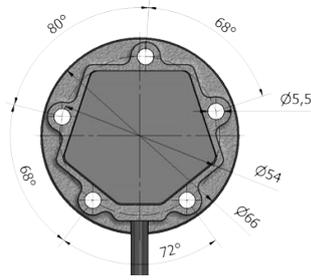


The RF series is based on the proven RE series. The two series differ structurally by a damping tube as an additional structural element for mechanical damping during extreme movement in the medium or as protection against larger floating parts in the medium.

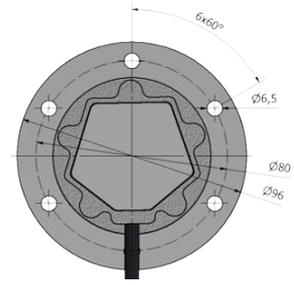
Flange Variants



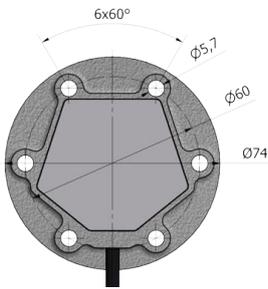
RE11 54 LKD/BCD*



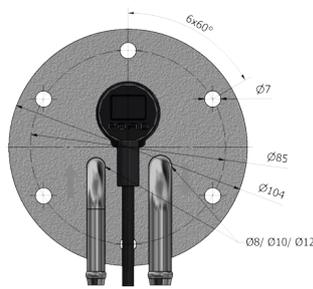
KTS 54 LKD/BCD*



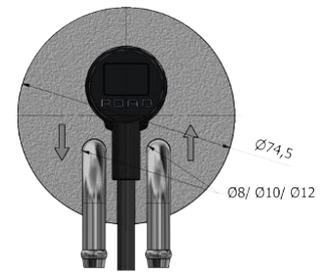
KTS 80 LKD/BCD*



KTS 60 LKD/BCD*

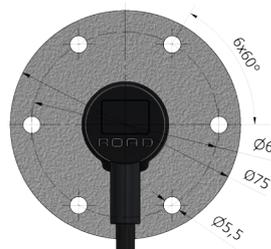
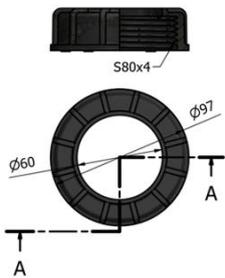


RR91 85 LKD/BCD*

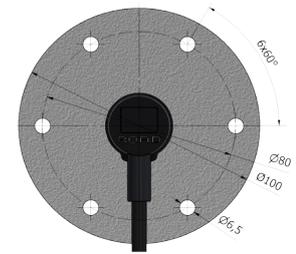


RG61 Union screw nut

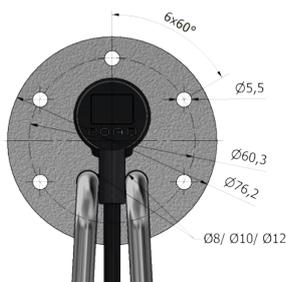
Coupling nut (PA66+GF30)
A-A (1:2)



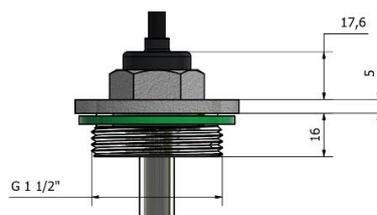
RE51 60 LKD/BCD*



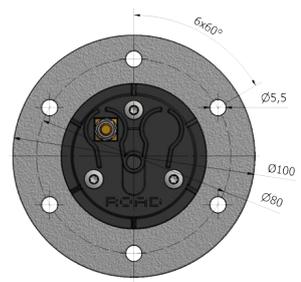
RE41 80 LKD/BCD*



RG51 60 LKD/BCD*



RE71



RA40 80 LKD/BCD*

* LKD = Lochkreisdurchmesser BCD = Bolt Circle Diameter

High Resolution Capacitive Level Sensors KTS



The KTS of the KA and KX series use a capacitive measuring method patented by ROAD without moving parts.

This modern, self-calibrating measuring method enables millimeter-precise, highly precise determination of the fill level.

Key Features and Benefits

- Made of high quality aluminum
- Different flange diameters and hole patterns
- Suction and return lines for the motor in the KX series
- Volume characteristic freely programmable
- Operating temperature from -30°C to +100°C
- Signal output in Ω , V or CAN bus
- Sensor length up to 1500mm
- Customer-specific variants can be implemented at short notice
- Temperature measurement and switching output optional

Multifunctional Fuel Sensors TFA with Heating Element



If TFA sensors are used in geographical areas with persistent cold, a heating element is the right decision in many cases. The main difference between these sensors is the type of heating elements used. Either a PTC heating element or a water heater is used.

The heating power of the PTC heating element is automatically regulated depending on the temperature. The water heater is switched on or off by a switching valve for the engine cooling circuit. The heating element is designed based on the number of heating spirals.

PTC Heating Element

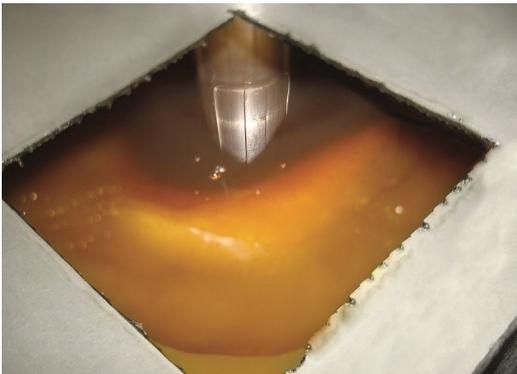
Operating voltage range: 18V - 32V
Maximum power: 200W + 20W

Mechanical Level Indicators

The purely mechanical measuring device combines the functions of level measurement and level display in a simple but highly effective manner. According to customer requirements, the switch contacts „full“ or „empty“ can be offered as an option. All required flange adapters for screwing or welding to the tank are available as standard.



These displays are used for tanks without a power supply, as an additional tank display directly on the tank or for tank containers and interchangeable tanks. Application liquids: AdBlue®, oils, water and chemical and biological additives. Measuring ranges, lengths up to 800mm.



Laboratory Validation



Environment test laboratory



Aging laboratory



Measurement center

Our modern research and testing laboratory is part of the more than 1600m² technology center.

The requirements in the automotive sector are high and continue to grow. For this reason, lifespan, reliability and functionality have been set as overriding goals from the start. Validation, environmental simulation and practical product tests already lead to an increase in the quality of our products in the development phase. We make no compromises here. This knowledge led us to found our technology center in 2007, to expand it continuously and in 2016 to transfer it to an independent test laboratory accredited by the CNAS.

The performance of our test laboratory has convinced globally active OEMs. In our internationally recognized test laboratory,



Vibration test laboratory

trained test experts ensure a well-founded implementation of all requirements. The equipment in our research and testing laboratory is state-of-the-art. Even highly complex environmental conditions can be reproduced in our laboratories.

Our test facilities include test options from standard tests such as protection classes according to IP to temperature-overlapping vibration tests of complete systems. Multi-stress analyzes allow a reliable statement about the product life.

Individual components, assemblies and series products on our test benches must constantly prove that they meet the highest safety and quality requirements. They can only be used after they have successfully passed the tests.



X-Ray laboratory

Our test conditions and test plans are based on international standards or OEM specifications from our customers.

Manufacturing



CNC machining

Modern production facilities and systems can be taken for granted. Comprehensive state-of-the-art production planning and control ensures our flexibility in production and guarantees short lead times.

With a vertical integration of over 95% in our own production, we guarantee continuous availability of all key products from raw material processing to the final assembly of the series product.



Brazing

Responsible and efficient use of resources and materials determines our actions. Our state-of-the-art, tried and tested manufacturing processes and flexible manufacturing options guarantee reliable and consistent product quality as well as punctual delivery to our customers.

Numerous positive internal and external quality audits according to worldwide standards impressively confirm the function of our quality management system across all functions of our company.

A training academy organized by internal and external specialists at the production site takes over the continuous training and further education of our employees. Qualified employees in all areas of the company are our most important asset. Our social engagement is well above average and we take our voluntary social benefits for our employees for granted.



SMT

An impressive machine park as well as our tool and prototype construction are available for the implementation and manufacturing of our products. Over 100 plastic processing machines and more than 240 CNC machining centers work in 3 shifts, 6 days a week. Automated processes span all production areas, SMT systems, continuous ovens for soldered connections or highly efficient production cells with integrated robots guarantee the best quality. Of particular note is the fully automated pipe production including testing using a TÜV-certified process.

In our tool shop we have a team of more than 180 employees for the design and manufacturing of tools.

The majority of our production equipment was developed and manufactured in-house, including all stamping tools, die casting tools, rubber tools and tools for plastics processing.

With an additional group of employees, we can implement prototypes at short notice in order to sustainably accelerate the processes of product development for new products.



Electronics Plug-In

Notes

A series of horizontal dotted lines for writing notes.



Indicating technology
and sensors



ROAD Deutschland GmbH
Steinäcker 2
75015 Bretten - Gölshausen
Germany
www.road-online.de

Tel: + 49 7252 535 69-0
Fax: + 49 7252 535 69-99
E-Mail: info@road-online.de

TÜV PED+2000, IATF 16949, ISO 9001:2015 and ISO 14001 international certificate

