AN AVX GROUP COMPANY

Emissions control
排放控制
Exhaust gas after-treatment
尾气后处理

Automotive Sensing and Control
汽车传感和控制

www.abelektronik.com

www.avx.com

Mobility is an important factor for the global economy
流动性是全球经济的重要因素

Strict exhaust gas standards require increasingly individual sensor solutions and innovative technologies.
We are at home in this market and offer you the appropriate solution for your project.

严格的尾气标准日益要求采用个性化的传感器解决方案和创新技术。我们熟悉该市场，能为您的项目提供合适的解决方案。

Exhaust gas after-treatment	尾气后处理	Page 4-5 / 第 4 页 ~ 第 5 页
High temperature sensors	高温传感器	Page 6 / 第 6 页
Differential pressure sensors	压差传感器	Page 7 / 第 7 页
Temperature sensors	温度传感器	Page 8 / 第 8 页
Pressure sensors	压力传感器	Page 9 / 第 9 页
Quality sensors	质量传感器	Page 10 / 第 10 页
Global footprint	全球足迹	Page 11 / 第 11 页

Belief in future mobility

相信未来的流动性

Sustainability, security and convenience are the benchmarks of future mobility.
Next generation of future mobility means better driver communication and intelligent support. Enhanced electronic networks provide a superior driving experience combined with high levels of efficiency. Sensors deliver all necessary information from environment or from vehicle to these networks.

In our role as best in class supplier of sophisticated sensors, we offer intelligent sensor solutions to our customers, e.g. for exhaust gas applications.

We evaluate trends for future viability and, as leading advisors and experienced developers, we support you when it comes to effectively and reliably integrating innovations with customer applications.

We look forward to continuing to reshape the future of mobility and to being your source for sophisticated electronic solutions.

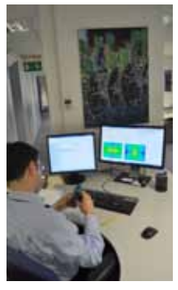
可持续性、安全、便利是未来流动性的基准。
下一代未来流动性意味着更好的驾驶员通讯和智能支持。增强的电子网络能提供极好的驾驶体验并提高组合效率。传感器将所有必要的环境信息或车辆信息提供给这些网络。

作为在同行中最好的复杂传感器供应商，我们为我们的客户提供尾气应用等所需的智能传感器解决方案。

我们评估未来可行性趋势。作为领先的顾问和经验丰富的开发者，在需要有效、可靠地将创新与客户应用相结合时，我们为您提供支持。

我们期待继续重塑流动性的未来，并成为您的复杂电子解决方案的来源。

Sample-shop 3D-Printer
样品车间三维打印机



Computer simulation
电脑模拟

In-house expertise
内部专门知识

SMD
表面贴装器件

Technology development
技术开发

Flexible automation
灵活的自动化

Qualified for excellent performance
We provide our customers with a wide range of in-house expertise. External interfaces are minimised and proven AB Elektroniks' quality runs like a thread through our global projects.

有提供优良性能的资质
我们为我们的客户提供大范围的内部专业知识。AB Elektroniks 久经考验的质量像一条线一样贯穿我们的全球项目。

Exhaust gas after-treatment

Since the Euro 4 standard, AB Elektronik has been an accredited partner of truck manufacturers for development and production of sophisticated sensor solutions for exhaust gas applications. To complement our existing technologies for exhaust gas monitoring we are on course to meet the requirements of Euro 6 and Tier 4 emissions as well as other international requirements as BS VI (India) or CH6 (China).

For those applications, the nitrogen oxides (NO, NO_2 = NO_x) generated in the engine during combustion have to be eliminated actively. In the so-called selective catalytic reduction (SCR), an aqueous urea solution (32.5 % NH_3) is injected into the hot diesel exhaust.

The products are harmless nitrogen and water. To meet the requirements for solution monitoring, precise detection of pressure and temperature are required. Ceramic pressure sensor cells of our own production are characterized by high media tolerance, and are designed specially for this application. The coordinated integration of these pressure sensors into different customer systems ensures convenient installation and reliable operation, even at low outside temperatures.

A further example of innovative solutions is our unique optical urea concentration sensor. Using refractometry we created a sensor family for different application around SCR dosing.

For optimum control of a number of additional functions in exhaust gas after-treatment, AB Elektronik possesses innovative products and a high overall expertise in this special field.

自 Euro 4 标准实施以来，AB Elektronik 已是载重车制造厂的可靠合作伙伴，开发并制作尾气应用所需的复杂传感器解决方案。为了完善我们现有的尾气监控技术，我们会继续满足 Euro 6 和 Tier 4 的排放要求及 BS VI（印度）或 Ch6（中国）等其他国际要求。

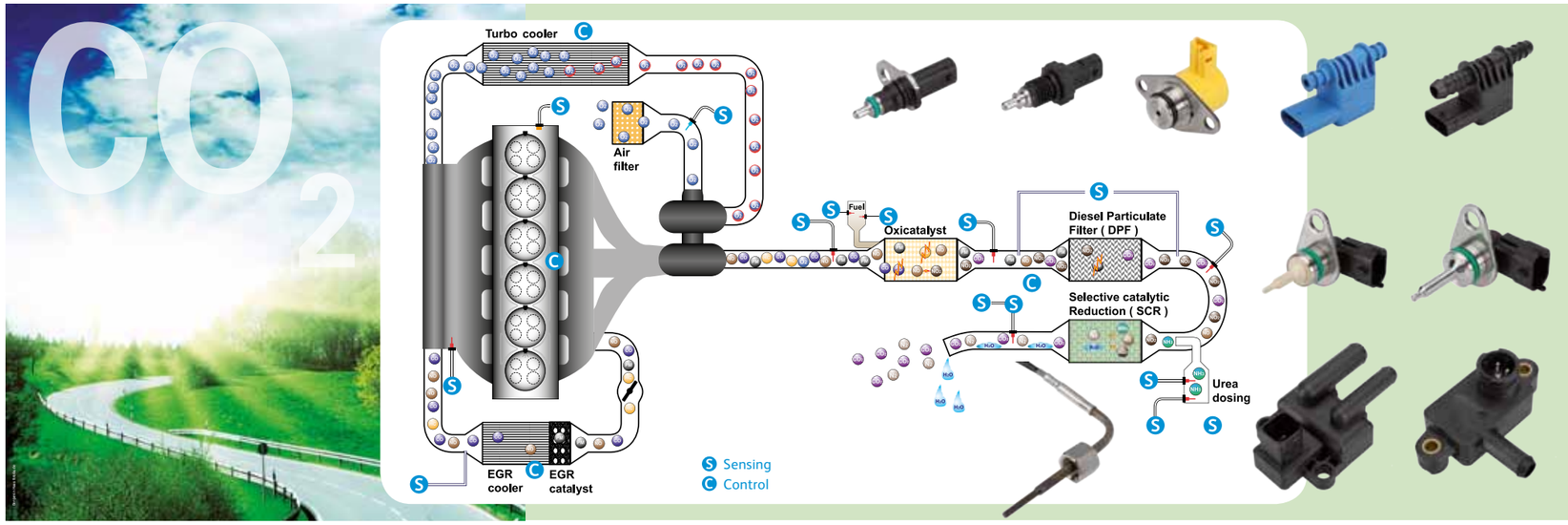
关于那些应用，必须主动消除燃烧时发动机中生成的氮氧化物 (NO, NO_2 = NO_x)。在所谓选择性催化还原 (SCR) 中，需要将尿素水溶液 (32.5% NH_3) 注入高温柴油机尾气。

产物为无害的氮气和水。为了满足溶液监控要求，必须能精确地检测压力和温度。我们自己生产的陶瓷压力传感器元件具有介质耐受性高的特点，专为该应用设计。这些压力传感器被完美地集成到不同的客户系统中，保证安装方便，甚至在较低的外部温度下也能可靠运行。

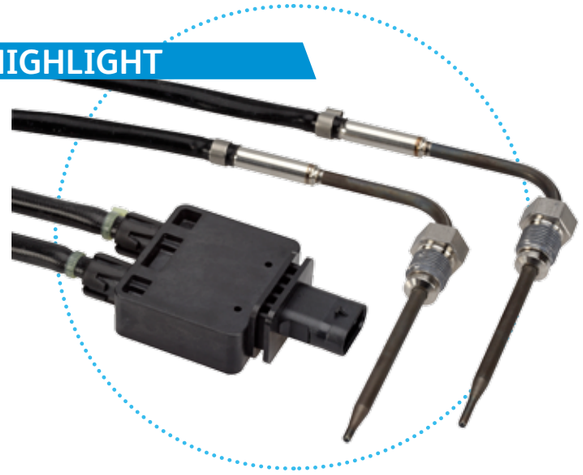
创新解决方案的另一个例子是我们独特的尿素浓度光学传感器。我们用折射测量法创建了以 SCR 加药为中心的不同应用的传感器系列。

为了实现尾气后处理中许多附加功能的最佳控制，AB Elektronik 在该特殊领域拥有创新产品及高水平的总体专门知识。

尾气后处理



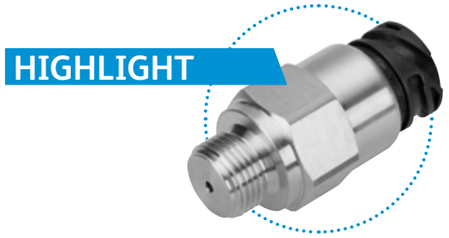
HIGHLIGHT



High-temperature sensor for sophisticated applications of up to 1100 °C with thermocouple

高达 1000 °C 的复杂应用场合使用的带热电偶的高温传感器

HIGHLIGHT



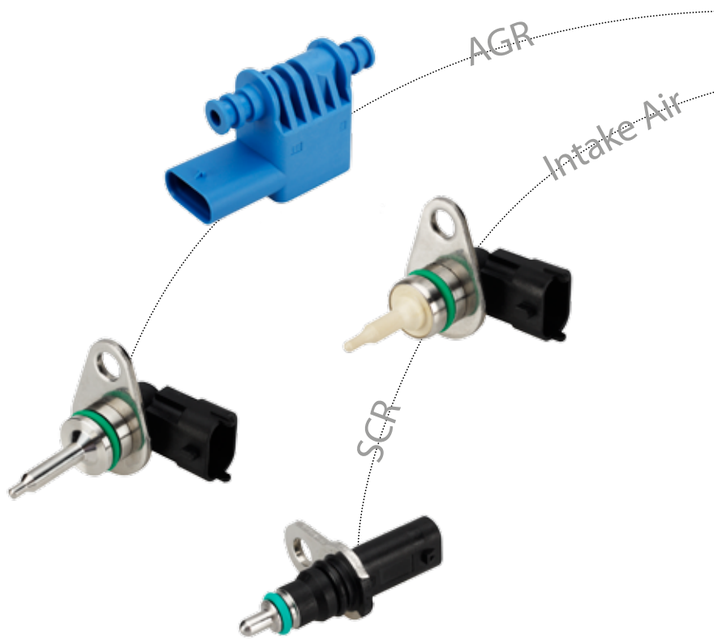
Robust pressure sensors for applications in the exhaust pipe

排气管中的应用所需的压力传感器

HIGHLIGHT

Pressure sensor for SCR applications

SCR 应用所需的压力传感器

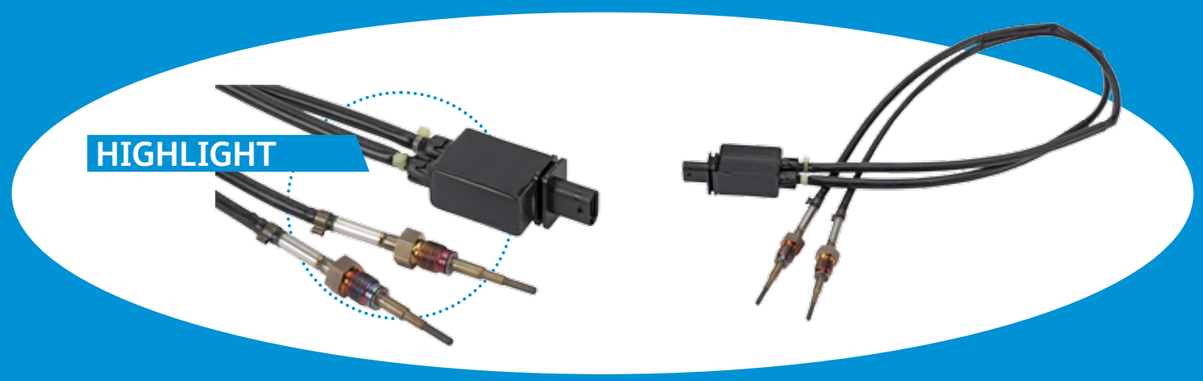


Stricter rules: Euro 6 will increase challenges for Diesel and Otto engines
Since Euro 5 was implemented in 2008, Diesel-particle filters have been used in the exhaust pipe, monitored by robust temperature sensors. They detect parameters for the burning process which is regularly started during operation. Regeneration is an internal burning process, which starts at about 500 °C, and due to exothermicity, i.e. the release of heat during a chemical reaction, temperatures in the range of 700 to 800 °C can be achieved. The accurate temperature monitoring during this process is very important.

Our robust sensors in PT high-temperature design are proven by their long-term-stability and high accuracy over lifetime, providing fast response time of the sensor.

By the introduction of the latest emission standard (Euro 6d) in September 2018, all Otto engines with direct fuel injection will also be equipped with a particle filter. The operating conditions will cause higher temperatures than in diesel vehicles. Based on our proven PT sensor, we have added some special processing steps and used high-temperature resistant special steel in thermoforming quality. The new design with thermocouple type N proven for temperatures up to 1,200 °C can be used at any point in the exhaust pipe e.g. in the exhaust manifold for the protection of the turbo charger.

更严格的规定：Euro 6 对柴油机和奥托发动机的要求更加严格
自 2008 年 Euro 5 实施以来，柴油机颗粒滤清器已在排气管中使用，由温度传感器监控。它们检测在运行时定期启动的燃烧过程的参数。再生是一个内部燃烧过程，起始温度约 500° C。由于放热性，即化学反应放热，可达到 700 ～ 800 ° C 的温度。在该过程中对温度进行准确的监控非常重要。
在 PT 高温设计中我们的传感器证明在整个使用寿命中有长期的稳定性、高度的准确性及快速响应时间。
通过在 2018 年 9 月引入最新的排放标准 (Euro 6d)，所有直接燃油注入奥托发动机也装备颗粒滤清器。工况造成的温度会比柴油车的高。基于我们成熟的 PT 传感器，我们已增加了一些特殊处理步骤，并在热成形工艺中采用耐高温特种钢。带 N 型热电偶的新设计证明能用于高达 1200 ° C 的温度，可用在排气岐管等排气管中任何地方，以保护涡轮增压器。



Petrol engines: twin assembly temperature sensors for Euro 6c requirements
Used as a twin assembly, the new sensor concept precisely meets the requirements of this application. The combination of two sturdy sensors with evaluation electronics provides proven high robustness coupled with fast response times, but also allows synchronization of the sensors to within +/- 1 °C. The twin assembly design means that the user benefits from a proven sensor with extended functionality, and at a favourable cost.

汽油发动机：满足 Euro 6c 要求的双组件温度传感器

新传感器概念采用双组件，正好满足该应用的要求。两个带评估电子器件的稳健传感器的组合提供成熟的高鲁棒性及快速响应时间，并且达到 +/- 1 °C 的同步性。双组件设计意味着用户只需付出有利的成本就能从具有扩展功能的成熟传感器中获益。

Pressure measurement in the exhaust system (particulate filter)
The next level: Diesel Engines Euro 6 need another catalyst – differential pressure sensor for Euro 6 applications will support with improved accuracy.
To meet the requirements and to achieve a reduction in nitrogen oxides, there is needed another catalyst behind the particulate filter. This places further demands on the sensor. The load on the particulate filter is key, and in this new application it is necessary to measure the dynamic pressure before and also behind the filter, to determine the pressure drop across the filter system. With the Euro 6 standard this is achieved using differential pressure sensors. To examine its pressure, the exhaust gas is led via hose lines directly to the pressure cell. This media is highly aggressive and can destroy the electronics on the active side of pressure membrane and render the sensor unusable. In low cost sensors with only one cell, the membrane is protected from the exhaust components by a gel which is unfortunately not stable over lifetime of the sensor.

排气系统压力测量（微粒滤清器）
下一等级：柴油发动机 Euro 6 需要使用另一种催化剂 – Euro 6 应用所需的压差传感器的精确性提高

为了满足要求并减少氮氧化物，需要在微粒滤清器后使用另一种催化剂。由此对传感器提出进一步的要求。微粒滤清器上的负荷很关键。在该新应用中，必须测量滤清器前后动态压力，以确定过滤系统压力降。有了 Euro 6 标准，这可通过使用压差传感器实现。为了对其压力进行检查，尾气经软管管路直接送至压力元件。该介质是高侵袭性的，能毁坏压力膜活性侧的电子器件而使传感器失效。在只有一个元件的低成本传感器中，用凝胶来保护薄膜不受排气部件损害，但该凝胶在传感器使用寿命中并不稳定。

New differential pressure sensor: better lifetime and two redundant signals
The new sensor of AB Elektronik uses ceramic pressure cells which come into contact with the exhaust gas only from the side and without a printed measuring structure. Additional protection is not necessary here. With this two cell pressure measurement technology, we have succeeded in developing an unbeatably robust, durable and still very accurate differential pressure sensor. These outstanding properties are already proved in the commercial vehicle sector. With this sensor, we can provide additional added value by delivering a pressure signal before or after the filter as a stand-alone signal beside the differential signal.

新压差传感器：更好的使用寿命及两个冗余信号

AB Elektronik 的新传感器采用陶瓷压力元件，这些陶瓷压力元件只从侧面与尾气接触，无打印测量结构。这里无需进行附加保护。采用该双元件压力测量技术，我们已成功地开发了一种极其耐用却很精确的压差传感器。这些优良的性质已在商用车辆行业得到证明。该传感器除了提供差动信号外，还提供滤清器前后压力信号作为独立信号，由此为客户带来附加值。

Temperature sensors / 温度传感器

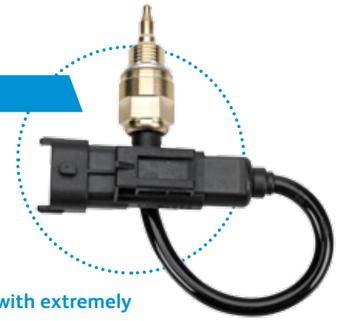
Intelligent sensor concepts for fast and precise temperature detection - in the most demanding applications
Temperature sensors from AB Elektronik are reliable, fast and precise in liquid and gaseous media or solid body such as water, oil, fuel, intake air and charge air as well as cylinder head / crankcase. With more than 20 years' experience in developing and producing temperature sensors, we partner with major OEMs and tier 1 / 2 suppliers in the automotive industry.

Technologies and special features:
- Housing: plastic, brass, steel
- Technology: NTC, PT, thermocouples, semiconductor
- Standard application 150 °C, special application 300 °C
- Optional programmable electronic interfaces
- Connector, measuring element, mechanic and electric interfaces according to customer requirements
- Low-weight miniature versions with minimised metal content
- Long term robustness against vibrations and dust / humidity
- Thermal decoupling for excellent measurement accuracy

AB Elektronik 的温度传感器在水、油、燃料、进风、增压空气及气缸盖/曲柄箱等液体、气体介质或固体中可靠、快速、精确。我们在开发和生产温度传感器方面有 20 多年的经验，与汽车行业主要原始设备制造商及 1 级/ 2 级供应商合作。
技术及特性：

- 外壳：塑料、黄铜、钢
- 技术：NTC、PT、热电偶、半导体
- 标准应用 150 °C，特殊应用 300 °C
- 可选可编程电子接口
- 根据客户要求，提供接头、测量元件和电子接口
- 具有最低金属含量的轻巧迷您版本
- 长期稳定性，防振、防尘、防湿
- 热解耦，实现优良的测量精度

HIGHLIGHT



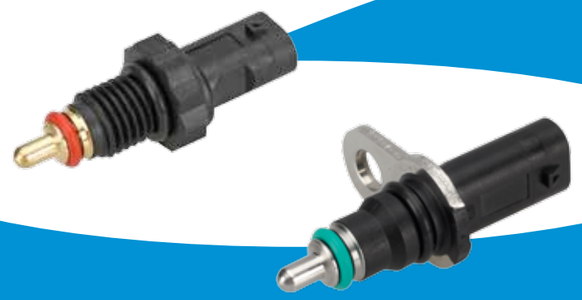
Temperature sensor with extremely short response time

反应时间极短的温度传感器

HIGHLIGHT

Special sensor for direct housing measurement (thermal management)

直接用外壳测量的特殊传感器（热管理）



Pressure sensors / 压力传感器

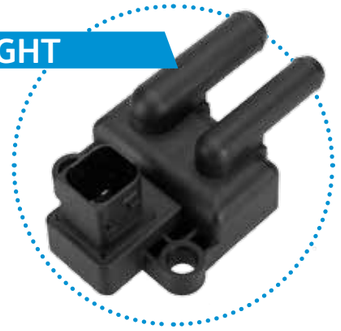
Technologies
- Ceramic measuring cell
- Semiconductor measuring cell
- Pressure range: 0 … 0.5 bar to 0 … 60 bar
- Temperature range: -40 °C to +125 °C, 150 °C

Connectors according to customer specification
High vibration resistance

技术
- 陶瓷测量元件
- 半导体测量元件
- 压力范围: 0 ……0.5 帕~ 0 ……60 帕
- 温度范围: -40 °C ~ +125°C，150 °C

符合客户规范的接头
高抗振性

HIGHLIGHT



Differential pressure sensor is not being influenced of atmosphere. Sensing of differential pressure and velocity head in high longterm stability

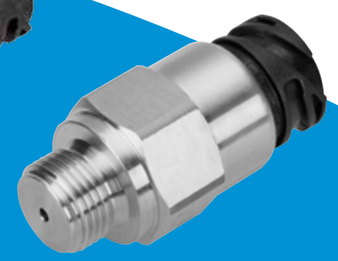
压差传感器不受大气影响。长期高度稳定的压差和速度水头传感

Latest generation pressure sensors are absolutely solid and have excellent long-live characteristics. They win by their modular-building-concept and can be integrated into customer systems easily.
AB Elektronik offers a great number of innovative and robust solutions for measuring pressure in different media. Due to flexible configurations, our pressure sensor modules can easily be integrated into customer-specific systems.

There is an increasing need for continuous pressure monitoring in commercial and working vehicles as well as passenger cars.
A great variety of different basic technologies enables us to optimally suit sensor features to the respective customer application.

最新一代压力传感器绝对可靠，具有使用寿命长的优点。它们凭借模块化建造概念脱颖而出，易于集成到客户系统中。
AB Elektronik 提供在不同介质中测量压力的各种创新的、稳健的解决方案。由于配置灵活，我们的压力传感器模块易于集成到具体客户的系统中。

在商用车辆和工作车辆及乘用车中，日益要求进行连续压力监控。各种不同的基本技术使我们能将传感器特性最佳地契合到各自的客户应用中。



Latest regulation: AdBlue® quality is critical for clean vehicle operation

Selective catalytic reduction (SCR) has been used in diesel vehicles (passenger cars and trucks) for many years to improve emission quality by reducing levels of nitrogen oxides. For this process, a water-based fluid called AdBlue® is injected, with a pressure, into the exhaust gas after it has passed the particulate filter. This produces ammonia and starts a chemical reaction with the NO_x molecules, converting them into nitrogen and water. The exhaust gas cleaning process is electronically controlled and goes mostly unnoticed by the driver.

Driven by the latest legislation, the driver will now be warned if the AdBlue® concentration in the exhaust gas is not meeting specification. A series of visual or acoustic warnings will alert the driver, and the vehicle may then enter a limited speed emergency-run' and eventually stop altogether.

It is more important than ever to have continuous control of the quality and the fuel level inside the AdBlue® tank. There are different technologies available, but not all can guarantee accuracy over long periods. Using special optical techniques the sensor from AB Elektronik is capable of detecting variances in urea concentration as small as +/- 2 %, and can operate at temperatures from -10 °C to +85 °C. The optical measurement approach is resilient to dirt and moving fluids including petrol (gasoline), diesel or coolant.

We offer versatile solutions in customer specific design:

- Tank or in-line assembly
- Quality and level combined solution
- Robust modular design

最新规定： AdBlue® 的品质对于车辆的清洁运行非常重要

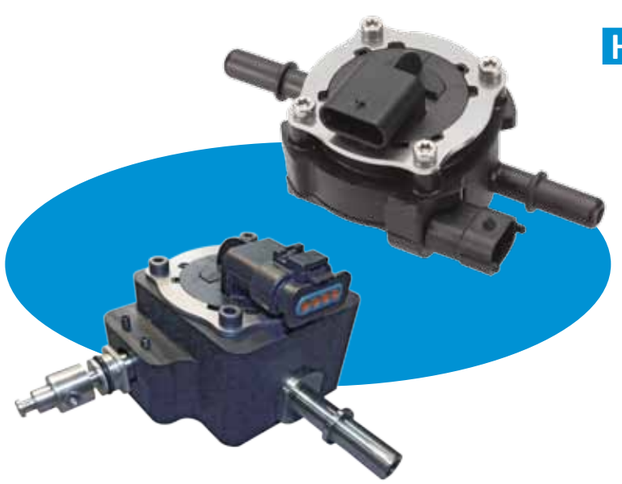
为了通过减少氮氧化物的水平来改善排放质量，选择性催化还原 (SCR) 已在柴油车（乘用车和卡车）中使用多年。为此，需要在尾气通过微粒滤清器后在某一压力下将一种称为 AdBlue® 的水基流体注入尾气。由此生成氨，并开始与 NO 分子起化学反应，将其转换成氮气和水。尾气清洗过程以电子方式控制，通常不为驾驶员所注意。

现在受最新立法驱动，若尾气中的 AdBlue® 浓度不符合规范，驾驶员会受到警告。一系列可视或可听的警告先会警示驾驶员，然后车辆进入限速“紧急运行”，最终完全停止。

比以前更重要的是，会对 AdBlue® 箱内的品质和油位进行连续控制。可提供不同的技术，但并非所有技术能长期保证精确性。AB Elektronik 的传感器采用特殊的光学技术，能检测小至 +/- 2 % 的浓度变化，并能在 -10 °C ~ +85 °C 温度下运行。光学测量法耐受污垢及包括汽油、柴油或冷却剂在内的流动流体。

在具体客户的设计中，我们提供丰富的解决方案：

- 箱或同轴组件
- 品质和液位组合解决方案
- 稳健的模块化设计



HIGHLIGHT

Robust refractometer in solid plastic design for detection of concentration of AdBlue®. Inline adaptation possible

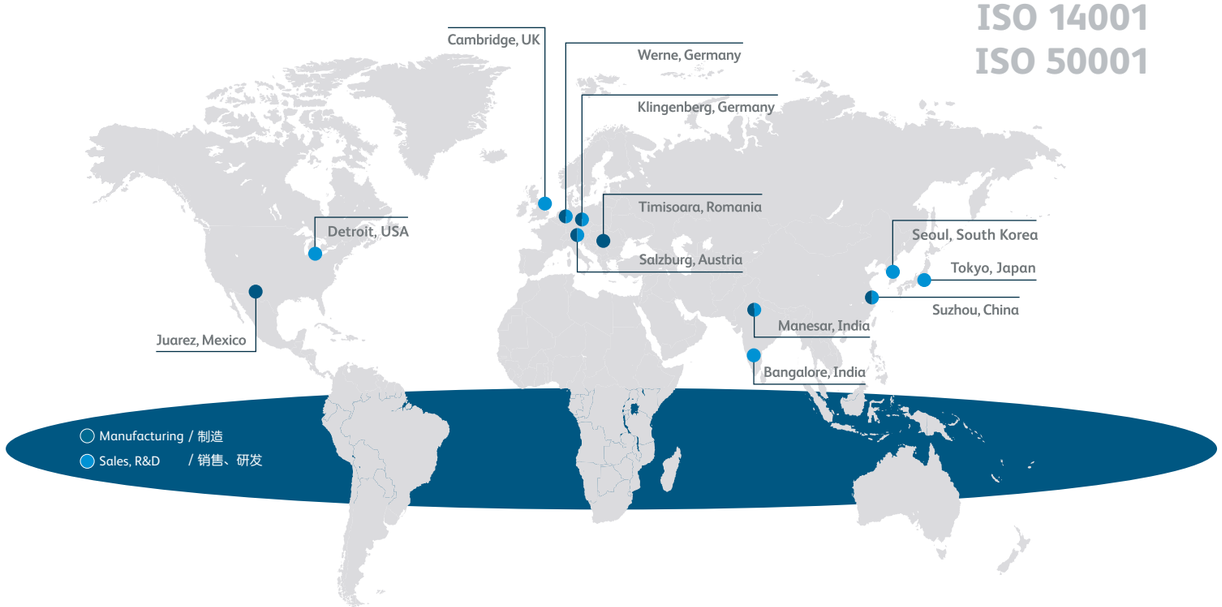
固体塑料设计中用于检测 AdBlue® 浓度的折射计可实现同轴适配性

Deploying our expertise globally, delivering value for our customers locally

在全球部署我们的专业服务，在当地为我们客户提供价值

Certified quality / 质量认证

IATF 16949
ISO 14001
ISO 50001



Learn more about
Automotive Sensing and Control:
汽车传感和控制详见：
www.abelektronik.com

Learn more about AVX:
AVX 详见
www.avx.com

sensing@abelektronik.de
control@abelektronik.de

With compliments

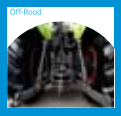
广受赞誉

AN AVX GROUP COMPANY

Editorship / 编辑:
Marketing Communications AB Elektronik Sensing and Control
AVX Group Companies
营销传播 AB Elektronik 传感和控制
AVX 集团公司

地址：AB Elektronik GmbH, Feldmark 50, D-59368 Werne
电话 +49 2389 788-0，传真 +49 2389 788-190, info@abelektronik.de

www.abelektronik.com **www.avx.com**



06.2018 图片：AB, © shutterstock.com, fotolia.de