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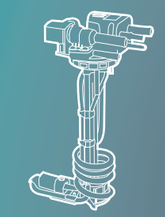
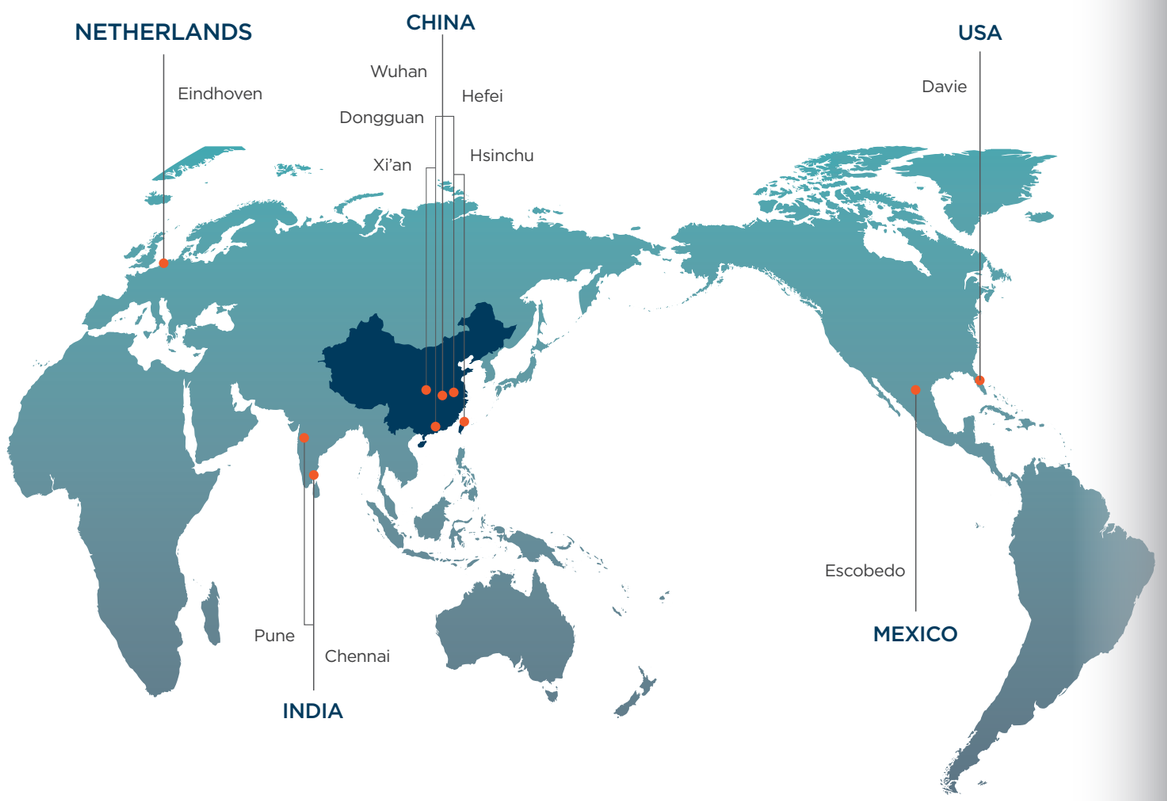
KUS

Sensing Quality, Gauging Success.

THE WORLD'S LEADING SUPPLIER OF SENSORS AND INTEGRATION SOLUTIONS





Founded in Taiwan in 1984, KUS is a global auto parts supplier integrating R&D, production, sales and service.

KUS Group focus on providing package solutions for CV, PV, off-road equipment, marine equipment, generator equipment.

KUS produces AdBlue quality / level sensors, AdBlue tank assemblies, fuel sensors, fuel tank assembly,genset sensors, gauges, millimeter wave radar, monocular camera, Driver Monitoring System, 3D Around View Monitoring system, Vehicle Control Unit, PTC Coolant Water Heater, etc.

As a global corporation, KUS Group has more than 5,000 employees, 12 branches along with a worldwide partner network.

Adhering to the corporate vision of “Make breathing cleaner, make driving more perceptive”, KUS will continue to focus on reducing emissions and efficient driving, and continue to create maximum value for its customers.

KUS Dongguan

KUS Hefei

KUS Wuhan

KUS Automation

KUS Taiwan

KUS India

KUS Europe

KUS USA

KUS Mexico

Milestones

1984

The first reed-switch level sensor was lauched by KUS.

1990

Plenty of KUS fuel sensors were applied in European OEMs.

2004

The first AdBlue sensor is developed and produced by KUS.

2010

The 1st generation AdBlue sensor integrated with coolant water valve was applied in US market.

1984

Taiwan company was established, KUS brand was cultivated.

1994

KUS USA branch was established, supporting worldwidely in US.

2003

KUS headquarter moved to Dongguan, and set up the manufacture base.

2008

KUS 1st phase factory was built and run, the company has accomplished step growth.

2013

KUS R&D branch was built in TW, supporting the innovation development.

2013

The integrated AdBlue quality sensor was developed.

2016

KUS developed PTC Heating Unit , VCU and began to build ADAS products such as 3D AVM.

2017

KUS developed millimetre wave radar, monocular camera, Driver Monitoring System,etc.

2016

KUS India branch was built, supporting worldwidely in South Asia.
KUS Europe branch was built, supporting worldwidely in EU.

2017

KUS Hefei branch was founded, meanwhile, KUS extended the product lines to intelligent networking of car and new energy car industries.

2018

KUS has set up an AI algorithm and image processing R&D center in Wuhan.

2019

KUS set up a factory in Mexico.

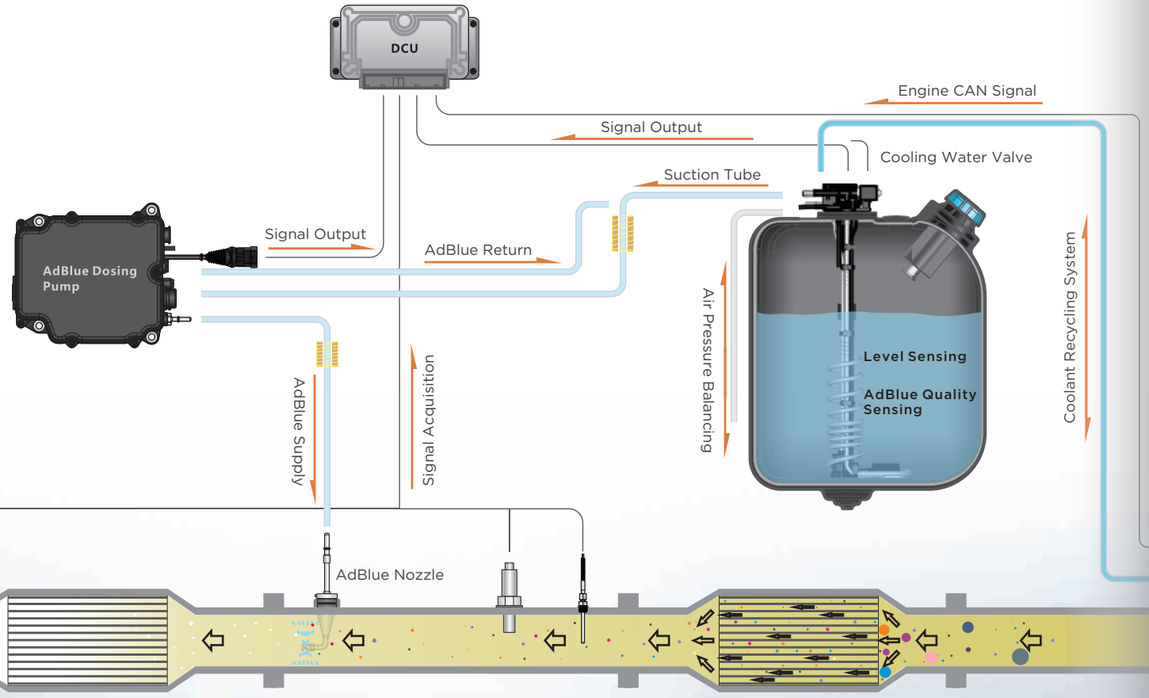
2020

KUS established Xi 'an R&D Center

CONTENTS

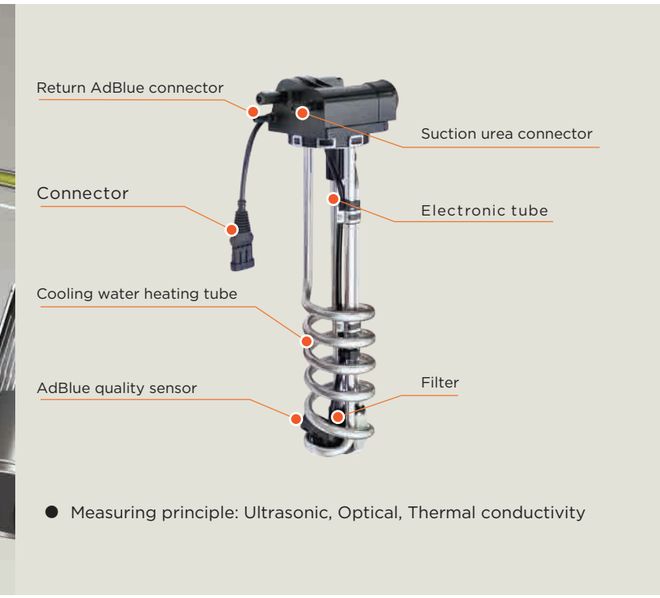
CHAPTER
SCR System Application

SCR (Selective Catalytic Reduction) exhaust treatment system is adopted worldwide to reduce air pollution and emissions from vehicles. Through the reaction of the AdBlue solution with the NOx, the SCR system generates harmless N2 and H2O.



CHAPTER
AdBlue Quality Sensors

As the world leading manufacturer of AdBlue sensor, KUS products conform with international emission regulations of Euro VI, Tier IV F, EPA2019, Stage V/VI and etc., KUS products are used in worldwide SCR system for on-road machinery and off-road machinery.
The AdBlue quality sensor can accurately monitor the concentration and quality of the Adblue solution, and alert the user if the AdBlue concentration with deviation or any contaminated fluids in the tank. To ensure the vehicle emissions can comply with Euro VI and more stringent emission laws and regulations.
KUS AdBlue sensor advanced integrated solutions : AdBlue quality detection, liquid level detection, urea thawing, AdBlue sensor can also be customized according to different requirements from customers. Different solutions support your system to work well in different climates and environments.



- Measuring principle: Ultrasonic, Optical, Thermal conductivity

Advantage:

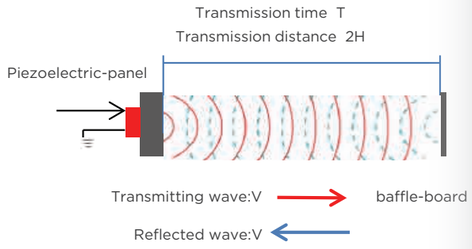
- Signal output with high precision
- Stable and continuous output signal
- Resistant to environmental variations
- Integrated key features
- Selectable length subject to users' application
- Options of different electronic connectors
- Custom design formation optimized for different tank design

CHAPTER
AdBlue Quality Sensors

Principle of Ultrasonic Wave

Ultrasonic wave in different media, different concentration of liquid has different propagation speed; By using ultrasonic wave to travel a fixed distance in the liquid and comparing the difference of the time, the difference value of the concentration of the liquid can be obtained.

Signal: CAN(SAE J1939)
Accuracy: ±2%(25%~36%AdBlue)
±3%(＜25%AdBlue,＞36%AdBlue)
Resolution: 0.25%AdBlue



AdBlue Quality Sensor with Valve

- Sensor head with a valve integrated, which can reduce the SCR pipeline connection, lower the leakage risk and also save costs.
- Reduce the installation space of the cooling water valve with simple layout.
- The water valve maintenance is easier and more convenient.
- World-recognized valve supplier, superior quality.

CS9ET

CS8MT

Spiral Shape AdBlue Quality Sensors

AdBlue solution will be frozen at temperature below -11 ℃. It will affect the operation of the SCR system. Hence, we recommend the spiral shape AdBlue sensor for cold region operation. The spiral design could provide better heating efficiency to thaw frozen AdBlue solution, and allow the SCR system to work normally within specific time after engine cold start.
A variety of mounting methods including bayonet, SAE screw pattern with air vent or non-vented respectively.

CS9AT

CS9CT

CHAPTER
AdBlue Quality Sensors

DCL8CT

CL9BS

CN8CT

RD8AT

RD8CR

L-shape AdBlue Quality Sensors

L shape AdBule sensors are developed for customers with large AdBlue tanks. The L shaped tubes extend the heating area of the AdBlue sensor, which melts the frozen liquid and ensure the SCR system to work properly.
A variety of mounting methods including bayonet, SAE screw pattern with air vent or non-vented respectively.

AdBlue Quality Sensors without Heating Function

In warm area, SCR system does not require heating function, the AdBlue sensors only have the features of level indication and integrated suction/return for AdBlue.
A variety of mounting methods including bayonet with air vent or non-vented respectively.

AdBlue Quality Sensors with ARubber Head

Used on narrow tanks, with small sensor mounting ports.
The sensor is fixed with tightening clamp, easy to install and service, no special tools are needed.

AdBlue Tank Assemblies

Produced with high strength engineering plastic material, HDPE.
Tanks are engineered with the characteristics of high impact strength and alkali-resisting performances.
According to various vehicle mounting requirements, we offer different shape and cubage tanks for options. All tanks comply with ISO22241 requirements.

We supply 10L- 150L AdBlue tanks. Tank size and shape can be customized.

KUS AdBlue tank functions include: AdBlue storage, pressure balance, manual and automatic refilling control, refilling nozzle control.
Sensors are matched with different tanks to serve in various application and severe environments.

Extended Filling type AdBlue Tank

- Tanks designs for integrating AdBlue supply modules are available upon request.
- Also we can integrate AdBule pump to meet customers requires.
- These tanks are widely used on light duty vehicles, SUVs and pickup trucks.

80L(21 Gallons)

55L(14.5 Gallons)

45L(12 Gallons)

35L(9.3 Gallons)

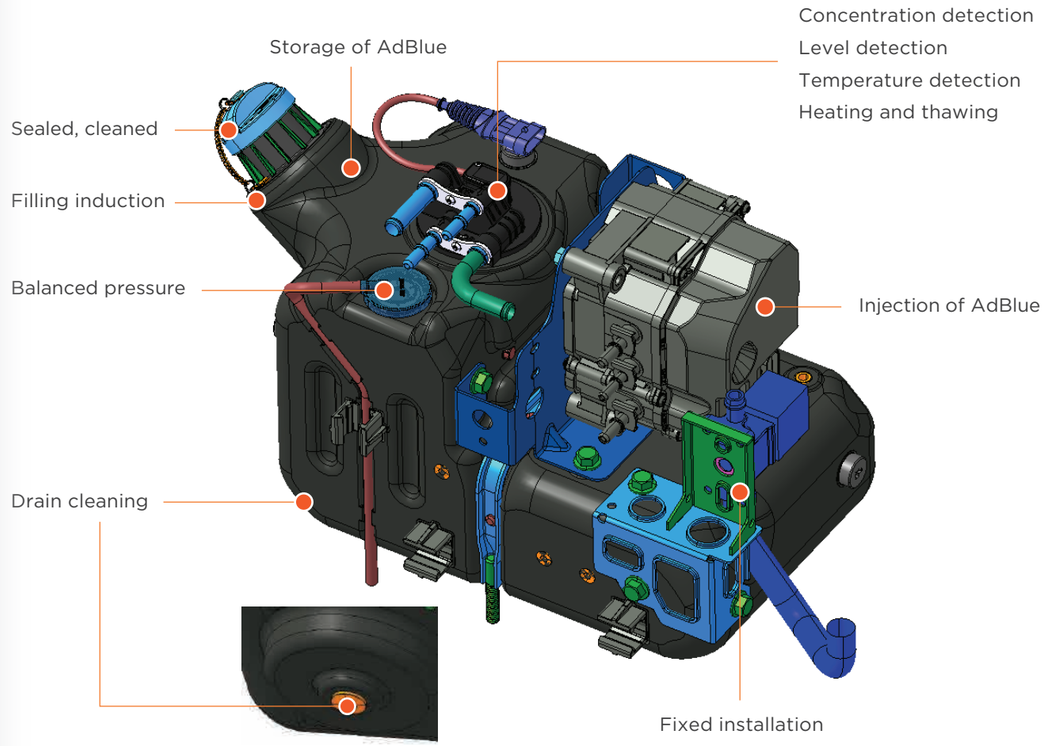
25L(6.6 Gallons)

20L(5.3 Gallons)

16L(4.2 Gallons)

10L(2.6 Gallons)

12L(3.1 Gallons)



KUS AdBlue tank can realize the integration of complex and diverse insert design in various molding processes.

AdBlue tank parameters		
Storage medium	AdBlue	Corrosive, low temperature crystallization
Material	HDPE	High strength and corrosion resistance
Colour	Black	Prevent algae growth and AdBluedecomposition
Craftsmanship	Blow molding/ rotational moulding	Blow molding production capacity is high; Roll molding is complex in shape.

CHAPTER
AdBlue Tank Assemblies

AdBlue Tank Assemblies

Integrated Solenoid Valve

Solenoid valve

Project
MOV：DC24V(⩽20.4V)/ DC12V(⩽10.2V)
MOPD：⩾2.5Bar
Voltage：DC24V/ DC12V
Power：11.5W(DC12V)/ 13W(DC12V)
Main material：Copper/stainless steel
Flow：15L/min(±10%)，Pressure difference 1Bar
Maximum particle size allowed in the fluid：200μm
Work pressure：0~5Bar
Internal and external leakage：⩽2cc/min air, Test pressureAT 7Bar ±5%
Ambient temperature：-40~85℃
Fluid temperature：-40~90℃

With Bracket

Integrated Strainer

Filter

CHAPTER
AdBlue Tank Assemblies

Extended Filler Neck

AdBluetank cover

Magnetic Filler Neck

Balanced pressure function

Vent valve

Drain cleaning function

Drain screw

Integrated pump function

Expansion tank

Water tank material: PP material
Color: translucent
Pressure: positive pressure 75 ± 10KPa, negative pressure -2 ~ -8KPa
Total volume: 12.8L
Overflow pipe length: 1.2 meters

Nozzle

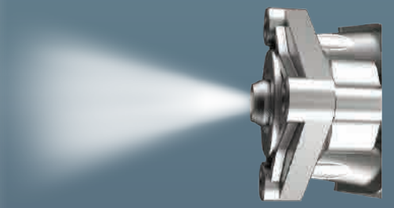
KUS is equipped with professional R&D team and manufacturing capabilities. KUS can assist customers to develop AdBlue nozzles for different applications.

Rich nozzle design experience
Efficient production of samples
Comprehensive verification capability
Senior technician
Professional structure and performance optimization capabilities
Professional cost optimization

Various production processes: pipe making, bending, stamping, CNC, welding, brazing, etc.
Brazing line that meets AWSC3.6, ASWE 2750, etc.
Fast production and delivery capabilities
Rich nozzle production experience and complete production line

CHAPTER
AdBlue Nozzles

CHAPTER
AdBlue Nozzles



Electronically controlled nozzle

Specification:
Norminal voltage: 12V/24V
System pressure: 9Bar
Frequency: 10Hz
Spraying angle: ≈30°
Atomized particle size: SMD(D3,2)＜60um
Working temperature:- 40℃-120℃
Flow range: 100g/h-6800g/h
The diameter of the urea pipe and the cooling water pipe joint are ϕ7.89 and ϕ9.49, which conforms to the SAE J2044-2009 standard.

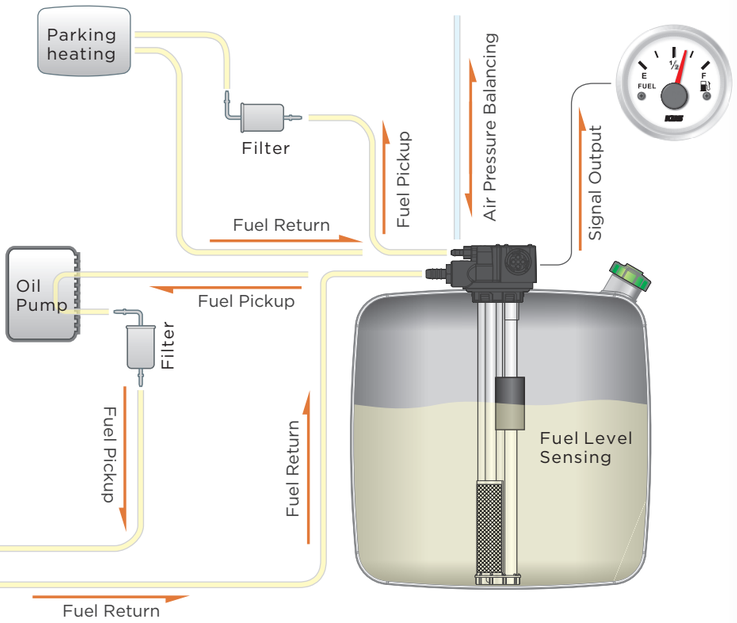
Annular cooling water channel, uniform cooling

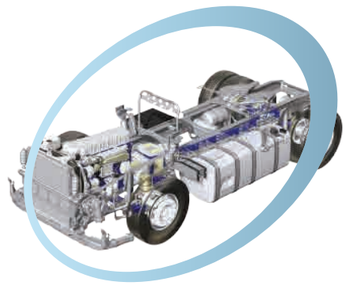
Favorable spraying effect

Parameter	Value	Remarks
Nozzle holes	3	
Nozzle angle	120°	
Conical atomization（α）	20°±5°	AdBluepressure 900kPa, ambient temperature 21 ±2 °C
Radial deviation angle（δ）	--	
Axial deviation angle（γ）	--	
Atomization particle size（D32）	60um	Deionized water, pressure 900kPa

CHAPTER
Fuel System Application

KUS has variety of solutions available for fuel and water level detection. Reliable and customized solutions can be developed in requested time with our strong R&D capabilities.
KUS sensors and gauges are recognized by world-wide OEMs for its superior quality and performances.





CHAPTER
Fuel Level Sensors

SAP

SAF

SAG

SAD

SADH

Sensors of Alu. Type

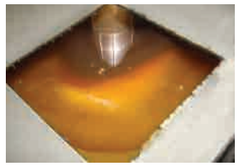
SAP sensors are mainly used in trucks and buses. In addition to measuring oil level, they are equipped with engine inlet/outlet, parking heating system inlet/outlet, and air valves to balance the pressure inside and outside the tank and prevent oil leakage from rolling over.

- Main material: High quality aluminum alloy
- Installation: Bayonet twisted for easy assembly.
- Signal output: Resistance, voltage, current or CAN-BUS signal.

Other Types Truck Multi-function Fuel Sensors

Heating Fuel Sensors

Fuel sensor adopts PTC heating or engine coolant circulation heating, which has high heating efficiency and can automatically control the temperature.Combustion efficiency can be increased by 5%, while reducing exhaust emission pollution;In the same environment can reduce fuel a brand, effective cost savings.



High Resolution Integrated Level Sensors

The sensors combine Multi-functions, including measuring liquid level, suction/return pipes for engine and vehicle heating system, balancing the pressure of the tank and the atmosphere, temperature alarm, ect.

- Main material: High quality aluminum alloy
- Resolution: 0.1mm
- Accuracy: 2mm
- Measuring principle: AMR，Capacitance
- Signal output: Resistance, Voltage, CAN, SENT, RS-232, RS-485.

The Capacitance Level Sensor (CLS), is used to continuously detect fuel level by measuring the capacitance variations as the level changes, it combines advantages of strong stability and long service life.

- Sensor length range is 300mm~1500mm and can be customized.
- Installation： SAE standard 5 holes flange, other installation
  methods are available.

CHAPTER
Fuel Level Sensors

SPEHH

SAH

KAB

SADR

CLS2

CLS4

CHAPTER
Fuel Level Sensors

TN

PS5D PS5 S5 S3

Sensors Of Stainless Steel Type

TN series are mainly used for light trucks, construction machines, yachts, etc. Besides measuring the level, an additional suction/return pipe or air ventilation for engine can be customized.

- Main material： Stainless steel
- Installation： SAE standard 5 holes flange or 6 holes flange,
  bayonet twisted is also available.
- Signal output： Resistance, voltage, current or CAN-BUS signal.

Single-tube Sensor Types

S5 & S3 series are widely used in various fuel, water or chemical tanks. With a simple yet reliable structure, starting from 4 inches, every half inch is a standard length.

- Main material： SS 316 & SS 304
- Installation： SAE standard 5 holes, BSP or NPT thread

PS5&PS5D sensors are widely used in fuel tanks, water tanks and other liquid tanks. This sensor has the advantages of light-weight and competitive cost.

Fuel Tank Caps

KUS fuel tank caps have the function of balancing the air pressure between the interior and exterior of the tank. The cap can be made out of engineering plastic or metal. The cap can be equipped with a key and lock ventilation and without ventilation based on customer preference.

CHAPTER
TPMS

Tire Pressure Monitoring System is a wireless monitoring device for real-time monitoring of tire internal pressure, temperature, battery voltage, tire position and other information. TPMS is the third largest car safety system after ABS and airbags. When tire information is abnormal, TPMS can provide early warning in time to effectively reduce major traffic accidents caused by flat tires.
TPMS is mainly composed of tire pressure and temperature detection sensors installed in each wheel and receivers and relays installed in the vehicle. It can be installed on the vehicle to monitor tire pressure and temperature parameters in real time, and visual signals and voice Display and alarm in the form of broadcast.

TPMS-Gas Nozzle Type

- Simple installation, no additional hours
- The air nozzle is locked and fixed without risk of loosening
- National standard air nozzle, strong applicability, easy to standardize
- The sensor position is clear, easy to batch match operation
- Installed in the concave position of the rim, without protrusions, not easy to damage

TPMS-Gas Nozzle Type

TPMS-Strap Type

- The external antenna signal is stable, and the flexible design of the antenna is not easy to break.
- The antenna is independent and not affected by the rim.
- Bundled fixed, not limited by the structure of the gas nozzle.

TPMS-Strap Type

CHAPTER
TPMS

Tire Pressure Monitoring Receiver

Tire Pressure Monitoring Repeater

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Tire Pressure Monitoring Receiver

Tire pressure monitoring receiver is composed of a single chip microcomputer, an antenna, a bus chip, etc. After receiving the information of the sensor or the repeater, the receiver performs data analysis, fault and location judgment, and communicates the data information to be displayed with the display terminal. Can communicate with the vehicle through CAN protocol.
Receiving box adopts the integrated design of the antenna and the housing, which takes up little space, maintains consistency, has stable receiving performance, and has good waterproof performance.

Power On Self Test
Lack-Voltage Alarm
Over Voltage Alarm
Over-Temp Alarm
Loss/Fault Alarm
Low Battery Alarm

Tire Pressure Monitoring Repeater

In order to meet the requirements of tire pressure sensor installed in front wheel tire and sensor installed in rear axle, most automobile manufacturers adopt repeater to amplify the signal of rear axle sensor, so as to ensure stable reception of signal.The repeater receives the information of the sensor and sends the signal to the host with high power to solve the problem of insufficient transmission distance.

CHAPTER
ADAS

ADAS (Advanced Driver Assistance System) uses various sensors (millimeter wave radar, monocular camera, 3D AVM, DMS, etc.) installed on the car to sense the surrounding environment at any time during the driving collect data, perform identification, detection and tracking of static and dynamic objects, and perform systematic calculation and analysis, so that drivers can be aware of possible dangers in advance, effectively increasing the comfort and safety of car driving.

Driver Monitoring System

77GHz BSD/LCA

Monocular Camera

77GHz FCW/AEB

Tire Pressure Monitoring System

3D Around View Monitoring

CHAPTER
ADAS

77GHz FCW/AEB

77GHz BSD/LCA

Monocular Camera

77GHz MMWave Radar

77GHz millimeter wave radar refers to the radar operating in the 76GHz-77ghz band.
With long detection distance and wide Angle, it can detect obstacles, and is mainly used in Forward Collision Warning and Blind Spot Detection.

- Small and compact, high recognition accuracy
- Long range sensing and detection
- Strong penetration, weather proof

FCW
AEB
ACC
BSD
LCA
RCTA

Monocular Camera

- Advanced image processing technology and hardware platform
- IFlexible technology path and high cost performance
- Provide a security assessment platform

FCW
PCW
TSR
PSW
LDW
HMW

Driver Monitoring System

Driver Monitoring System is a driving assistance warning product based on machine vision technology. DMS uses car-level image sensors to capture infrared images of human faces, track eyeball changes, and analyze pupil changes to achieve real-time recognition of driver fatigue and distraction and provide sound alarm information.

- Advanced identification technology
- Automotive-grade professional front-mounted quality
- Support data storage analysis
- Fleet management tool
- Intelligently eliminate interference factors

3D Around View Monitoring

3D AVM, through 4 to 8 wide-angle cameras installed in the vehicle, seamlessly splicing multiple video images collected at the same time to form a 360° aerial view, eliminating vehicle blind spots and making the driver intuitive and clear View the actual road conditions around the car to effectively reduce the occurrence of accidents.

CHAPTER
ADAS

Driver Monitoring System

3D Around View Monitoring

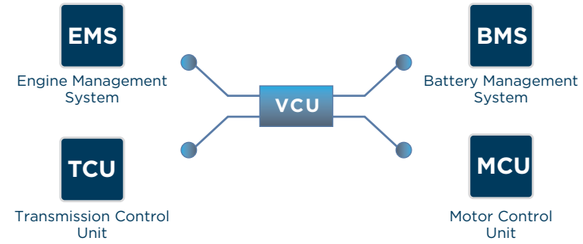
CHAPTER
New Energy Products

Vehicle Control Unit

PTC Coolant Water Heater

Vehicle Control Unit

VCU is the assembly controller of the new energy vehicle power system, which is responsible for coordinating the engine, gearbox, drive motor, power battery, accessories and other components to work together, so as to achieve various control functions of the vehicle, to meet the vehicle power, economy and driving requirements, to ensure the safety of the vehicle.



PTC Coolant Water Heater

PTC Coolant Water heater is mainly used in pure electric, hybrid and fuel cell vehicles. Through PTC heating chip, the cooling water is heated to improve the performance of the battery module of electric vehicles, provide warm air for the whole vehicle cab air conditioning of new energy vehicles, and cold start heating for the hydrogen fuel cell module.Its overall structure is composed of radiator (including PTC heating package), main control panel, high voltage connector, low voltage connector and upper shell, etc., which can ensure the safe and stable operation of the vehicle PTC water heater, and the power change will not cause interference to the body system due to the sudden increase and decrease.

Applications

Pressure Sensor Series

KUS pressure sensors are controlled and manufactured under strict processes to ensure its excellent quality and performances. The fitting thread and output resistance can be customized.

Temperature Sensor Series

KUS water and oil temperature sensors are compatible with many other major gauge brands. This help the customers to easily exchange sub-parts. A temperature alarm for preventing overheating can be added based on preference.

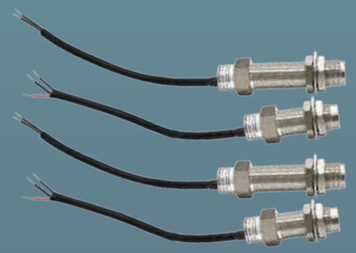
Tacho Sensor Series

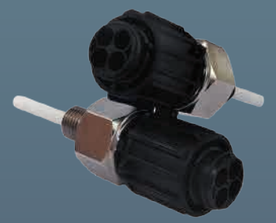
The Tacho sensors are used for measuring gear roatation speed.
The shell appearance, material and thread fitting can be customized as requires.
Measuring principle: Holzer , Magnetoelectric

Water level switch series

The water level switch has a low liquid level alarm function. When the liquid level is lower than the preset position, the alarm switch signal is sent to the external device after a delay of 10s; the delay alarm is to prevent the liquid level from shaking and causing false alarm and alarm. Duration 0~25s (factory setting).

CHAPTER
Engine Sensor





CHAPTER
Gauge Series

KMG Multifunctional LCD instrument

- For NMEA2000, the signal sequence number can be set on KMG;
- Compatible with J1939&NMEA2000, supporting 4 different of
  Analog signals input(Tacho sensor, Fuel, Water temperature and
  Oil pressure sensor)
- IP67 protecting rating
- Fast running speed, low power consumption, high main frequency

KMB Integrated Data Monitor

KMB is an integrated data monitor with an advanced TFT(Thin film tansistor) screen. The unit is compatible with J1939 and NMEA2000 systems. The KMB displays real time network information including engine output, fluid levels and speed. KUS can also customize the unit to meet customer requirements.

Sea Q Series

- Applicable to truck, bus, engineering machinery, generator set, etc fields.
- Bezel material：Stainless steel bezel.
  With reverse polarity connection protection and double layers anti-fog lens.
- Connecting way：6.3*0.8mm terminal strip, can be connected quickly.
- Light：Red and yellow for your option.
- Display accuracy：<3°
- Protection grade：Surface IP67

CHAPTER
Group Culture

KUS Core Values:

Make breathing cleaner
Make driving more perceptive

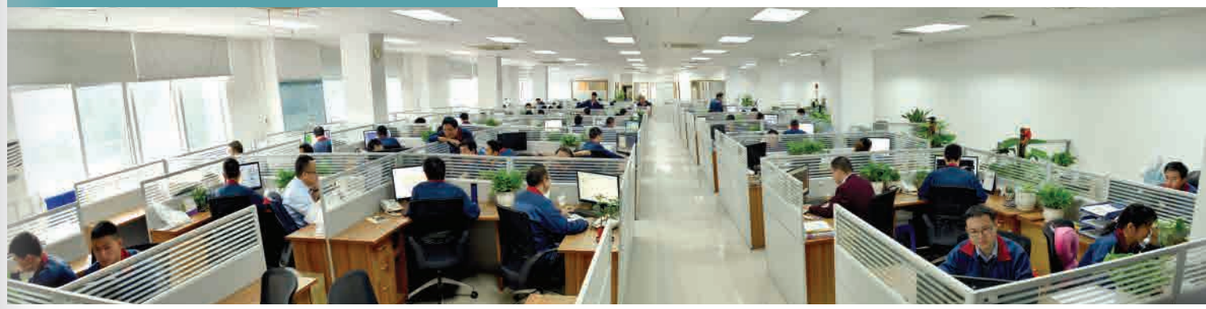
KUS Vision:

Integrity, Accountability,
Innovation, Team

KUS Mission:

Maximize customers' value continuously

CHAPTER
R & D Ability



环境测试实验室
Enviroment test laboratory

雷达实验室
Radar laboratory

影像实验室
Camera laboratory

测量中心
Measurement center

寿命测试实验室
Lifetime test laboratory

化学实验室
Chemical laboratory

物理实验室
Physics laboratory

KUS Group has continuously pursued innovation. With more than 30 years of automotive electronic component design and manufacturing experience, it has obtained more than 200 patents. Its strong R & D capabilities have laid the cornerstone of KUS Group's high-tech enterprises. From concept to product Turn Key solution, KUS has been maintained. Group brand awareness.

KUS Group's R&D team has nearly 500 people. With the introduction of international cooperation concepts, it conducts product development and testing with the world's leading commercial vehicle and non-road vehicle manufacturers to provide customers with the most optimized product solutions. In 2019, the joint millimeter-wave radar joint laboratory of KUS and Xidian University was unveiled, which beneficially promoted the integration of industry and academia and improved the company's independent innovation capability.

In order to ensure that the R&D activities conform to the V-mode model ,APQP and other related processes, the KUS Group equips the R&D department with product lifecycle and software requirements management tools such as PLM,ALM, and code testing tools such as Tessy, Polysapce, LDRA, and IQ-RM Pro DFEMA and PFEMA analysis tools ensure R&D processes efficient and compliant. In order to ensure high quality products, KUS group lab covering an area of 1,600 square meters passed ISO 17025 certification in 2016 and obtained CNAS authorization. The lab has test room of environmental, vibration, electronic, aging, physical, chemical and measurement equipped with professional talents from related majors in machinery, automation, electronics, materials, etc.

CHAPTER
Manufacturing Ability

Developed with high speed for decades and continuous investment, nowadays KUS has various advanced production processes and equipments: German TüV certificated tube manufacturing line, more than 80 sets of injection machines, over 240 sets of CNC machines, advanced blow molding machine, high quality brazing line , automatic SMT, and high-performance automatic soldering, etc. KUS has more than 95% of the key parts made in-house, achieves the manufacturing capabilities of a coordinated process from raw material processing to final assembly.

The MES (Manufacturing Execution System) system introduced by KUS Group reports production activities in the production process with real-time and accurate information, MES guidance, initiation and response. Respond quickly to respond to change, reduce production activities without added value, and increase the efficiency of operations and processes.

TQS automated production line

TQS automated production line

SMT

Pipe forming

Wave soldering

CNC machining

Injection molding

Internal mixer

Brazing

Tooling manufacturing

Blow molding

CHAPTER
Company Honor

Company innovation as the cornerstone of development.KUS has won hundreds of honors such as "provincial famous trademark", "provincial famous brand products" and "multiplier enterprise" and "provincial innovative enterprise".The company strives for survival by quality, and takes the lead in passing ISO26262,IATF16949, ISO14001, CE, PED+AD2000 and other certifications within the industry. The quality management system is fully implemented in accordance with international standards.

ISO26262

CNAS

IATF 16949

ISO 9001

ISO14001

CE

PED 97/23 EC

PED+AD 2000

Our End Users

KUS products are sold to Europe , America, Asia and Australia, etc. By working with our partners through multiple channels and continuously providing customers valuable products and services , KUS is in line with international customer certification requirements.