



by **ENOVATION** CONTROLS

**ENGINE CONTROLS AND FUEL SYSTEMS**

发动机控制和燃料系统



## WHO WE ARE 关于我们

Since 1994, EControls has been a leader in the design, engineering and manufacturing of complete engine control solutions supplied to original equipment engine manufacturers. Our customer base includes some of the world's largest and most prestigious OEMs. They utilize our systems in the commercial vehicle, forklift, power generation and off-highway markets for their spark-ignited natural gas, LPG, gasoline and compression ignition engines. We work with our customers to provide proven products, cutting-edge technology and superior engine control solutions.

***When it comes to engine solutions and integration – trust our experts.***

### We Are Innovators.

By partnering with our customers, we understand their application needs and provide solutions that are finely tuned integrated systems. The integrated approach to equipment and engine management provides customers with advanced functionality, optimized performance and reliability.

### We Are Customer Driven.

Our solutions-based approach allows us to be your single source for all your engine and application control needs. We work directly with our customers to identify the exact application requirements and develop a complete system that is tailored for their needs. No more spec'ing out parts – let us do the work for you.

### We Are Eco-friendly.

Emission regulations vary across all markets we serve, and these standards grow increasingly more stringent. EControls has invested to support these requirements allowing our customers to satisfy emission rules while becoming more efficient. Our spark-ignited engine control systems enable significant emission reductions, empowering our customers to meet and exceed any global regulation with the lowest total cost while maximizing conservation of the environment.

### We Are Global.

We are where our customers are. In North America, operations are centrally located in San Antonio, Texas, with additional offices in Tulsa, Oklahoma, and Rosenberg, Texas. We service the Asian market through our operations in Hangzhou, China, and Europe through the United Kingdom. Additional international sales offices are located in India, South Korea and Latin America. Customer support is achieved through our extensive distributor and dealer networks available throughout the world.

自1994年公司成立以来，EControls一直致力于为发动机制造商提供发动机整机控制系统的解决方案，EControls在发动机整机控制系统的设计、技术和制造领域一直处于世界领先水平。我们的客户涵盖全球众多知名的发动机制造厂商。他们将我们的系统广泛应用于商用车、叉车、发电设备和非道路市场。我们和客户一起致力于为市场提供成熟的产品、尖端的技术和完善的发动机控制解决方案。

在发动机系统的解决方案和整合方面---请相信我们的专业水平。

#### 开拓创新

在与客户合作的过程中，我们了解到客户具体的应用需求，并相应的为其提供精心调试的整合系统。该系统能帮助发动机制造商为其客户提供功能先进、性能优化、质量可靠的产品。

#### 顾客至上

我们以解决方案为基础的工作模式使我们能够满足客户在发动机和应用控制方面所有的需求。通过与客户的紧密合作，使我们能准确的掌握客户的应用需求，并据此设计出一整套系统来满足客户的需要。客户不需要对每个零部件制定规格，我们为您量身设计整套系统。

#### 绿色环保

排放法规因市场的不同而有所差异，且这些标准变得越来越严苛。EControls致力于为客户提供满足排放且高效的产品。我们公司的点燃式发动机控制系统能够显著减排，使我们的客户以最低的总体成本满足甚至超过国际法规的要求，同时最大限度地保护环境。

#### 布局全球

我们就在客户身边。

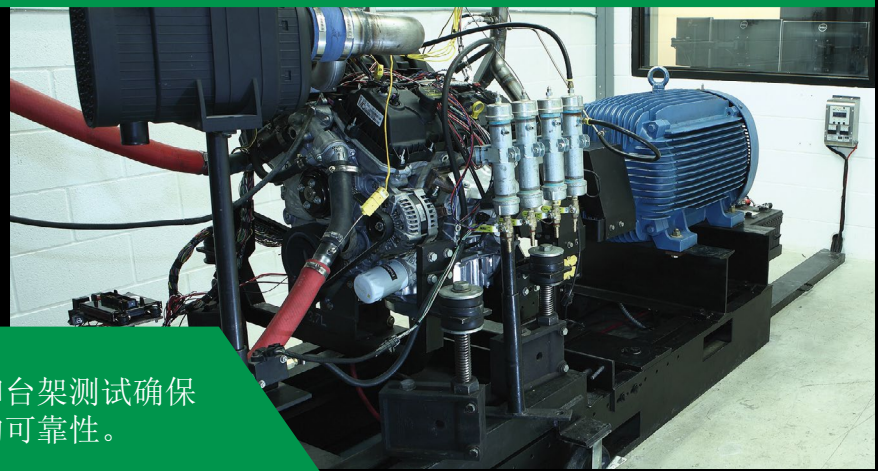
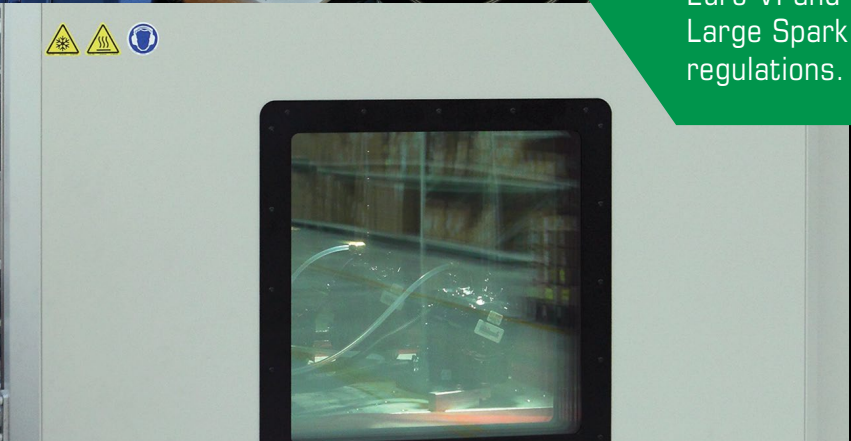
在北美地区，我们的生产基地主要设在德克萨斯州圣安东尼奥市，另外，我们还在俄克拉荷马州塔尔萨市和德克萨斯州罗森伯格市设有办事处。中国杭州工厂专门用于服务亚洲客户。我们还有英国的办事处专门针对欧洲市场。公司还在印度、韩国和拉丁美洲设置了全球销售办事处。公司还有众多的经销商为客户服务，经销商网络已遍布全球。





World-class engine calibration facilities allow us to calibrate to Euro VI and USA EPA 2010 and Large Spark Ignition emission regulations.

依托于世界领先水平的发动机台架标定设备，可进行满足欧六和美国EPA2010排放法规的发动机项目的标定开发。



Extensive component and on-engine dynamometer testing ensures products function properly and provide long-lasting reliability.

大量的部件测试和台架测试确保产品性能和稳定的可靠性。



State-of-the-art manufacturing capabilities allow us to provide world-class quality products and quickly customize for specific customer requirements.

最先进的制造能力为客户提供质量一流的产品，并且可以根据客户的特定需求提供快速的定制化服务。





### Base Engine Consultation and Design

Our breadth of knowledge allows us to offer base engine development and design services for combustion chambers, ignition systems, cam shafts, turbocharger matching, intake and exhaust manifolds, EGR sub-systems and catalysts. We take pride in our ability to work with engine manufacturers to implement design modifications to a base diesel or gasoline engine allowing them to operate on natural gas, LPG and gasoline.

### Engine Calibration

Our dynamometer facilities are world class. With these facilities, our technicians and engineers can quickly install our engine control system, instrument the engine, complete the engine calibration and perform the required emission testing. The value to our customer is speed to market with an engine that performs optimally in regard to emissions, power and efficiency.

### Engine Control Systems

Our engine control systems have been designed, tested and proven countless times in the field across a multitude of applications around the world. We are the industry leaders in the emission-regulated markets. Our continuous flow fuel control valves along with our model-based engine control modules allow our customers to reduce engine-out emissions, improve fuel economy and eliminate any concerns regarding contaminated or poor quality fuel.

### Quality and Technical Support

EControls has implemented a Global Operating System focused around Lean Six Sigma to identify and remove variables in our manufacturing and business processes. By pinpointing areas of improvement, we are able to provide our customers with faster delivery time and higher quality products. To better serve our customers, we also offer 24-hour customer service support and an in-house technical service department to answer all of your questions.

#### 发动机的咨询和设计

得益于渊博的发动机专业知识，使我们能为客户提供发动机本体开发及设计咨询服务，包括燃烧室设计、点火系统推荐、凸轮轴设计、增压器匹配、进排气管设计、EGR系统设计和催化剂选型。我们引以为傲的是通过与发动机制造商合作，我们可以将基础的柴油或汽油发动机进行设计变更，使之适用于天然气和液化石油气等更清洁的燃料。

#### 发动机标定

依托于世界领先水平的发动机台架设备，我们的技术人员和工程师能够快速进行发动机控制系统的安装布置、发动机标定和排放测试。对于客户来说，其价值在于他们能以排放更低、动力更强、效率更高的产品迅速抢占市场先机。

#### 发动机控制系统

在全世界范围内，通过不计其数的实地应用，我们的发动机控制系统已经被无数次的测试和验证。我们在排放控制方面处于行业领先水平。我们先进的连续流燃料控制阀，配合基于模块设计的发动机控制单元，可以有效减少尾气排放、改善燃料经济性，并消除客户对不清洁或质量不佳的燃料的顾虑。

#### 质量和技术支持

EControls实行的是精益六西格玛全球营运系统，通过该系统EControls可以在生产流程和业务流程中及时识别和消除失效件。通过准确的找出改进方向，我们可以以更快的速度为客户提供更优质的产品。为了更好的服务客户，我们提供24小时的客服支持和驻厂技术服务随时为您解答各种疑问。

# Commercial Vehicle/Heavy-Duty On-Road Systems

## 商用车/重载道路系统



Continuous Flow Valve (CFV)  
连续流量控制阀 (CFV)

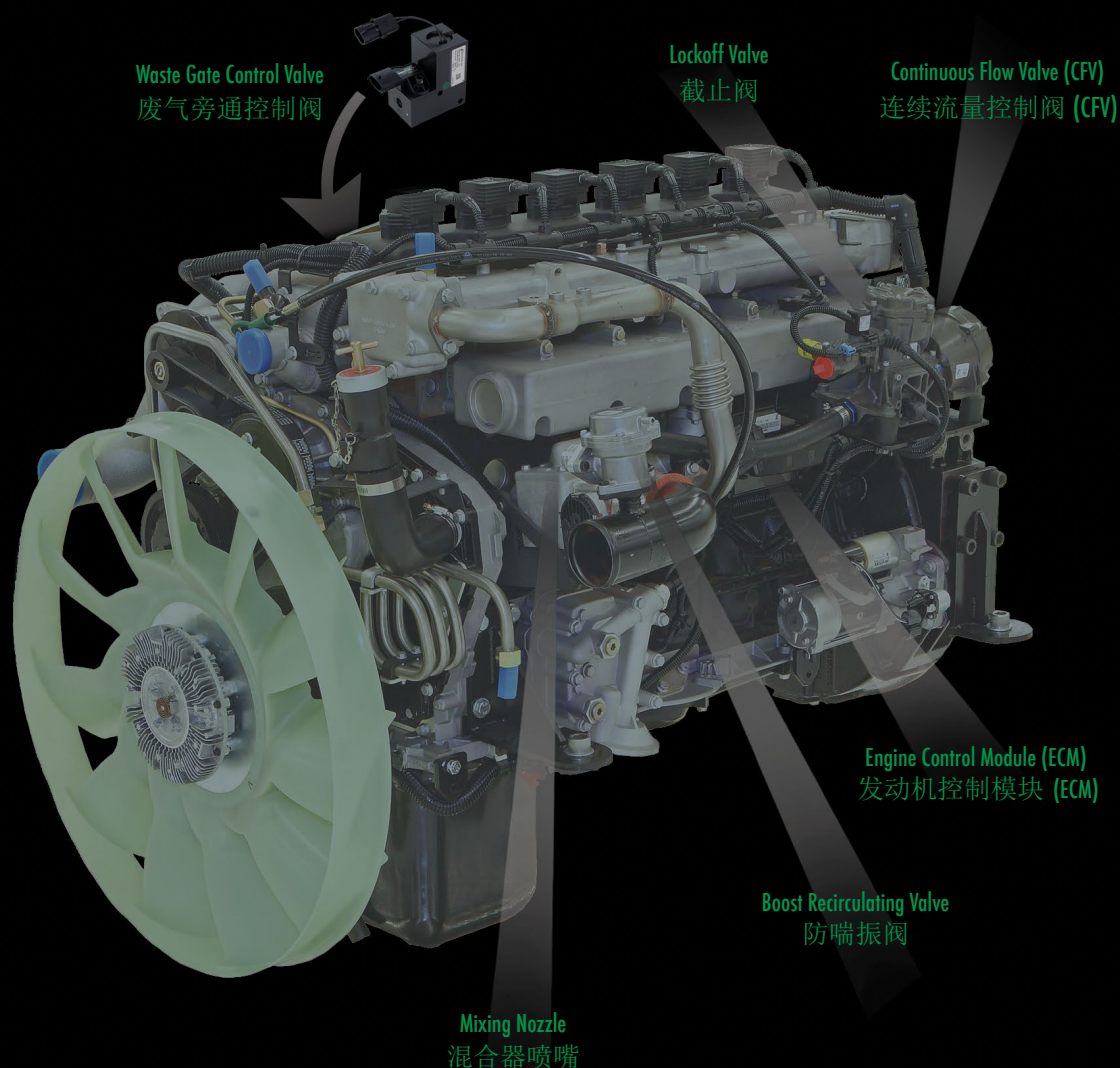


Engine Control Module (ECM)  
发动机控制模块 (ECM)



Lockoff Valve  
截止阀

# Commercial Vehicle/Heavy-Duty On-Road Systems 商用车/重载道路系统



Waste Gate Control Valve  
废气旁通控制阀



Mixing Nozzle  
混合器喷嘴



Boost Recirculating Valve  
防喘振阀



Sensors  
传感器



# Industrial Mobile Equipment Systems

## 工业移动设备系统



**Spark-ignited Engine  
Control Module (ECM)**  
点燃式发动机控制模块  
(ECM)



**Diesel Engine  
Control Module (ECM)**  
柴油发动机控制模块  
(ECM)



**Mixer**  
混合器



**Direct Acting Electronic  
Pressure Regulator (DEPR)**  
直接作用式电子压力调节器  
(DERP)



**Electronic  
Throttle Body**  
电子节气门

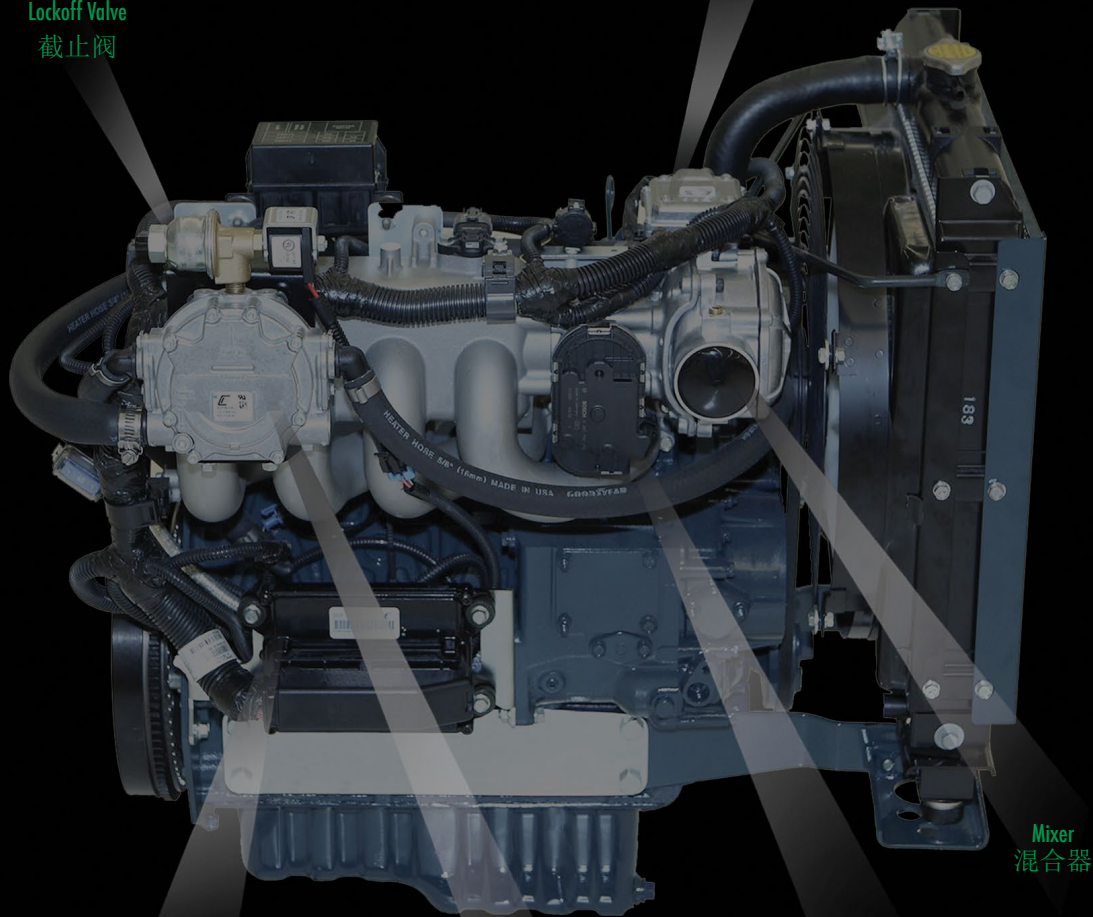


# Industrial Stationary Equipment Systems

## 工业移动设备系统

Fuel Control Valve (DEPR or IEPR), DEPR shown  
燃料控制阀(DEPR或者IEPR), 以下展示为DEPR

Lockoff Valve  
截止阀



Engine Control Module (ECM)  
发动机控制模块 (ECM)

Electronic Throttle Body  
电子节气门

LD Dual Stage Regulator  
轻载双级压力调节器

Mixer  
混合器



Lockoff Valve  
截止阀



Integrated ECM  
and DEPR (IEPR)  
ECM和DEPR整合模块  
(IEPR)



Light-Duty Dual Stage  
Regulator (LD DSR)  
轻载双级压力调节器  
(LD DSR)



Catalyst  
催化器



Harness  
线束

# ENGINE CONTROLS 发动机控制



90-pin Spark-Ignited ECM  
90针脚点燃式发动机控制模块

## Engine Control Modules 发动机控制模块

We offer a complete suite of Engine Control Modules (ECMs) for OEM applications in heavy-duty truck and bus, industrial mobile, industrial stationary and off-road segments.

我们提供完整的发动机控制模块(ECMs)用于重载卡车和客车、工业移动和固定设备和非道路领域。

EControls' Full Authority Engine Control Modules feature 12 or 24V operation. They are engine-mountable and come in a variety of pin configurations from 23 to 180. Each ECM is sealed to the environment and designed to handle all engine and engine-related inputs and outputs. We have proven model-based control algorithms, enabling reduced development time and improved performance.

EControls的发动机控制模块适用于12V或24V的操作环境，拥有从23个针脚到180个针脚的不同配置，可以安装在发动机上。所有控制模块都采用密封设计并能够控制发动机自身及与其相关的所有输入与输出。基于模型的控制算法，经实地验证能够缩短开发周期和获得更好的性能。

For flexibility, we design and manufacture the PCBAs and write the embedded code, application code and display code, which allows us to tailor the engine control module to specific customer requirements. Custom software algorithms are added quickly for hardware optimized to our customers' application. Our ECM serves both as a development platform and the production platform. The ECM software comes with comprehensive diagnostics to meet regulatory on-board diagnostics requirements.

灵活性方面，我们设计和生产电路板，并且能根据不同客户的需要嵌入程序码、应用代码和显示代码。定制的软件算法可以快速安装到硬件上，从而达到优化客户应用的目的。我们的ECM既适用于开发平台也适用于生产平台。我们的ECM配有全面的诊断程式，可以满足标准OBD的要求。

These Engine Control Modules are available for spark-ignited and diesel common rail engines.

这些发动机控制模块适用于点燃式发动机和共轨柴油发动机。



120-pin Spark-Ignited ECM  
120针脚点燃式发动机控制模块



120-pin Diesel ECM  
120针脚柴油发动机控制模块



180-pin Diesel ECM  
180针脚柴油发动机控制模块



## FUEL CONTROLS 燃油控制

### Continuous Flow Valve

The CFV precisely meters the amount of fuel to the engine based on the engine torque demanded. The fuel flows in a controlled continuous stream; this with its accuracy results in optimum combustion and is proven to yield excellent fuel economy, minimized engine out emissions and diesel-like transient response. It features durability that is far superior to traditional injectors and is unaffected by contaminants in CNG or the low lubricity and potential low pressure found with LNG.



### 连续流量控制阀

CFV可以根据发动机的扭矩要求精确控制进入发动机的燃料量。在CFV中，燃料流是受控制的、连续的，通过对燃料流量的控制可以实现最优燃烧，从而达到提高燃油燃烧效率和减少发动机排放的目的，CFV系统也拥有可媲美柴油发动机的瞬态响应。相对于传统的喷射系统，CFV系统具有更好的耐久性，不易受压缩天然气中的污染物影响，解决液化天然气润滑性差、压力低的问题。

### Electronic Pressure Regulator

The EPR is designed to regulate either natural gas, CNG or LPG precisely to a variable venturi mixer. Like the CFV, it presents a controlled continuous flow of fuel to the engine. It has proven to be durable and reliable in the field having the ability to handle the contaminants found in LPG and is particularly well-suited to operate with low pressure natural gas.



### 电子压力调节器

我们的电子压力调节器可以精确控制进入文丘里混合器中的天然气、压缩天然气或者液化石油气的流量。就像CFV一样，进入发动机中的燃料流是受控制的、连续的。经过实地验证，EPR系统耐用可靠，不易受液化石油气中的污染物影响，特别适合使用低压天然气。

## REGULATORS 调节器

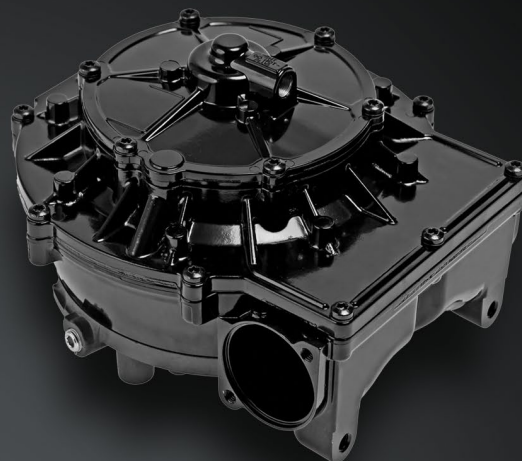


### Light-Duty Dual Stage Regulator

The LD DSR is a fully mechanical two stage vaporizing regulator used to present the LPG or natural gas to the EPR. The superior heat exchanger improves low ambient temperature performance, and the highly engineered pressure relief system, seals and diaphragms offer superior durability.

### 轻载双级调节器

轻载双级调节器是一台全机械式双级汽化调节器，它用于将液化石油气或者天然气导入到电子压力调节器中，它较好的热交换装置改善了在低环境温度下的性能。并且，精心设计的减压系统、密封圈和膜片赋予轻载双级调节器更好的耐用性。



### Heavy-Duty Dual Stage Regulator

The Heavy-Duty Dual Stage Regulator is used across a multitude of applications from industrial stationary to on-highway. With highly engineered rugged components, it's designed for extreme durability.

### 重载双级调节器

重载双级调节器被广泛使用于工业固定设备和公路车辆中。由于使用精心设计的坚固耐用部件，它的耐用性更加卓越。



E900 Mixer  
E900 混合器

E330 Mixer  
E330 混合器

## MIXERS 混合器

### Mixers

Multiple mixers are available for a wide range of engine sizes for LPG, natural gas and bi-fuel applications. The mixer is incorporated in EControls EPR systems and can be used in either open or closed loop applications. Its superior low flow resolution and repeatability eliminate idle adjustment, is resistant to backfire and provides excellent air/fuel ratio accuracy.

### 混合器

多种型号的混合器能够满足各种液化石油气、天然气和双燃料的发动机应用。混合器是EControls EPR系统的组成部分，它适用于开环或闭环应用。它在低流量工况下的控制精度和重复性可以消除怠速调整，有效抑制回火，并且可以提供高度准确的空燃比控制精度。



## VALVES & SENSORS 控制阀和传感器



### Lockoff Valve

Our Lockoff Valve is used in commercial vehicle and industrial mobile applications. It is designed for extreme durability, including a design target of 500,000 cycles with a temperature cycle profile of -40° to 125° C. It is suitable for LPG, LNG and CNG fuel systems.

### 截止阀

我们的截止阀被广泛应用于商用车和工业移动应用。它采用了高耐久性的设计，能够在-40° 到 125° C温度区间内循环使用500,000次。此款截止阀适合液化石油气、液化天然气和压缩天然气系统使用。



### Waste Gate Control Valve

Utilized in commercial vehicle applications, our Waste Gate Control Valve allows full-authority electronic control of pneumatically waste gated turbos. Our unique proportional control strategy extends the durability of the turbo waste gate. With an on-board sensor added, it yields superior engine response and vehicle drivability.

### 废气旁通控制阀

此款废气门旁通阀适用于商用车，可以对废气涡轮增压系统进行电控，我们独特的比例控制策略会提高涡轮废气旁通阀的耐久性。废气旁通阀和车载传感器配合使用，可以有效提高发动机的响应速度和车辆的驾驶性能。



### Boost Recirculation Valve

Our Boost Recirculation Valve is designed to be extremely durable. It is a normally closed valve that opens to allow the high pressure downstream of the turbocharger to recirculate back into the intake air stream and ultimately prevent accelerated wear and fatigue on the turbocharger components.

### 防喘振阀

我司研发的防喘振阀具有极强的耐用性。此阀通常处于关闭状态，当增压器下游压力过高时，此阀门打开，将下游的高压气体导回进气道，从而从根本上避免涡轮增压零部件的过快磨损和疲劳失效。



EnviroTech™ Sensor  
环境温湿度传感器

### Sensors

Among a wide range of sensors, our EnviroTech™ sensor is suitable for real-time engine control applications. It measures humidity allowing for optimized combustion. Sensor output can be used for general information or to correct engine control parameters and the UEGO sensor output.

Our sensor options used as part of the system include: Wide-band and stoichiometric oxygen sensors; knock sensors; pressure sensors; temperature sensors; and cam and crank speed sensors.

### 传感器

在一系列的传感器中，环境温湿度传感器适用于发动机实时控制应用。它可以检测空气中的湿度以达到最优化燃烧。传感器的输出可以被用做基本信息或者用于修正发动机控制参数和氧传感器输出。

我司提供的用于系统上的传感器包括：宽域和开关型氧传感器、爆震传感器、压力传感器、温度传感器、凸轮轴和曲轴位置传感器和转速传感器。

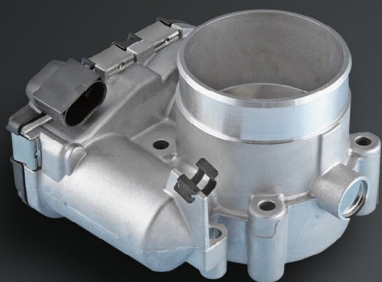
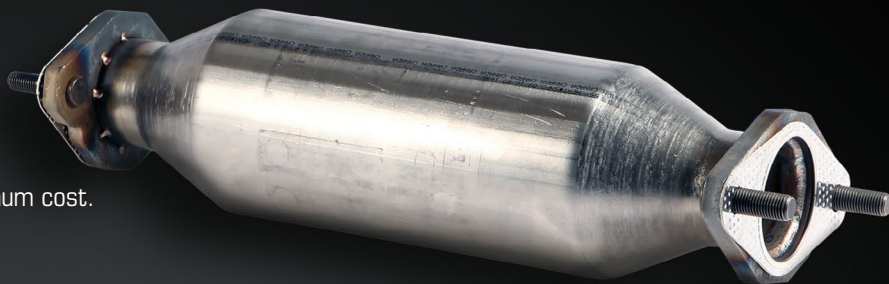
## OTHER PRODUCTS

### Catalyst

EControls developed its own catalyst formulation to optimize precious metal loading. This custom catalyst provides optimized performance at minimum cost.

### 催化器

EControls自己研发了催化器计算模型来优化贵金属含量。这种特制的催化器成本低、效果好。



### Electronic Throttle Body

The Electronic Throttle Body enables high performance speed governing with proven durability and reliability.

### 电子节气门

电子节气门可以使发动机调速出色，并且使发动机具有高耐久性和可靠性。



### Wire Harnesses

The right selection of wire gauge, connectors, shielding, ground points and relays are key to the success of the wire harness. We have been designing harnesses as long as we have been designing controllers. This ensures that we have the ability to offer our customers total control of the system, from component to ECM.

### 线束

正确选择合适的电线规格、接插件、屏蔽装置、接地点和继电器对于一款线束至关重要。我司从设计控制器开始就着手设计线束，长期的设计经验使我们具备为客户提供从部件到整套电子控制系统的实力。



### Power Distribution Module

EControls' Power Distribution Module (PDM) expands CAN bus control networks by replacing existing relay and fuse boxes with more reliable solid-state switches. It is designed for use in 12-24V systems and supports CAN J1939 communications, allowing users to remotely monitor and configure inputs and outputs.

### 配电模块

EControls的电源分配模块 (PDM) 通过使用可靠性更强的固态开关代替继电器和保险丝盒的方式扩展了CAN总线控制网络。此配电模块适用于12-24V 的操作环境，支持CAN J1939通信技术，允许客户远程监控和设置输入和输出。



### ECOM Cable

The ECOM cable is a USB 2.0 device that allows Control Area Network (CAN) traffic to be transmitted and received using a computer. It was originally designed by EControls to provide a CAN interface for our OEM customers to communicate with our engine control modules.

### 诊断线束

此款诊断线束是一款 USB 2.0 设备，使用该线束可以使控制器局域网 (CAN) 和电脑进行数据交换。此款检测线束原本是为我司OEM 客户提供CAN端口用来连接我们的发动机控制模块而研发。





Enovation Controls, LLC is a global provider of innovative, state-of-the-art products and services for comprehensive engine-driven equipment management and control solutions. Enovation Controls is the company formed from the merger of FW Murphy and EControls in 2009. The company combines FW Murphy's full line of engine instrumentation products with EControl's extensive engine control development, expertise to provide customers with a complete solution approach for engine control, protection and monitoring. Enovation Controls' headquarters is located in Tulsa, Oklahoma. Its complete portfolio of brands include: Murphy, EControls, Computronic Controls and Zero Off.

Enovation Controls, LLC 是一家全球性的供应商，为发动机驱动设备管理和控制解决方案提供创新的及最先进的产品和服务。它于2009年通过合并FW Murphy 和EControls两个公司而建成。Enovation Controls集合FW Murphy 所有发动机仪器仪表产品和EControl在发动机控制研发方面的广泛经验，为客户提供专业的整套发动机控制、防护和监测方案。Enovation Controls总部坐落于美国俄克拉荷马州塔尔萨市。旗下品牌包括：Murphy、EControls、Computronic Controls 和 Zero Off。



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