

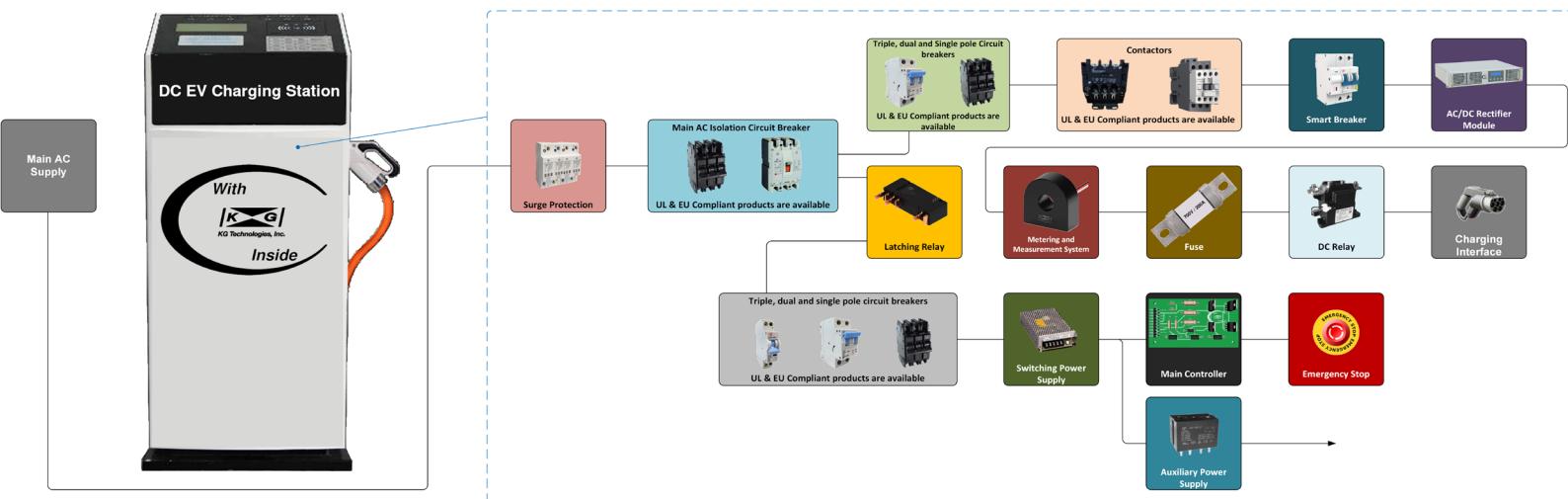
EV Charging Applications Guide (DC)

By KG's Business Development Team

KG Relays, Smart Circuit Breakers and Contactors are excellent choices of components for EV charging systems. KG also offers metering and monitoring solutions for commercial charging systems.

As electric vehicles continue to gain mainstream adoption, a robust charging infrastructure becomes vital to the electric transportation system. Within an EV charging system, individual components interact to perform a variety of functions, each with unique requirements and strict regulations that must be considered and adhered to.

The intention of this application guide is to introduce the various product lines that KG Technologies offers support to many of these critical functions within an EV charging system.



EV Charging Pole Flow Chart (DC)

	<h3>Main AC Supply</h3> <p>Main AC supply originates from the Utility Energy provider. Typical Voltages on AC Mains can be anywhere in the range from 120VAC-277VAC for Single Phase applications. Multiple Phase configurations are used where higher power requirements are needed and operating Voltages will be in the 380VAC and upwards range.</p>
	<h3>Surge Protection</h3> <p>KG offers surge protection products that will provide protection against voltage spikes on the Main AC supply. They are a key component in protecting sensitive electronic equipment. Refer to KG's part number UES5.</p>
	<h3>Main AC Isolation Circuit Breakers</h3> <p>These Circuit breakers provide a safe means to connect and disconnect the entire EV charger from AC Mains. They may also contain Earth Leakage Protection devices that will trip under leakage current conditions.</p> <p>KG offers circuit breakers for the USA (UEB1) and International (UEBL) standards.</p>
	<h3>Triple, Dual and Single Pole Circuit Breakers</h3> <p>KG's circuit breakers are typically used to isolate individual circuits and components. They are part of the distribution system and are key to the safe operation of components. These breakers will trip under excessive current drain through them and are used to protect cables and equipment.</p> <p>KG offers single-pole to multi-pole circuit breakers for the USA and International Standards.</p>
	<h3>Latching Relay</h3> <p>KG Latching Relays are mainly used for switching Alternating Current (AC). They provide highly efficient switching and are very reliable. In this application a latching relay will be used to deactivate and Isolate the branch circuit that powers the Main controller. This is particularly useful in the event of faulty circuit breakers that may need replacement.</p> <p>Visit https://kgtechnologies.net/products#latching-relays for more information on KG's latching relays.</p>

	<p>Metering and Measurement System</p> <p>Smart Meters are used to monitor the amount of energy that flows through it and to keep track of the amount of energy that is consumed by the electrical circuit that is connected to it. Utility providers use these meters as a means to invoice a customer for the amount of energy that the customer used, usually on a monthly basis. KG's CT's are the perfect solution for monitoring and measuring the Smart Meters.</p> <p>Visit https://kgtechnologies.net/products#current-transformers for more information on KG's CT's.</p>
	<p>Contactors</p> <p>Using KG Contactors as a safety device in this application. If a control circuit activates the Contactor, it relays power to components that draws a significant amount of current. In the event that the control circuit deactivates the Contactor, the contactor disengages and opens up the electrical circuit and disconnects the equipment from the power feed. Any fault in equipment, AC brown out condition or excessive current draw from the system that is sensed to be outside the safe operating parameters of the AC Charging system, will cause the sensing circuit to open this contactor to prevent charging if conditions are not optimal.</p> <p>KG offers an International Version (USC1) for and a USA Version (XMCO).</p>
	<p>Smart Breaker</p> <p>A Smart Circuit breaker is primarily used to monitor the amount of energy that flows through the breaker. The data obtained from the smart breaker can be used to calculate efficiency of AC to DC Rectifiers and to determine the losses experienced. A Smart Circuit breaker also allows the breaker to be remotely turned off or on, based on a specific instruction set of parameters programmed in the main controller. (In the event where the Emergency Stop button is activated, this smart circuit breaker will switch off the rectifier modules). KG offers single-pole to three-pole variances.</p>
	<p>AC/DC Rectifiers</p> <p>AC/DC Rectifiers are amazing pieces of equipment. Their main function is to change Alternating Current (AC) to Direct Current (DC). As a stable DC output is needed from the rectifier output to charge batteries, these rectifier modules are designed to have high efficiency and low ripple output.</p>

	<p>DC Meter</p> <p>A DC meter is primarily used to keep track of the amount of energy that is consumed from the DC Source (Rectifier System). The data obtained from the DC meter is used to determine maintenance schedules of rectifier components and to make sure that DC Voltages remain constant and correlate to EV manufacturer charging specifications. DC Meters contain CT's that are used to measure current through the meter.</p>
	<p>Fuse</p> <p>A Fuse is used as a protection device in the event of a short circuit or in the event of excessive current being drawn from the Rectifier System. If a fuse is blown, it permanently deactivates DC output to the DC relay and EV Charging interface. Fuses need to be manually replaced, following a thorough investigation of all EV components to make sure the entire system is safe.</p>
	<p>DC Relay</p> <p>The DC Relay acts as a safety device to activate and deactivate DC output to the charging interface. As these voltages can be in excess of 600V, it is a key safety feature and will only activate charging once the charging interface has been securely connected to the vehicle. When the charging cycle completes, the DC relay deactivates DC output to the Charging interface. KG offers miniature high-power relays for this application.</p>
	<p>Charging Interface</p> <p>The charging interface connects the EV Charger to the EV. It provides a safe means for the user to connect the EV charger to the charging circuitry and vehicle. Contained within the handle is an electromagnet and a relay that locks the charging interface into the receptacle of the vehicle once charging is activated. Unless the emergency stop on the EV charger is activated. The charging interface cannot be disconnected from the EV vehicle.</p> <p>KG offers many variations of relays including miniature high-power relays.</p>



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	<p>Switching Power Supply</p> <p>The Switching Power Supply is used to provide a lower and Stable DC Voltage from the Main AC Supply. These power supplies provide power to control systems. Switch mode power supplies are rarely rated to deliver more than 10A at the rated DC Voltage. KG can supply relays and CT's for your switching power supply.</p> <p>Visit KG's product page at: https://kgtechnologies.net/products</p>
	<p>Main Controller</p> <p>The Main Controller in this application performs all the logical functions of the system. It is typically the “brain” of the entire EV Charging system. It can be programmed to perform an array of functions, from simply activating and deactivating the courtesy lights to regulating voltage and charge current. It is the single most critical component in the EV charging system. KG can supply relays and CT's for your main controller board.</p> <p>Visit KG's product page at: https://kgtechnologies.net/products</p>

Summary

KG Technologies' expertise and knowledge within EV Charging make us an ideal partner for new or existing EV Charging projects. Our comprehensive product portfolio is a first choice to support all your energy management needs and our product experts will help you select the best product fit for your application. As a Hongfa group company we offer quality and capacity at a competitive price and our diverse portfolio of energy management products can help consolidate your supplier base further allowing your business to scale. To learn more about our products or discuss a specific application please email our product specialists at techinfo@kgtechnologies.net or visit our website at kgtechnologies.net.



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