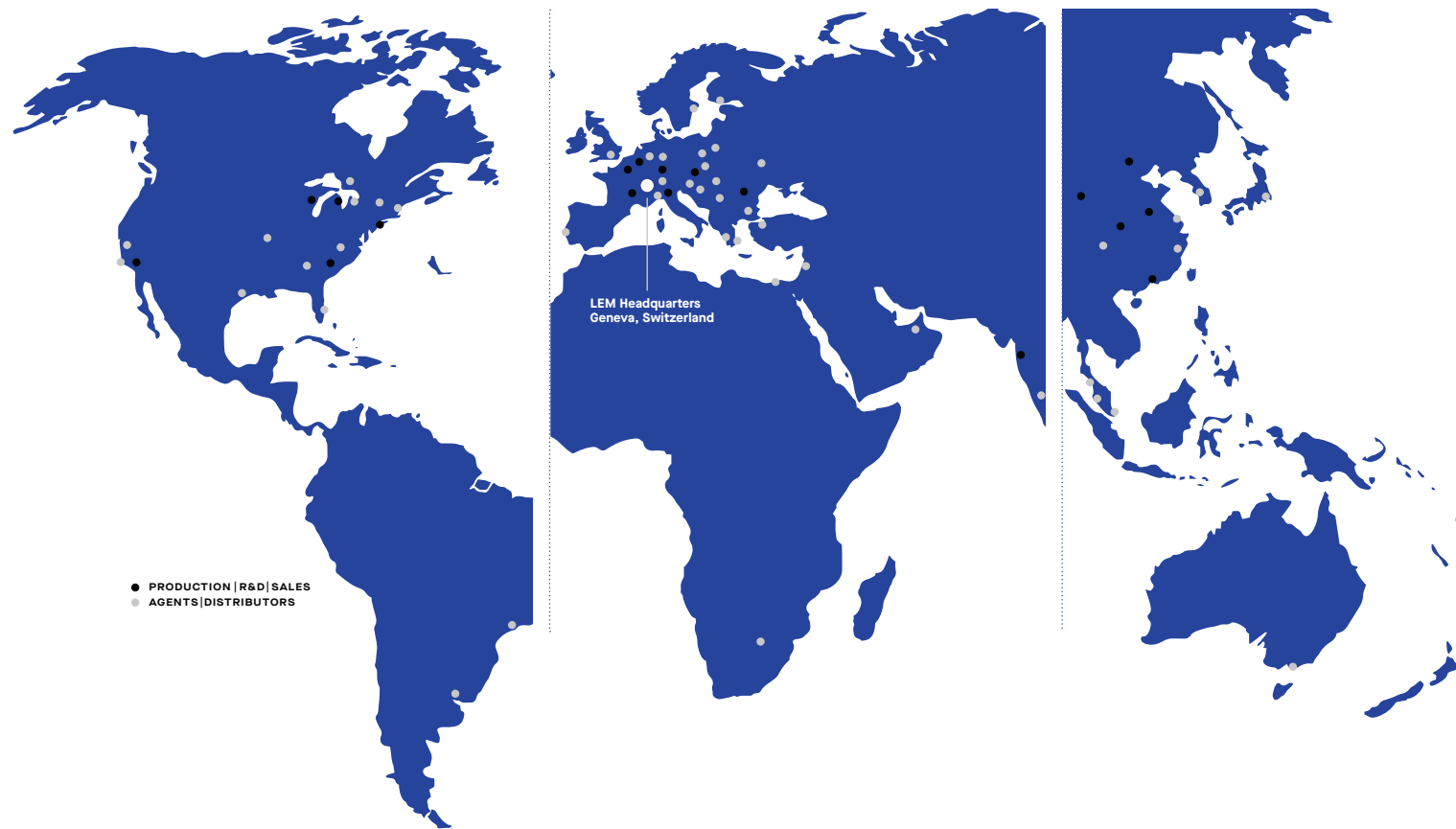


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LEM

Life Energy Motion

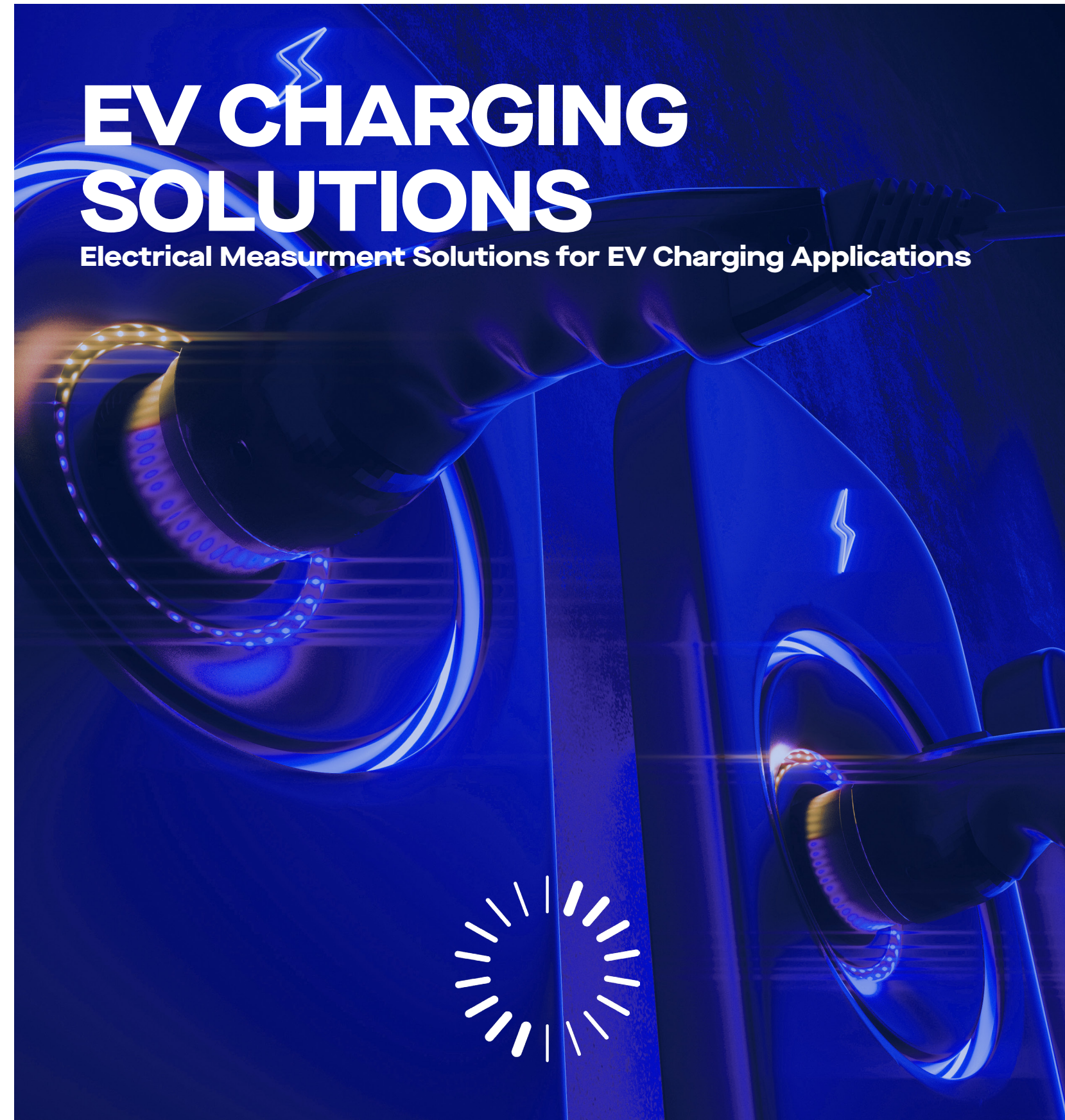


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Life Energy Motion

EV CHARGING SOLUTIONS

Electrical Measurement Solutions for EV Charging Applications



EV Charging Solutions

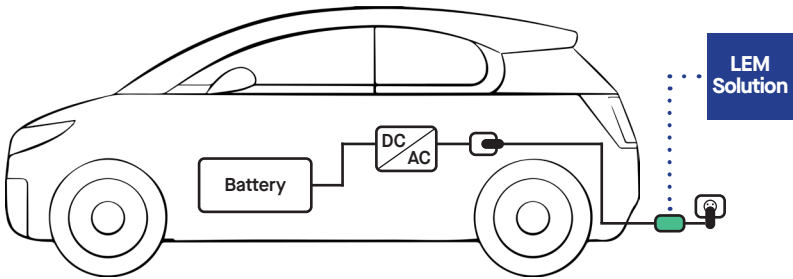
One of the biggest challenges the 21st century faces is the decarbonization of traditional transportation, which is accountable for over 25% of global CO2 emissions. With a fleet of 157 million EVs expected by 2030, electric vehicle supply equipment needs to grow in parallel without sacrificing the convenience consumers have come to expect. LEM actively contributes to the deployment of electric vehicle charging stations, by supplying cutting edge technology sensors and meters ensuring charging stations are more affordable, safer, smarter, and reliable.

AC Charging

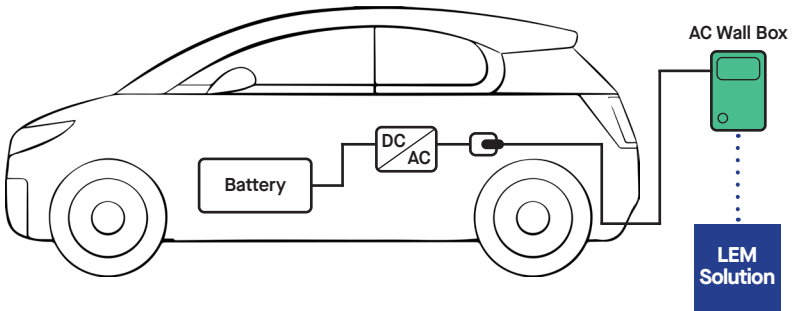
AC charging is the process of charging an EV by converting alternating current power from the grid into DC power that can be stored in the vehicle's battery. This conversion is done by the vehicle's onboard charger, which is usually integrated into the EV's charging system. This is the most common and easily accessible method of charging EVs at home, workplaces, and public charging stations.

There are different levels of AC charging, categorized by power output, typically between 3.7 and 44 kilowatts. Level 1 Charging involves plugging the EV into a standard household electrical outlet utilizing the charging cable provided with the vehicle. This typically provides the slowest charging rate, suitable for overnight charging or topping up during the day. Level 2 Charging utilizes a higher-powered charging station, typically installed at homes, workplaces, and public charging stations. This provides faster charging rates compared to Level 1, making it more suitable for daily charging needs.

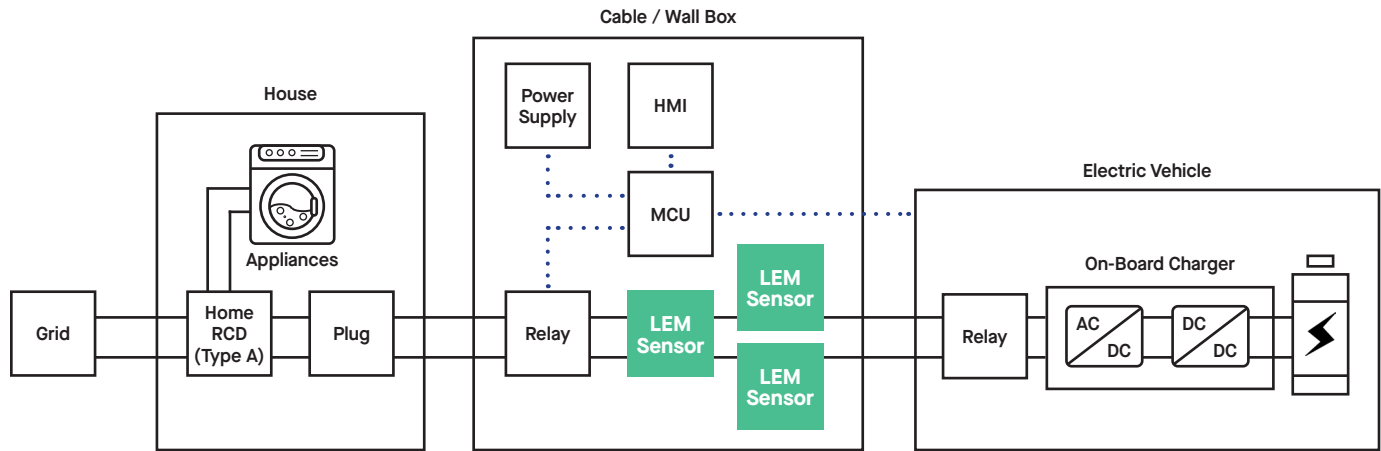
Charging Level 1



Charging Level 2

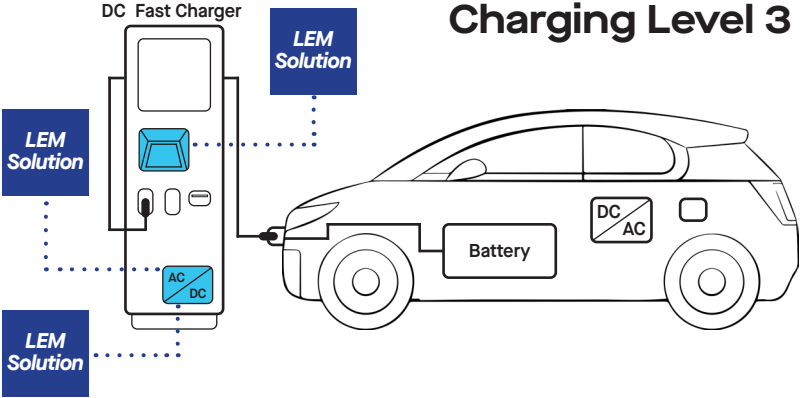


AC Cable & Wall Box:

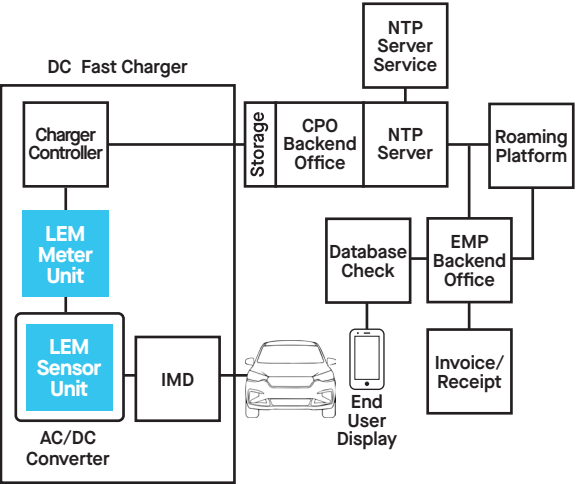


DC Charging

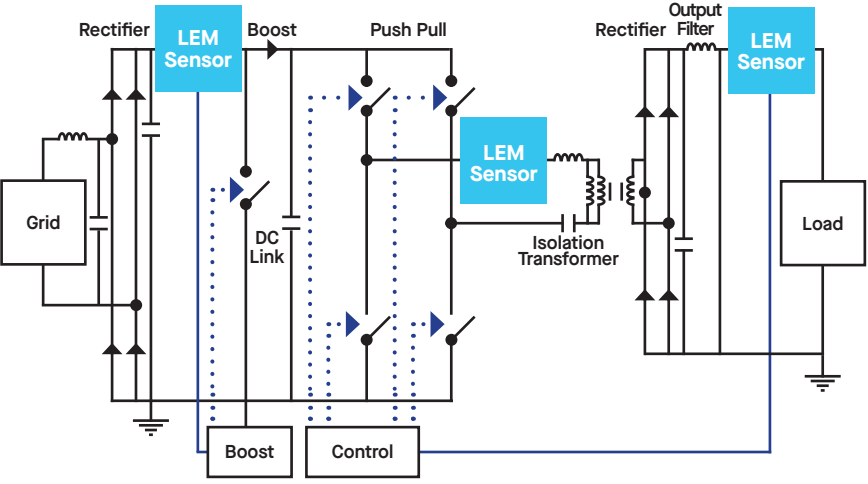
DC or Level 3 Charging is the process of charging EVs using a high-powered charging station, usually found along highways or major travel routes, that delivers direct current electricity to the vehicle's battery. Depending on the EV model and the charger's power output, it's possible to add hundreds of kilometers of range to the vehicle in just 30 minutes or less. DC charging allows EV drivers to quickly recharge their vehicles, especially during long journeys or when they need to top up their battery quickly.



DC Metering:



AC/DC Converter:



	CDSR	CDT	DCDT	DCBM 100	DCBM 400/600	HMSR-DA	HMSR SMS
Application	Leakage Detection	Leakage Detection	Leakage Detection	DC Destination Charging	DC Fast Charging	AC/DC Converter	AC/DC Converter
Bandwidth	2kHz	2kHz	100kHz	100Hz	100Hz	300kHz	300kHz
Consumption	50mA	60mA	60mA	80mA	400mA	24mA	20mA
Current Range Max	32A Per Phase +/- 150mA (leakage)	48A Per Phase +/- 300mA (leakage)	48A Per Phase +/- 300mA (leakage)	80A 1000V DC	400A & 600A 1000V DC	10A - 75A	15A - 75A
Supply Voltage	3.3V	+5V	+5V	+12, +24V DC	+12, +24V DC	3.3V - 5V	3.3V - 5V
Mounting	1 Phase - 2 Jumpers 3 Phases + N - 4 Jumpers	1 Phase - 2 Jumpers 3 Phases - 4 Jumpers	1 Phase - 2 Jumpers 3 Phases - 4 Jumpers	DIN Rail/ Screw Mounting	DIN Rail/ Screw Mounting	SMD SOIC 16	SMD SOIC 16
Output	SPI + Analog Tripping Output	SPI + Analog Tripping Output	SPI + Tripping Output	Ethernet HTTP REST	Ethernet HTTP REST	Digital	Analog
Overall Accuracy	+/- 0.5mA @ 1mA	10% @ 5mA	10% @ 5mA	Class B (1%)	Class B (1%)	1% - 3%	1% - 3%
Technology	Open Loop Fluxgate	Open Loop Fluxgate	Open Loop Fluxgate	Bi-directional Meter	Bi-directional Meter	ICS	ICS

Application	Leakage Detection	Leakage Detection	Leakage Detection	DC Destination Charging	DC Fast Charging	AC/DC Converter	AC/DC Converter
Bandwidth	2kHz	2kHz	100kHz	100Hz	100Hz	300kHz	300kHz
Consumption	50mA	60mA	60mA	80mA	400mA	24mA	20mA
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Supply Voltage	3.3V	+5V	+5V	+12, +24V DC	+12, +24V DC	3.3V - 5V	3.3V - 5V
Mounting	1 Phase - 2 Jumpers 3 Phases + N - 4 Jumpers	1 Phase - 2 Jumpers 3 Phases - 4 Jumpers	1 Phase - 2 Jumpers 3 Phases - 4 Jumpers	DIN Rail/ Screw Mounting	DIN Rail/ Screw Mounting	SMD SOIC 16	SMD SOIC 16
Output	SPI + Analog Tripping Output	SPI + Analog Tripping Output	SPI + Tripping Output	Ethernet HTTP REST	Ethernet HTTP REST	Digital	Analog
Overall Accuracy	+/- 0.5mA @ 1mA	10% @ 5mA	10% @ 5mA	Class B (1%)	Class B (1%)	1% - 3%	1% - 3%
Technology	Open Loop Fluxgate	Open Loop Fluxgate	Open Loop Fluxgate	Bi-directional Meter	Bi-directional Meter	ICS	ICS