



ELECTRICAL POWER, SUPER WI-FI, NOW ACCESSIBLE ANYWHERE

JUNE 2022

INTRODUCING TOLENOID C[®]



CHALLENGE, EXPERIENCE OUR FUTURE

Ever since the commercialization of electricity, there have been an untapped byproduct in form of electromagnetic field generated by flowing currents in power lines. By harnessing the forgotten and unused electromagnetic energy through energy recycling, Ferraris has opened a new pathway for electric power generation and electric energy recycling technology for the mankind. Ferraris products was developed in a strive to harness the power from a magnetic field produced by power lines and transform it into a reliable and countable power source.

We as human race have reached the pinnacle of modern digital age with constant influx of new and improved electronic goods to improve our everyday life. In order to increase productivity and efficiency, adequate infrastructures such as Smart farms, Smart factories and Smart cities are being constructed. To match its power consumption, solar, wind, and other renewable energy sources are being developed to meet the ever-growing electric energy demands. Even with the best efforts, the reality is that there are limitations and struggles for the renewable energy sources to meet the demands of increasing power demands.

Ferraris pondered whether decentralized power generation could be delivered to better meet the ever-increasing power demands of humanity. In order to whether such technology could be developed and be applied, Ferraris ran a case study on pumped-storage hydroelectric power stations. Ferraris extracted the Energy Recycling Reservoir concept to Pumped-storage. There are difference between ERR (Energy Recycling Reservoir) System and pumped-storage hydroelectric in their tech-methodology and operational aspects.

The basic flow of ERR System is that it harvests magnetic energy from the incoming power lines of the commercial buildings to be sent to distribution panel which store and sorts the recycled power and transmits it to building's load, which save the costs of the building's (or house) utility.

The vision of Ferraris is to mass provide ERR System at economical pricing to extend electrical energy capacity to make our vision of future come true. Ferraris wishes to provide clean energy with no environmental pollution around the world to improve and restore the environment for the benefit of current and future generations to come.

We have named Ferraris in memory of Galileo Ferraris.



INTRODUCING TECHNOLOGY

By harnessing an innovative contactless and magnetic harvesting technology, Ferraris' products enable the conversion of electromagnetic field energy produced by power lines – regardless of the power line voltage – into an electric power source. Our Power supply solution (Tolenoid C[®] and PH4IoTs) can be used anywhere with nearby power lines to supply electricity for your IoT equipment (CCTV, Super Wi-Fi, access point, and sensors) – even in the absence of transformers or outlets.



The PH4IoTs (Power harvesting for IoT sensor devices) product was developed so that customers may directly connect to an IoT sensor device with DC output; the built-in battery can be charged with the electricity generated internally from the PH4IoTs, so that customers may conveniently supply power to their IoT sensor devices. The PH4IoTs not need to replace the battery. The PH4IoTs.w can remotely monitor the magnetic harvesting power and measure the battery capacity via Wi-Fi transmission.

Our products are not current transformers but power transformers which convert magnetic energy into electric energy when near power lines, regardless of the power line voltage. Our PT is operating not only at linear region, but also at saturation region. Our products its safety standards certificated, such as UL, SEC, and KS and waterproof design (IP65–IP68). To better understand our technology, please see the video description. <https://youtu.be/Y3IR5djt5hg>

DIFFERENCES IN CONNECTING POWER SUPPLIES

Conventional way

- Transformer to get appropriate electric power - installation is complex and cost prohibitive
- Battery has limited performance & lifetime - complexity of replacing every battery in the field
- Connect the wiring from the transformer or battery or outlets to electric equipment



Electromagnetic harvesting products way

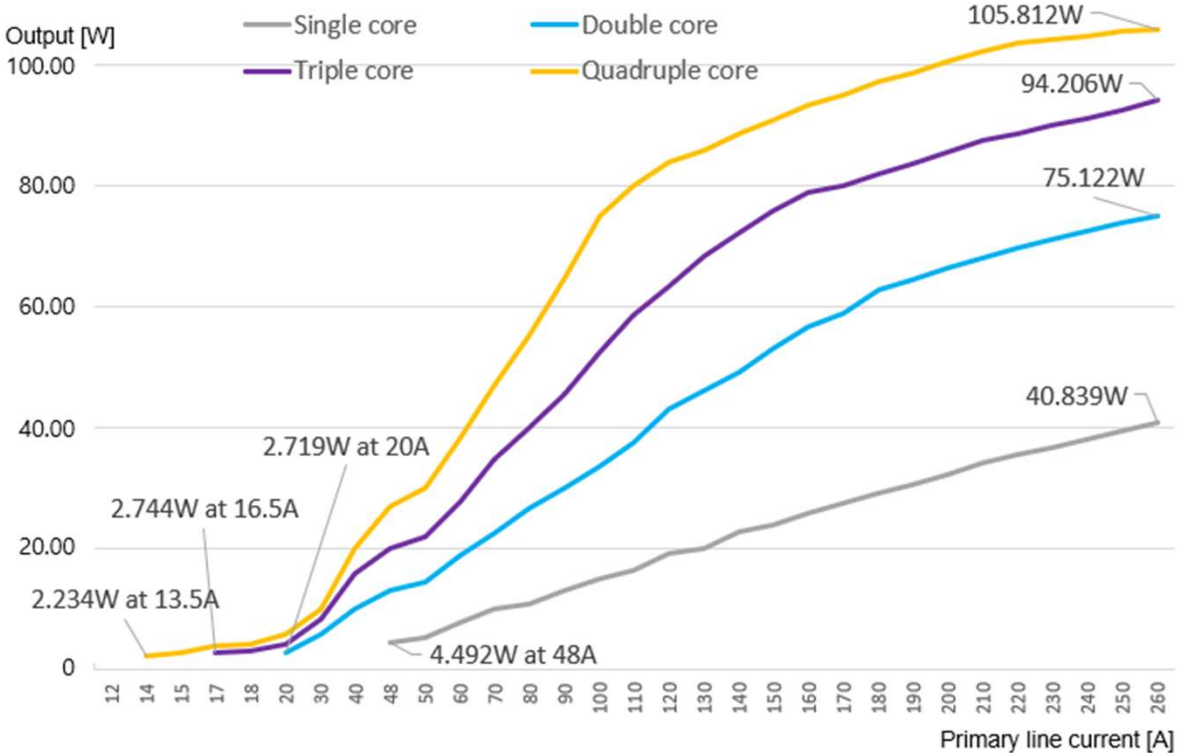
- No need transformer, battery, and outlets - Contactless
- The wiring from electromagnetic harvesting products to electric equipment - Cost saving, Easy maintenance
- Reduce accidents caused by transformer, battery, and mass wiring



LINEAR POWER SCALABILITY

Tested under Tolenoid C[®] 1.30" (1ea to 4ea) and SMPS (Switching mode power supply) 24V 60W environment.

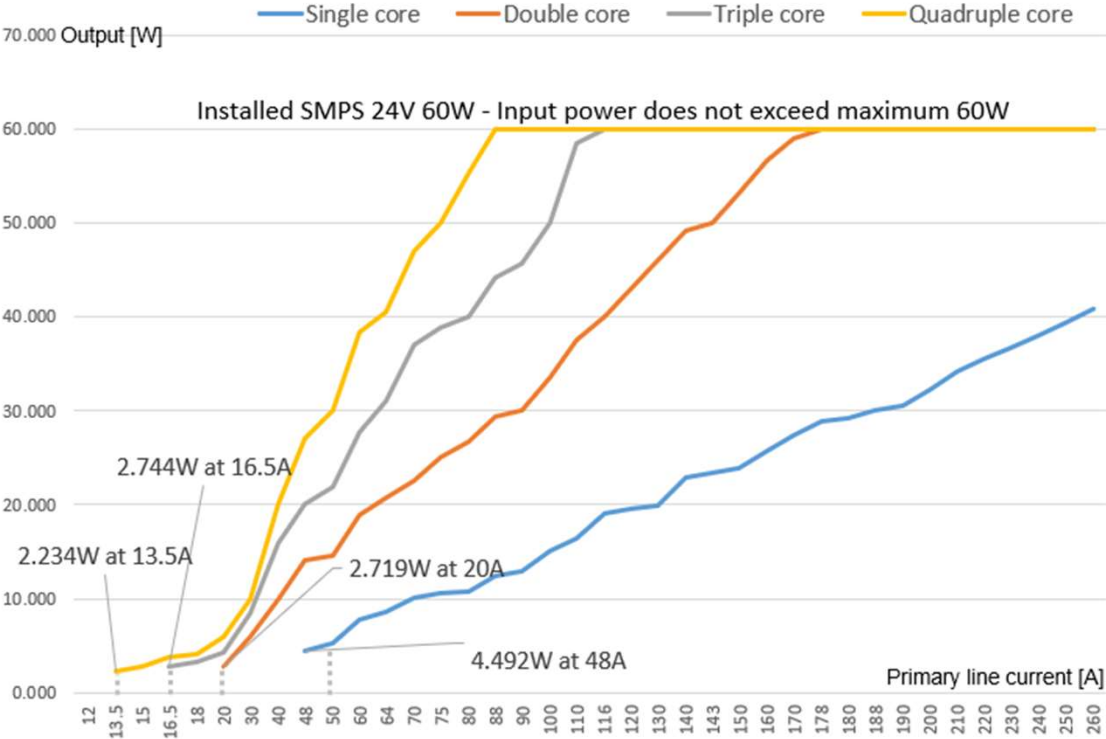
Tolenoid C[®] can produce up to desired output level by simply adding Tolenoid C[®] module step by step if incoming power line has more than enough power from the desired one.



INPUT CONTROLLABILITY

Tested under Tolenoid C[®] 1.30" (1ea to 4ea) and SMPS (Switching mode power supply) 24V 60W environment.

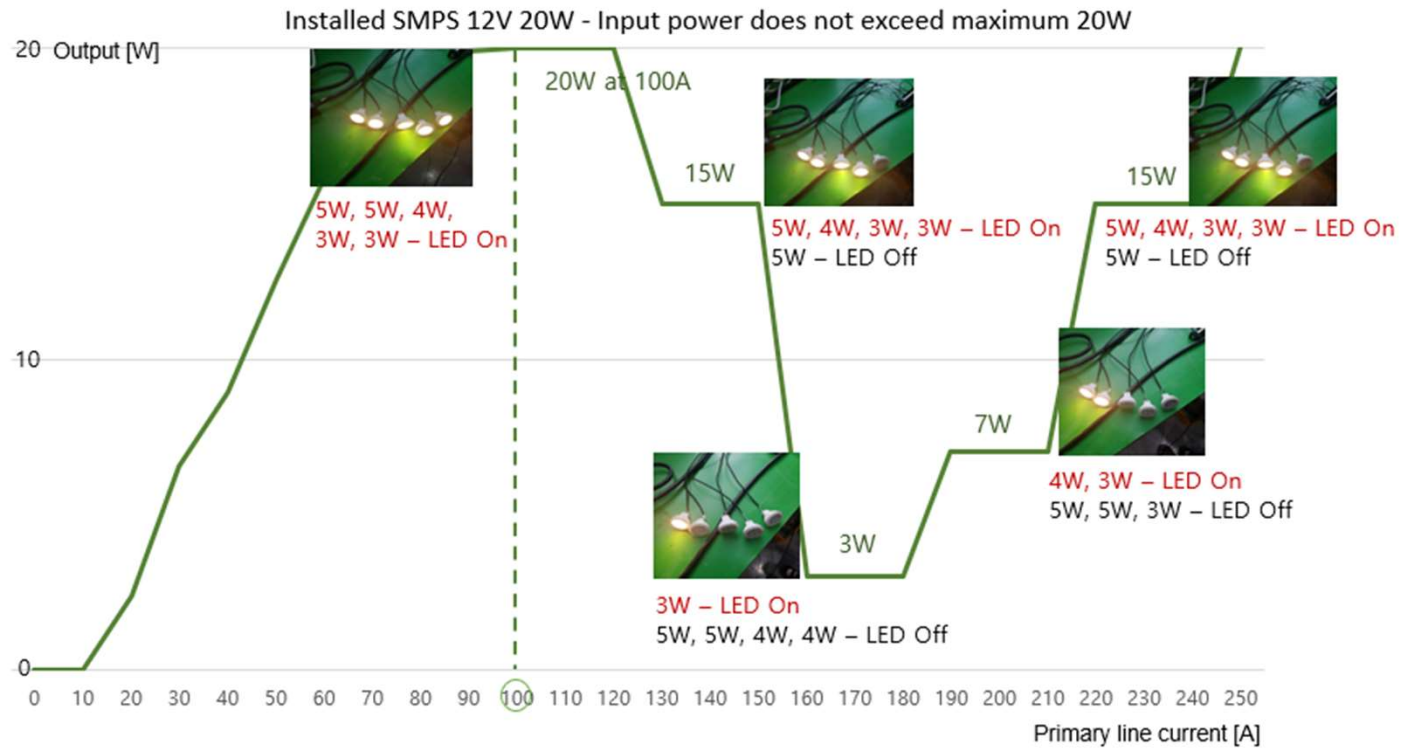
SMPS can control the maximum wattage TolenoidC[®] power generation through its logics system so that the Tolenoid C[®] produce input power does not exceed maximum desired wattage. Maximum wattage can be set by the user.



OUTPUT LOAD VARIATION - TRACEABILITY

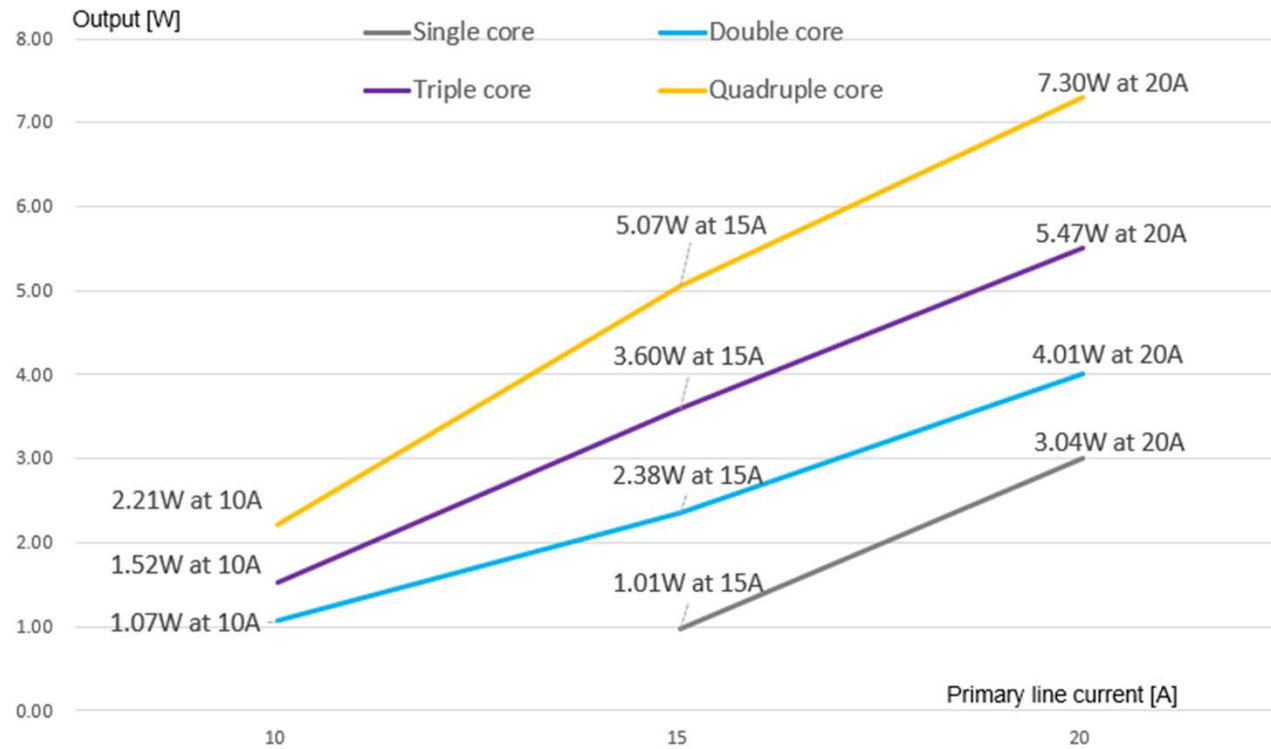
Tested under Tolenoid C[®] 1.30" (2ea) and SMPS (Switching mode power supply) 12V 20W environment.

Under load variation situations, SMPS will produce stable output power the user demands. Any further surplus output power caused by load variation control is managed by SMPS's control logics system of the production system. Even under the simultaneous variation in primary line and load, SMPS supplies stable output power.



GENERATE ELECTRICITY AT LOW CURRENT

Tested under Tolenoid C[®] 1.30" (1ea to 4ea) and SMPS (Switching mode power supply) 12V 10W environment.



INTRODUCING TOLENOID C[®] PRODUCTS



Tolenoid C®:

Contactless power supply solution, four kinds of Tolenoid C® (according to the thickness of the power line); so it is possible to generate electricity from 1.07 Watts to 105 Watts or more, depending on the configuration, power generation and supply to electric equipment by simply attaching Tolenoid C® to an existing power line, transformer is not required.



SMPS:

Switching mode power supply, prevent overvoltage, overcurrent, and overload, stability with power line regulation less than 1%.



Multi-adapter:

Connect Tolenoid C®, SMPS, and separator, able to connect 4ea of Tolenoid C® per multi-adapter.



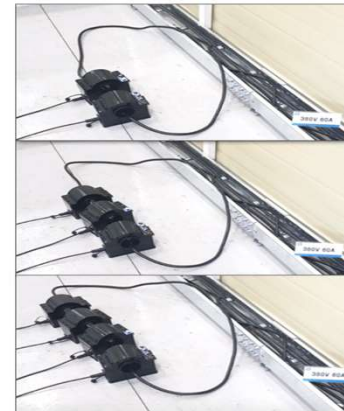
Separator:

The separator eliminates the magnetization that occurs when the Tolenoid C® is installed in the magnetic field around the power line and enable safe install or de-installation.

EASY INSTALLATION







LINEAR POWER SCALABILITY



FOUR KIND OF TOLENOID C[®]

Tolenoid C[®] can be installed wherever power lines are regardless of its voltage such as high-voltage distribution lines, underground lines.

Spec.		PH4IoT	Above ground or Underground for IoT		
					
Power line specifications	line thickness (inches)	Under 0.90	Under 1.30	Under 2.48	Under 5.90
	line current (A)	~ 15	10 ~ 650	10 ~ 650	10 ~ 650
	line voltage	~380 V	~ 30 kV	~ 30 kV	154 kV
	line diameter (inches)	~ 0.90	~ 1.30	~ 2.48	~ 5.90
Environmental specifications	operating temp. (°F)	-13 ~ 158	- 40 ~ 185	- 40 ~ 185	- 40 ~ 185
	ingress protection (dust/water proof)	IP65	IP67/68	IP67/68	IP67/68
Dimensions	size (inches)	4.37×3.15×3.23	5.12×3.94×4.33	6.69×3.94×5.90	11.30×7.87×4.02
	weight (lb)	2.20	4.70	7.05	5.29

TOLENOID C[®]

Under 1.30 and 2.48 inches

- Tolenoid C[®] convert magnetic energy around power line into electric power form for various electric devices.
- Tolenoid C[®] can be installed into power lines regardless of its voltage such as high voltage distribution lines, underground lines as a form factor of splittable one which make them possible easy install Tolenoid C[®].
- Tolenoid C[®] can save electric device installation cost and time compared to conventional way which requires transformer and complex wiring process for 110 or 220Vac power line.
- Secure electric power energy generation from 10 - 650 Ampere power line.
- Electric power generation capacity depends on the current of the primary power line and this can be controlled Ferraris designed SMPS type.
- Maximize efficiency of induction electricity generation by effective Core design and manufacturing process from Ferraris technology.
- Waterproof case design. (IP65 - IP68)



Line thickness
Under 1.30 inches



Line thickness
Under 2.48 inches



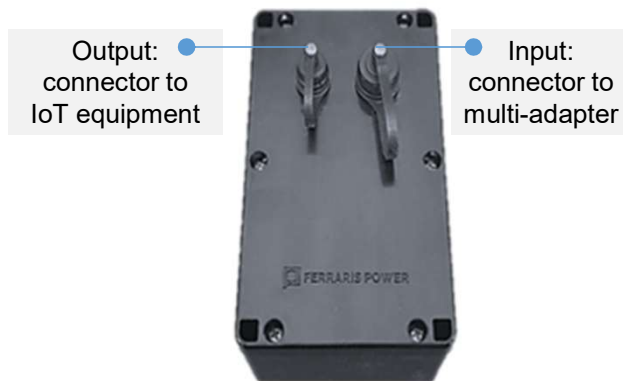
Split form factor

Specifications	Under 1.30 "	Under 2.48 "
Primary power line current (A)	10 ~ 650 A	
Primary power line voltage (V)	~ 30 kV	
Primary power line wire thickness (inches)	~ 1.30	~ 2.48
Output current type	AC output	
Working temperature (°F)	- 40 ~ 185	
Waterproof (IP)	IP 65 ~ 68 (KS C IEC 60529)	
Size (W*D*H inches)	5.12 * 3.94* 4.33	6.69 * 3.94 * 5.90
Weight (lb)	4.70	7.05
Case material	PC GF 20	

SMPS (SWITCHING MODE POWER SUPPLY)

12V 20W and 24V 60W

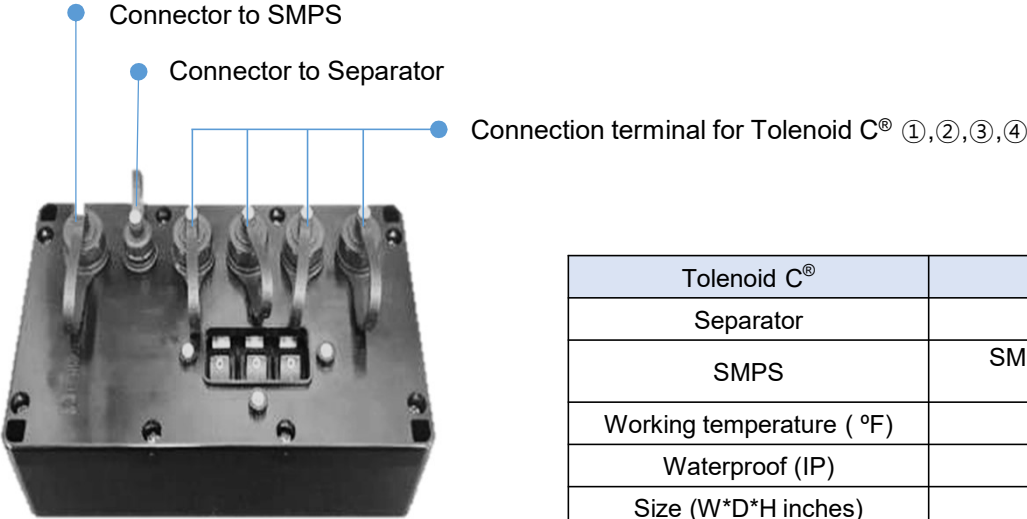
- SMPS block is a semiconductor-based circuit board which convert AC input from Tolenoid C[®] into to a DC output for the user requirement or multi-adapter for multiple Tolenoid C[®].
- SMPS block is basically composed of two component. Incoming AC signal is converting into DC signal by regulator sub-block and this DC signal is smooth by advanced SMPS block for stable DC output.
- SMPS block has the following features.
 - 1) Preventing overvoltage, overcurrent, overload feature
 - 2) Line regulation less than 1%
 - 3) Control maximum output controllability
 - 4) Incoming input controllability
- Available IP65 - IP68 case design available.
- Scalable power output capacity is possible depending on customer need.



Specifications	12V 20W	24V 60W
Input	Output of Tolenoid C [®]	
Output	DC 12V/20W	DC 24V/60W
Working temperature (°F)	- 40 ~ 185	
Waterproof (IP)	IP 65 ~ 68 (KS C IEC 60529)	
Size (W*D*H inches)	3.54 * 5.51 * 2.36	
Weight (lb)	1.87	
Case material	PC GF 20	

MULTI-ADAPTER

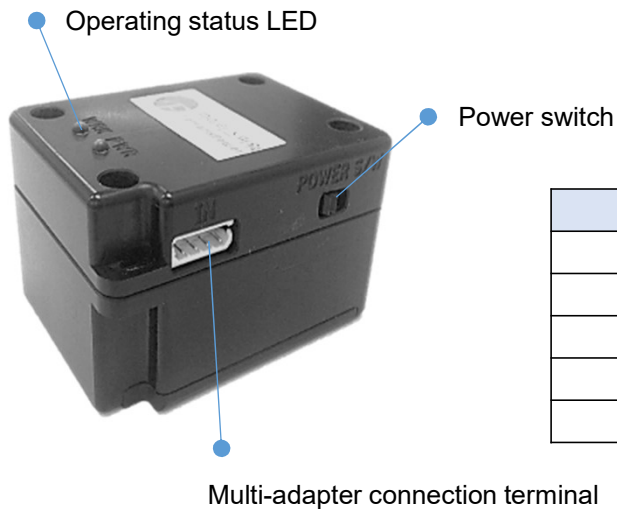
- Multi-adapter is a sub-block tool that allows multiple Tolenoid C[®] to be connected and operated.
- The multi-adapter has four Tolenoid C[®] connectors and one for each SMPS and Separator. For the future usage, Tolenoid C[®] connectors can be added more, such as up to eight. Deliver generated power from these multiple Tolenoid C[®] to SMPS block.
- You can switch on and off each Tolenoid C[®] by pressing switch even if you connect them up to multiple Tolenoid C[®].



Tolenoid C [®]	Up to 4ea
Separator	For installation/de-installation
SMPS	SMPS connections based on desired voltage and output
Working temperature (°F)	- 40 ~ 185
Waterproof (IP)	IP 65 ~ 68 (KS C IEC 60529)
Size (W*D*H inches)	7.09 * 3.94 * 1.77
Weight (lb)	2.09
Case material	PC GF 20

SEPARATOR

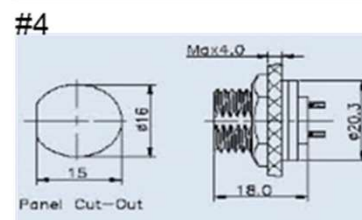
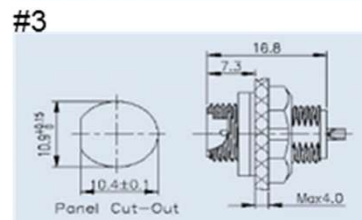
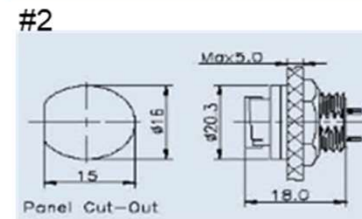
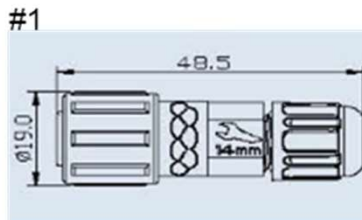
- The Separator is tool for safe installation or de-installation of Tolenoid C[®] at active power line without shutting down power line.
- The Separator make it possible of demagnetization of Tolenoid C[®] occurred when the Tolenoid C[®] is installed in the magnetic field around the active power line. With Separator on, you can install or de-install Tolenoid C[®] at active power line without physical force or other big tools.
- Install or de-installation using physical force or other equipment without the Separator causes a safety problems such as finger jammed in between and there is a risk of injury by cutting surface of the core.
- Be sure to sue the designated Separator for Tolenoid C[®] check product serial numbers.



Specifications	
Working temperature (°F)	- 40 ~ 185
Waterproof (IP)	IP 40 (KS C IEC 60529)
Size (W*D*H inches)	1.93 * 2.60 * 1.50
Weight (lb)	0.29
Case material	Plastic

CABLE AND CONNECTOR - OBTAIN UL & CUL CERTIFICATION, WATERPROOF TEST PASS - IP 68

- Cable Connector: Internal wiring of electrical electronic equipment
- Cable Connector: #1 Connector connected to cable, male & female pin (screw type, solder)
- Output Connector: #2 Tolenoid C[®], Multi-adapter output connector, panel mount & female pin (lock bayonet type, solder), #3 SMPS output Connector, rear panel mount & male (screw type, solder)
- Input Connector: #4 Multi-Adapter, SMPS input connector, panel mount & male pin (screw type, solder)



Interface Cables	
Rated	(UL) 221°F 300V
Insulation vessel	UL 1007, UL 1061 Type
Flammability	VW-1, FT-1 Satisfied
Application specification	UL Subject 758, 1581 CSA C22.2 No. 210

Cable Connector	
Panel thickness (inches)	0.138 ~ 0.268 inches
Environmental protection	IP 67 or 68 (IEC 60529)
Mechanical life	500 Mating cycles
Operating temperature (°F)	- 49 ~ 221
Voltage rating	110 V
Rated current (104 °F)	5 A

Output Connector	
Panel thickness (inches)	Max 0.196 inches
Environmental protection	IP 67 or 68 (IEC 60529)
Mechanical life	500 Mating cycles
Operating temperature (°F)	- 49 ~ 221
Voltage rating	30 ~ 300 V
Rated current (104 °F)	2 ~ 10 A

Input Connector	
Panel thickness (inches)	Max 0.157 inches
Environmental protection	IP 67 or 68 (IEC 60529)
Mechanical life	500 Mating cycles
Operating temperature (°F)	221
Voltage rating	30 ~ 300 V
Rated current (104 °F)	2 ~ 10 A



6671 S. Las Vegas Blvd. Building D, Suite 210, Las Vegas, NV 89119

702.957.6001

ferraris@ferrarispower.com

www.ferrarispower.com