



Technical Note

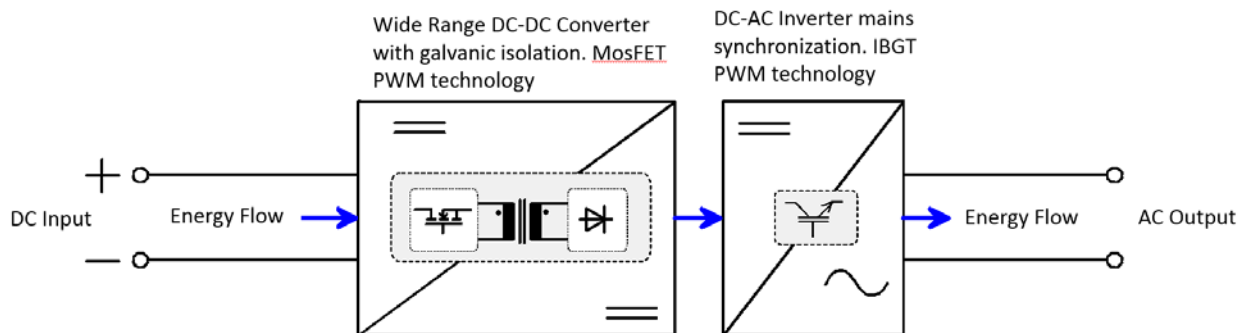
ELR Series Frequently Asked Questions. We have the answers!

Intepro's ELR9000 Series of regenerative electronic DC loads offers all the necessary features of today's electronic loads plus the added benefit of energy recovery. Recovering energy that drives cost savings is compared to traditional electronic loads that dissipate loaded energy in the form of heat. This heat needs to be dissipated by means of costly water cooling or air-conditioning infrastructure. As a result of this industry changing technology below are some answers to frequently asked questions.



Question: Seems too good to be true. How does it work?

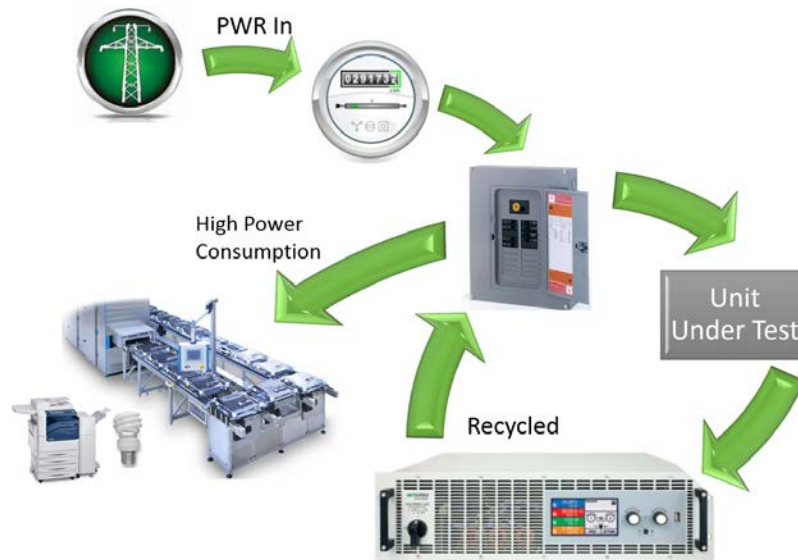
Answer: While we would like to think so, it's not magic. DC energy flows into a DC-DC converter which is tied into a DC-AC inverter (current source) that synchronizes with the distribution grid and the energy is recycled. This technology is similar to grid-tied photovoltaic inverters (PV).





Question: Is the energy meter going to spin backwards?

Answer: We wish... well... actually it could. The ELR recovers up to 95% of the loaded energy and recycles this back to the facilities AC mains network. In most cases the power recycled from the ELR is less than the high power that is consumed by the buildings local distribution network. So when could it?



If the ELR is connected to a device that generates independent power (renewable or stored), for example a generator that has an AC-DC converter, a Photo Voltaic System or a battery storage system, then in this case, as the UUT is not drawing any power from the local network and the ELR is recycling power back to the local network, the ELR is acting as a net contributor to the local network. If the load's net power contribution exceeds the power power being consumed by the rest of the building, then yes, it could spin the electrical meter backwards.

Question: Do the local utilities allow the ELR to be tied to the local grid. Do they require some special certification?

Answer: Yes, utilities allow the ELR to be connected to the grid. As mentioned above its unlikely the recovered power will ever leave your building's local distribution network so the utility grid will never see the power. Recovering energy offsets the overall energy consumption.



The ELR “is intended for general industrial and laboratory operation and therefore does not fall under the regulations of Electric Power Generation and Distribution”. The ELR is CE certified and meets strict EN 50160 (grid class 2) emissions and immunity standards. The ELR also certified to EN 60950 safety which is the same as UL 60950 and CSA C22.2.

Question: What happens if the utility grid drops out and the DC energy is being generated from devices that are not connected to the grid? Will the ELR continue to deliver power and potentially shock someone?

Answer: No, we thought about that. The ELR includes an automated grid monitoring system that detects phase voltage and frequency that is used for grid synchronization. If the grid drops out so does the ELR. The unit simply shuts down and waits for the operator to turn it back on.

Question: Can the ELR be wired into 480VL-L Three phase?

Answer: The ELR 9000 is available in two model series. The standard ELR 9000 connects to 208 V AC or 400 V AC utility mains. The ELR 9000 **HP (high power)** is “wide-ranging” and connects to three phase utility mains of 360 V – 528 V AC.

Question: Is utility mains connection the only difference in the ELR 9000 and ELR 9000 HP?

Answer: The available load power is different between the two. A single ELR 9000 3U chassis is capable of 3.1, 6.2 or 9.3 kW while the ELR 9000 HP is 5, 10 or 15 kW in a single 3U chassis.

Question: Can the ELR units be operated in parallel?

Answer: Yes. The ELR units can be operated in parallel in a true master slave setup to achieve power levels in excess of 100KW. In fact, multiple ELR’s are capable of either independent or parallel operation by simply changing the configuration thru the intuitive front panel touch screen. The ELR’s must be the same model for both current and voltage ratings.

Question: What are some of the other benefits of the ELR load?

Answer: The ELR offers several benefits compared to a traditional electronic load.

The ELR pays for itself over time! By recycling up to 95% of loaded energy the ELR operates at just 5% of the cost compared to traditional loads. In burn-in applications the return on investment could be less than three years.

ELR offers models that can test up to 1500Vdc. The ELR uses a buck/boost front end converter that can handle voltages much higher than traditional MOS-FET and IGBT loads.

Reliability of the ELR series is excellent because the load dissipates very little heat load per kW tested due to its efficiency and it does not use large amounts of MOS-FETs or IGBTs in parallel to handle heat dissipation.



Quiet cool operation due to its high efficiency keeping the work environment cool and quiet compared to loads that need large fans or chillers to keep the loads cool.

Proven savings!

Enter Usage Data

Hrs/Day	24
Days/Week	5
Total Hrs/Mo	480
Watts	10000
\$/kWh	\$ 0.11

ELR ROI Calculator

Usage	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Watts	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000
HRS/Day	24	24	24	24	24	24	24	24	24	24	24	24
Hrs/Mo	480	480	480	480	480	480	480	480	480	480	480	480
Total kWh/Mo	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800
Current Cost \$	\$ 528	\$ 528	\$ 528	\$ 528	\$ 528	\$ 528	\$ 528	\$ 528	\$ 528	\$ 528	\$ 528	\$ 528

Total Yearly \$ 6,336

ELR Usage	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ELR Efficiency	94%	94%	94%	94%	94%	94%	94%	94%	94%	94%	94%	94%
New kWh/Mo	288	288	288	288	288	288	288	288	288	288	288	288
New Cost \$	\$ 32	\$ 32	\$ 32	\$ 32	\$ 32	\$ 32	\$ 32	\$ 32	\$ 32	\$ 32	\$ 32	\$ 32

New Yearly \$ 380.16

Total Yearly Savings! \$ 5,956

ELR Cost \$ 15,200
Comp. Cos! \$ 13,200

The ELR purchase ROI	2.6 YEARS
ROI versus buying traditional	0.3 Years

COMPARE USAGE!

Month	Total kWh/Mo	New kWh/Mo
1	4800	288
2	4800	288
3	4800	288
4	4800	288
5	4800	288
6	4800	288
7	4800	288
8	4800	288
9	4800	288
10	4800	288
11	4800	288
12	4800	288

If you have additional questions about the ELR please contact Intepro Systems.

<https://www.inteproate.com/contact/>