



# Electric Vehicles: Enabling Infrastructure

# Electrification of transport

## Overview

The increase in electric vehicles (EVs) is already having a major impact on energy network management. This will only increase as numbers of EVs grow rapidly.

The mix of new infrastructure requires upgrades to existing networks, monitoring and control of the network to deliver the flexibility customers demand. This has to be managed in conjunction with the increasing flexibility from renewable generation sources.

## How we can help

**Providing the infrastructure, knowledge and expertise**, Lucy Electric and Lucy Zodion are ideally equipped to provide end-to-end e-mobility ecosystems.

From monitoring and managing network infrastructure, to connected and adaptive on-street EV solutions, we have a wealth of experience ensuring our capability to future-proof smart city and home solutions.

Home to street to forecourt, slow to ultra-fast charging, we provide next generation intelligent devices to make smart solutions connectable across the electrical infrastructure.

## Tried and tested products

Lucy products have distribution network operator (DNO) approvals throughout the UK.

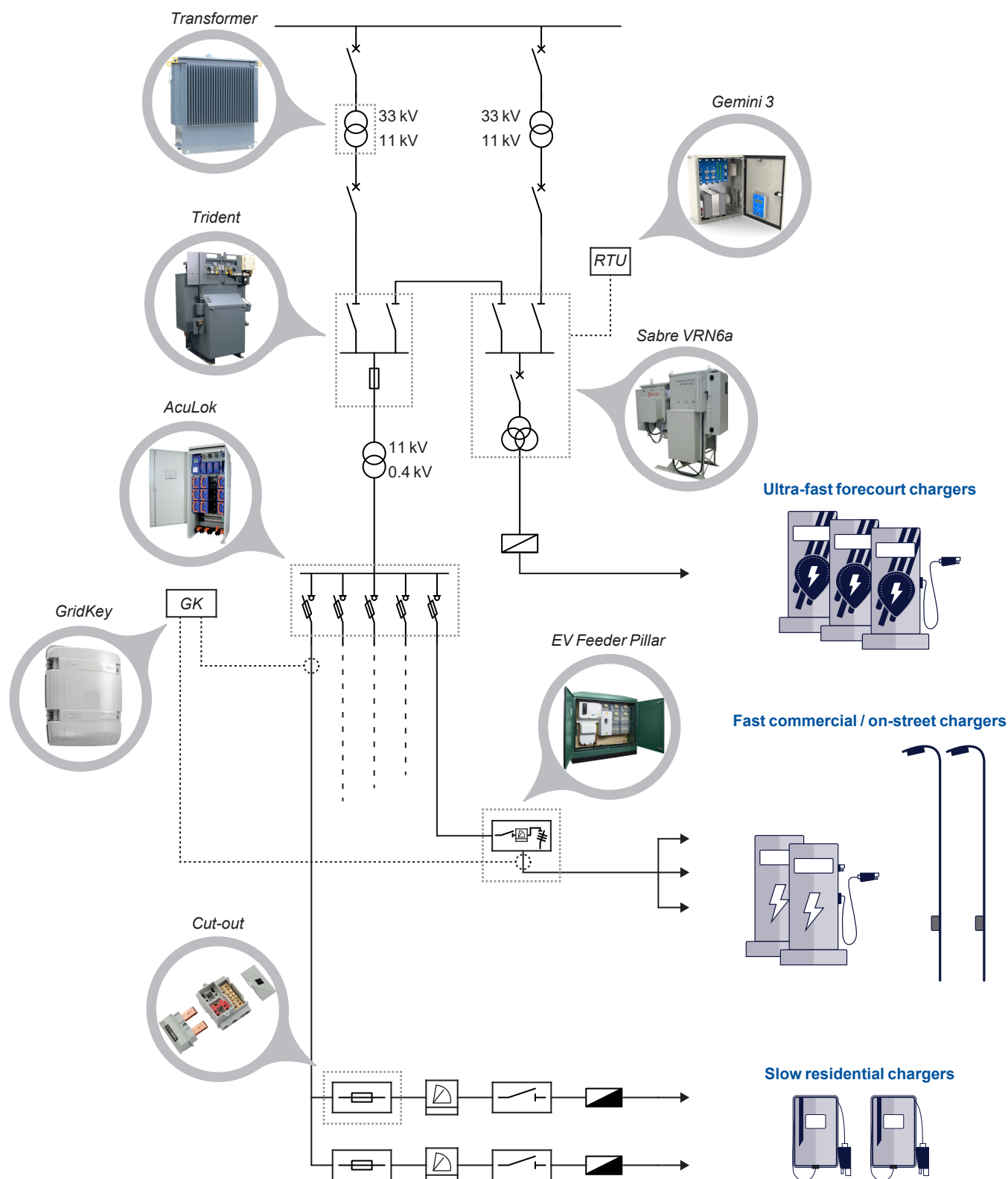
Rigorous in-house and independent third-party testing is completed to our products ensuring they meet industry and safety standards.

Our offering ranges from **Package Substations** for ultra-fast EV chargers, **pre-wired EV Feeder Pillar** for commercial and street lights connections, and **Cut Outs** for residential charging applications.

Our products are connected to provide extra safety by way of monitoring and control. The **Gemini RTU** range enables local control to ensure flexibility of the network is maintained, and **GridKey LV monitoring** solution provides an understanding of the available capacity on the local networks allowing for improved planning.

With over 200 years of history and considerable experience in electrical networks, we are ideally placed to deliver a range of solutions for EV charging infrastructure.

To find out more about us, visit:  
**[www.lucyelectric.com](http://www.lucyelectric.com)**



# Power distribution substation

## Integrated MV and LV power distribution cabinet and a fluid filled distribution transformer

- Full end-to-end solution - from initial specification, engineering, build, contract / project management, delivery to site
- Extensive sales and tendering support providing expert guidance, working in collaboration with the end client to ensure specification is met and prompt tender return
- Offering a competitive / selective solution with a wide range of product options
- Not tied to any specific transformer manufacturer providing full flexibility, choice and the ability to comply with all DNO / IDNO and general industrial specification requirements

### Benefits:

- One point of contact
- UK stock reducing lead-times
- Pre-assembled improving installation times
- Technical expertise and support, end-to-end
- Competitive market-leading products in one 'Lucy Electric' solution
- Approved by DNO / IDNO (G81 recommendations)
- Fully ENA (Energy Networks Association) approved
- Fully Lucy Electric warranted solution



# Transformers

## Standard transformer ranges from 315 to 1500 kVA, with higher ratings also available

- All Transformers provided will be to the latest EU standards (Eco loss) and recommendations
- Highly energy efficient with very low eddy current and hysteresis losses
- Extremely low noise making design to comply with the local requirements
- Free breathing and hermetically sealed variants available. (Cast resin variants can be supplied on request)
- Mineral oil (standard) or high fire point fluid options (Midel, Silicone)
- ESI unit type (HV and LV connections on the same side), or BEBS style (HV and LV connections) on opposite side Transformers are available









# Ring Main Units

## Sabre

### SF<sub>6</sub>-insulated with vacuum circuit breaker protection

- Up to 24 kV and 630 A ratings
- Non-extensible, extensible, and modular range
- IP54 for outdoor installation without requiring a kiosk
- Seamless integration with SCADA network for remote operation and control
- Maintenance free with 30 years life expectancy

Technical Data					
Rated voltage	kV	12	15.5	17.5	24
Rated current: ring switch	A	630	630	630 / 400	630
Rated current: vacuum circuit breaker	A	250 / 630	250 / 630	400 / 630	250 / 630
Impulse withstand voltage	kV	75	95	95	125 / 145
Short circuit making current	kA	50	50	54.6	40
Short circuit breaking current	kA	20	20	21	16
Internal arc rating	kA/1 sec	20	20	21	16



## Trident

### Oil-insulated with fuse protection

- Up to 15.5 kV and 630 A ratings
- Non-extensible, extensible, and modular range
- Fuse switch fitted with shunt trips for remote tripping
- IP54 for outdoor installation without requiring a kiosk
- Seamless integration with SCADA network for remote operation and control
- Maintenance free with 30 years life expectancy

Technical Data		
Rated voltage	kV	15.5 kV
Ring switch rated current:	A	630 A
Fuse switch rated current:	A	200 A
Mode of fault current interruption		HV fuses
Impulse withstand voltage	kVp	95 / 110 kVp
Short circuit making current	kA	50 kA
Short circuit breaking current	kA	20 kA



# Low Voltage Distribution

## AcuLok

### Transformer mounted LV distribution cabinet

- Innovative, safe and operator friendly fuse handle technology
- Up to 8 outgoing fuse ways with 630 A rating
- Off-load disconnecter
- IP34D protection for indoor and outdoor installation

Technical Data	
Rated voltage	400 V
Rated current outgoing fuse ways	630 A
Disconnecter rated current	1600 A
Mode of fault current interruption	Fuse
Number of outgoing fuse ways	4, 5, 6 or 8
Fuse types	BS88 J type, 92 mm
Mounting options	Transformer mounted with 'F' type flange
Cable connection	3C / 4C, 300 mm <sup>2</sup>



### AcuLok is also available with different options and accessories

- ACBs up to 2500 A directly connected to transformer flange
- MCCBs up to 1600 A fitted to a chassis assembly
- Ganged fuse ways with metering facilities
- 3 phase disconnecter handle
- 4-core cable kit







# EV Feeder Pillar

As one of the UK's leading suppliers of pre-wired power distribution enclosures, we understand the importance of electrical safety and flexibility to meet the growing demands of power infrastructure.

Our standard range of pre-wired supply pillars for EV charging, come in four sizes and can supply power for up to 16

All solutions are developed in line with the IET Code of Practice for Electrical Vehicle Charging Equipment Installation (BS7671).



## On-street

We have a number of solutions to match a range of fast charging requirements, from supplying the appropriate amount of power to a charging point, to ensuring street lighting infrastructure is capable of supporting EV charging

### On-street charging

Cut out type	Trojan Midi
5.8 kW (32 A SPN)	2 x RCBO's (25 A/30 mA and 6 A/30 mA)
Maximum charge points	1 (per lamppost)

## Fast

Fast EV charging points usually provide power from 7.4 kW to 22 kW and typically fully charge an EV in 3-4 hours. They are often found in retail car parking facilities or on-street, where people have more time to spare.

### Rapid charging

Pillar Type	Fortress 14 3ph 100 A	Fortress 24 3ph 200 A	Fortress 40 3ph 400 A	Fortress 40 3ph 630 A
7 kW (40 A SPN)	✓	✓	-	-
Maximum charge points	8	16	-	-
22 kW (40 A TPN)	✓	✓	✓	✓
Maximum charge points	3	6	12	12

## Rapid

Current Rapid AC chargers are rated at 43 kW, while most Rapid DC units are at least 50 kW. Our EV supply pillars support both AC and DC charge points and have the capacity to enable charging for the majority of EV's to 80% in around 30-60 minutes (depending on battery capacity).

### Rapid charging

Pillar Type	Fortress 14 3ph 100 A	Fortress 24 3ph 200 A	Fortress 40 3ph 400 A	Fortress 40 3ph 630 A
43 kW (63 A TPN)	✓	✓	✓	✓
Maximum charge points	2	4*	8*	10
50 kW (80 A TPN)	✓	✓	✓	✓
Maximum charge points	1	3*	5*	7

*\*Use of load management on chargers is required*

## Super fast

Super or ultra-fast EV charging points are able to provide up to 120 kW of power. Our Super EV charging supply solutions, feed power to EV charge points at a maximum rated speed. This gives electric vehicles that have the battery capacity, 80% of charge in approximately 30 minutes.

### Super fast charging

Pillar Type	Fortress 40 3ph 400 A	Fortress 40 3ph 630 A
120 kW (250 A TPN)	✓	✓
Maximum charge points	2*	3

*\*Use of load management on chargers is required*

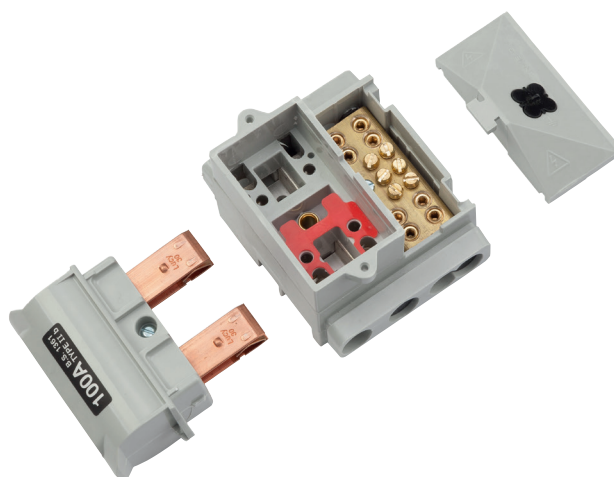
# Cut Outs

## Heavy Duty Cut Out

### Single and three phase cut outs

Available in either 60/80 A or 100 A ratings, in CNE/SNE formats with a range of accessories.

Technical Data	
Maximum rated current	60/80, 100 A
Rated voltage	240 / 400 V
Fuse short circuit rating	33 kV at 0.3 pf



## Cut Out with Metering Chamber

### Three phase cut out with metering

Wall mounting fused service heads with ratings up to 630 A for indoor applications.

Available also with an integral CT metering chamber which accepts latest generation smart meters.

Technical Data	
Busbar rated current	200, 400 or 630 A
Rated voltage	400 V
Rated insulation voltage	690 V
Fuse handle maximum rating	As above
Max incoming cable size (630 A)	300 mm <sup>2</sup>
Max incoming cable size (200 A)	185 mm <sup>2</sup>
Cable connection	Via mechanical shear off connectors, lugs (optional leader clamps on outgoing)









# Automation and monitoring

## Gemini - Automation

**Gemini is a flexible Remote Terminal Unit (RTU) platform for advanced feeder automation on electrical distribution networks. It provides a secure operation with built-in diagnostics, continuous status monitoring and alerts.**

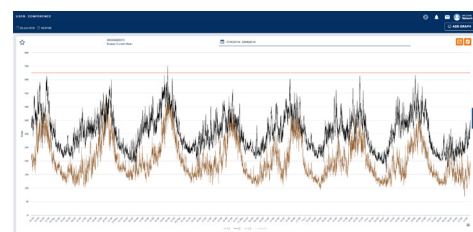
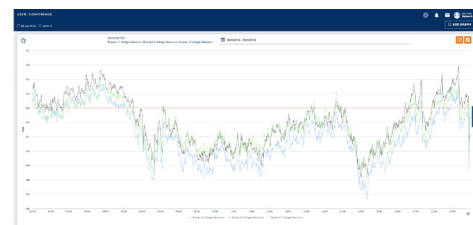
- Dedicated motor power enable relay output providing safe and secure operation of switchgear
- Flexible communication options
- Enhanced cyber security features for use in Critical National Infrastructure
- Optimised form factor providing efficient assembly into control cabinets and switchgear panels
- Easy to configure, customisable product adapting to different solutions
- Pluggable terminal blocks improving installation times
- Secure firmware and configuration
- Simple in-built configuration tool for easy customisation



## GridKey - Monitoring

**GridKey provides continuous remote monitoring, warnings, status, and loading information of substations. As a result, customers experience reduced network maintenance costs and significantly increased knowledge of the state of the LV/MV grid.**

- Easy to fit and compact - custom designed for monitoring Low Voltage substations
- Robust and durable
- No calibration or maintenance needed
- Class 2 metering accuracy
- Comprehensive reporting of substation feeders
  - Overvoltage: 300 V rms (Category IV)
  - Current: 720 A (per feeder phase)
- High-resolution data (up to 1 second)
- 2.5G/GPRS mobile data transfer
- 4G technologies LTE CAT-M1 and NB-IoT
- Ethernet





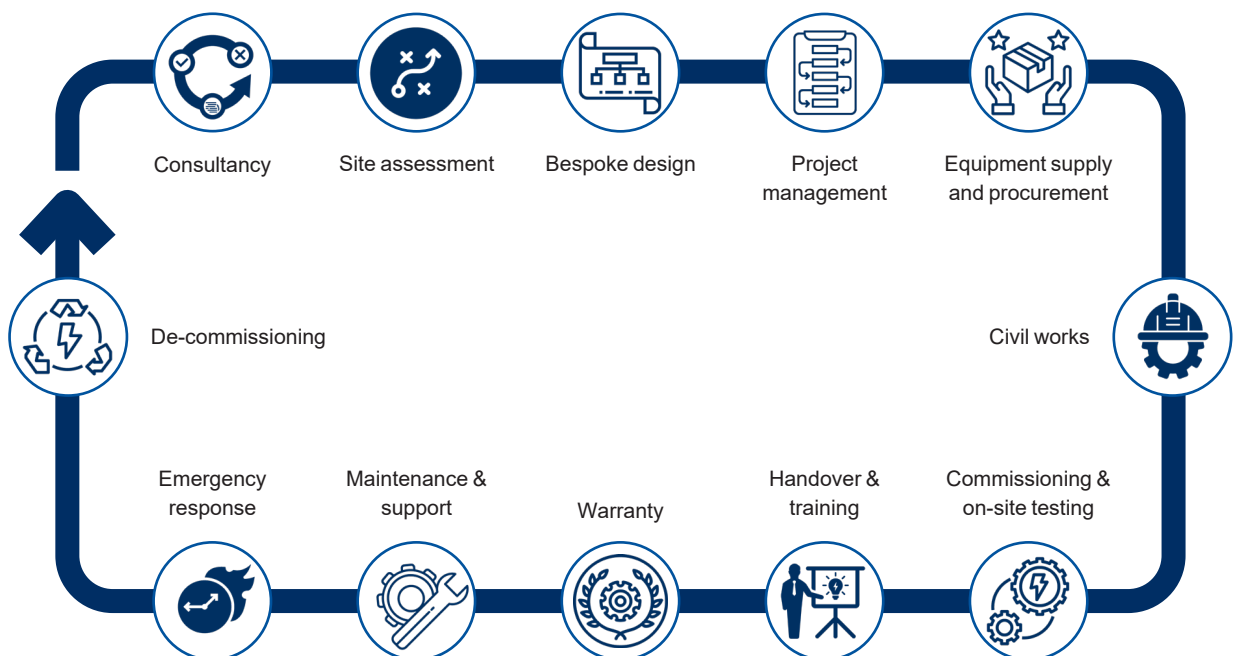
# Energy Services

## Complete product lifecycle

Our aim at Lucy Electric is to ensure that you consistently get the very best from our technology – and your budgets.

With our integrated set of product lifecycle services, ranging from after sales support to training and consultancy, we provide incisive expertise and timely assistance throughout the lifecycle of your high performance Lucy Electric products.

Whether you are managing extensive distribution networks, expanding, updating or automating your operation, Lucy Electric has the products and services to give you peace of mind that your assets are being effectively managed and maintained.



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