Lucy Electric

Aegis 36
ring main unit

engineering intelligent solutions

Why **Aegis**^{36}

Built upon the strong foundations of the Aegis *Plus* product family to provide the right features for our customers:

+ Flexible and cost effective
+ Safe and intuitive operation
+ Compact Design
+ Automation ready
+ Easy to install
+ Climate independent
+ Wide range of protection relays, VPIS and VDS
+ Virtually maintenance-free
+ Wide range of options and accessories

To find out more about us, visit:
www.lucyelectric.com

Product panorama: Lucy Electric medium voltage and high voltage range

Ring main units	Rated voltage (up to)	Mode of fault current interruption	Insulation medium	Rated current (up to)	Mounting	Installation condition	Operation
Aegis *36*	36 kV	Vacuum	SF_6	630 A	Ground	Indoor / Outdoor	Local / Remote
Aegis *Plus*	24 kV	Vacuum	SF_6	630 A	Ground	Indoor / Outdoor	Local / Remote
Sabre	24 kV	Vacuum	SF_6	630 A	Ground / Transformer	Indoor / Outdoor	Local / Remote
Scimitar	17.5 kV	Fuse	SF_6	630 A	Ground / Transformer	Indoor / Outdoor	Local / Remote
Trident	15.5 kV	Fuse	Oil	630 A	Ground / Transformer	Indoor / Outdoor	Local / Remote
Air Metering Units							
Aegis *Plus*	24 kV		Air	630 A	Ground	Indoor/ Outdoor	
Sabre	15.5 kV		Air	630 A	Ground	Indoor/ Outdoor	
Oil	15.5 kV		Oil	630 A	Ground	Indoor/ Outdoor	

Introduction to **Aegis**^{36}

Aegis^{36} is Lucy Electric's latest product, originating from the very successful Aegis Plus product family. It is specially designed for secondary distribution networks, wind farms and photovoltaic power stations with ratings up to 36kV. This range is available for indoor and outdoor environments, suiting various application needs. Aegis^{36} offers high levels of reliability and operator safety. It is a compact, cost-effective and virtually maintenance-free product.

Product Features

- 36 kV and 630 A ratings
- Non-extensible range
- Flexible arrangements of functions, providing the exact solution
- 3 and 4 functions in a single SF6 insulated stainless steel enclosure
- Hermitically sealed stainless steel switching chamber
- No on-site SF6 gas handling for installation
- Intuitive single-line mimic diagram
- Vacuum interrupter for circuit breakers
- Suitable for indoor and outdoor applications
- Circuit breaker protection using a wide range of self-powered and auxiliary relays
- Motorisation for remote control
- Easy integration with SCADA networks
- Front access cable terminations, with DIN 400 Type C bushings

Customer Benefits

- Economic full life cost
- Virtually maintenance-free
- Climate independent
- Proven and reliable technology
- Simple and safe installation
- Tool-free cable termination
- Easy to install
- Compact, suitable for mini-substations
- Automation-ready

Additional safety features

- Internal Arc Protection for gas enclosure and cable compartment
- Fully interlocked mechanisms with padlocks
- Anti-reflex mechanism
- Accessible cable Earth & Test facility at the front of the unit
- Wide range of VPIS and VDS, according to IEC standards

Applications

Power Generation and Distribution

- Ring Main network protection
- Wind farms
- Photovoltaic power stations
- Co-generation facilities

Industries

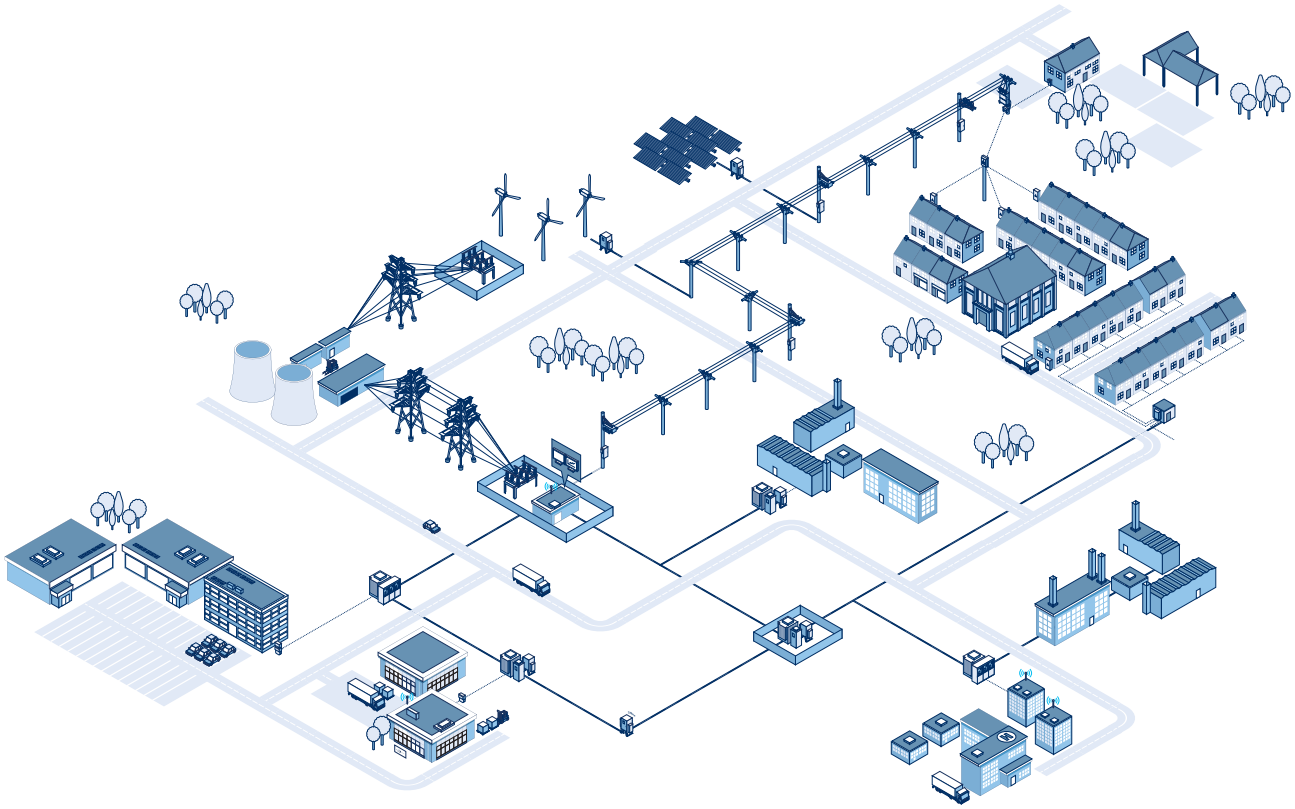
- Mining
- Automotive
- Iron and steel
- Paper and pulp
- Cement and petroleu
- Water and waste water

Commercial Buildings

- Shopping centres
- Hospitals
- Schools
- Hotels
- Office buildings
- Warehouses
- Data centres

Infrastructure

- Metro stations
- Railway stations
- Airports
- Seaports
- Tunnels



Automation Ready
Remote terminal unit (RTU)

The Aegis^{36} range can be configured with the next- generation Gemini 3 RTU. This is a highly flexible, general-purpose Remote Terminal Unit designed to remotely monitor and control medium and high voltage switchgear.

The Gemini 3 has a modular design such that it can be configured from a simple monitoring only device to a fully functional automated switch controller. It has the ability to transition from a basic to an advanced RTU by plugging in additional modules. These modules are rugged, making the device field serviceable and future proof.

Available Gemini 3 modules are:

Master Control Module (MCM) – This contains the main processor and supervises all modules. The MCM handles the protocol communications.

Single Switch Module (SSM) – This provides the inputs and outputs to perform secure interlocked control of a single gas enclosed switch.

Dual Switch Module (DSM) – This provides the inputs and outputs to perform secure interlocked control of two MV ring switches.

Power Supply Module (PSM) – This module works with the switch control modules to provide secure switching operations. The PSM generates regulated power to all other modules and external communication equipment. The PSM also provides the intelligent battery charging function to maintain a secure supply.

Input Output Module (IOM) – This is a general purpose module that covers digital and analogue inputs and relay outputs.

Fault Passage Module (FPM) – This is a dual fault passage indicator module which detects and alarms for Overcurrent and Earth Faults.

Human to Machine Interface (HMI) – This is an optional module that allows local control and monitoring without the need for a Computer. It allows local controls to be issued by an authorised Engineer (security enabled) or just provide data to be viewed locally.

Characteristics

- Fault detection (Earth and Phase)
- LED status indicators
- Real time clock (SCADA synchronised)
- Dual isolated Ethernet and RS232 ports
- Isolated RS485 port
- Supervisory selection and indication
- Event memory – 7000 events in non-volatile memory
- Communication protocol
  - DNP 3.0 TCP/IP or Serial
  - IEC 60870-5-101
  - IEC 60870-5-104
  - Modbus TCP or RTU
- Maintenance free

Technical data

Aegis^{36} ring main unit

Rated voltage	kV	36

General

Rated frequency	Hz	50
Rated lightning impulse withstand voltage		
Phase-to-earth	kVp	170
Across isolating gap	kVp	195/220
Rated power frequency withstand voltage		
Phase-to-earth	kV for 1 min	70
Across isolating gap	kV for 1 min	80
Degree of Protection		
Indoor	IP	IP41
Outdoor	IP	IP54
Tank with HV parts	IP	IP67
Mechanical impact protection	IK	IK07
Internal arc rating		
Gas enclosure - AF	KA 1 sec	16, 20, 25
Cable Compartment - AF (optional)	KA 1 sec	16, 20, 25
SF6 gas		
Annual leakage rate	%	≤ 0.1%
Filled pressure (at 20ºC)	Bar (G)	0.4
Minimum operating pressure	Bar (G)	0.3
Installation conditions		
Maximum altitude	m	1000
Relative humidity (max) – over period of 24hrs		95%
Continuity of Service	Class	LSC2
Partition Class	Class	PM
Ambient Air Temperature	°C	-25 + 55 °C

BusBars

Rated normal current	A	630
Rated short time withstand current	kA	20 kA (3 s), 25 kA (1 s)
Rated peak withstand current	kA	50, 62.5

Load Break Switch : L function

Rated normal current	A	630
Rated cable charging breaking current	A	35
Rated line charging breaking current	A	35
Rated cable and line charging current	A	60
Rated earth fault breaking current	A	105
Main electrical circuit		
Rated short time withstand current	kA	20 kA (3s), 25 kA (1s)
Rated peak withstand current	kA	50, 62.5
Earthing circuit		
Rated short time withstand current	kA	20 kA (3 s), 25 kA (1s)
Rated peak withstand current	kA	50, 62.5
Mechanical endurance class		
Load break switch	Class	M2 (5,000 operations)
Rated voltage	kV	36
Earth switch	Class	M0 (1,000 operations)
Electrical endurance class short circuit making		
Load break switch	Class	E3 (100 operations)
Earth switch	Class	E2 (5 operations)
Operating mechanism		
Local	Close – Open	Hand Lever
Remote	Close – Open	Motor

Circuit Breaker : V function (Non-auto reclose)

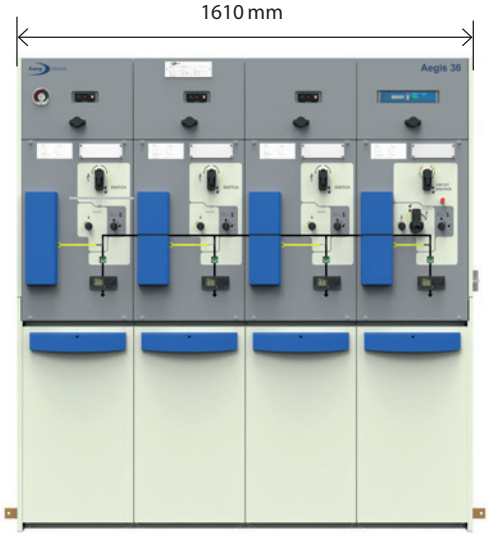
Rated normal current	A	200/630
Rated short circuit breaking current	kA	25
Rated short circuit making current	kA	50, 62.5
Rated cable charging breaking current	A	100
Rated line charging breaking current	A	10
Main electrical circuit		
Rated short time withstand current	kA	20 kA (3 s), 25 kA (1 s)
Rated peak withstand current	kA	50, 62.5
Earthing circuit		
Rated short time withstand current	kA	20 kA (3 s), 25 kA (1 s)
Rated peak withstand current	kA	50, 62.5
Mechanical endurance class		
Circuit breaker	Class	M1 (2,000 operations)
Earth switch	Class	M0 (1,000 operations)
Electrical endurance class		
Circuit breaker	Class	E2 (2 operations)
Earth switch	Class	E2 (5 operations)
Operating mechanism		
Operating sequence for mechanism		O-3min-CO-3min-CO
Local	Close – Open	Hand Lever - Pushbutton
Remote	Close – Open	Motor – Coil

Standards

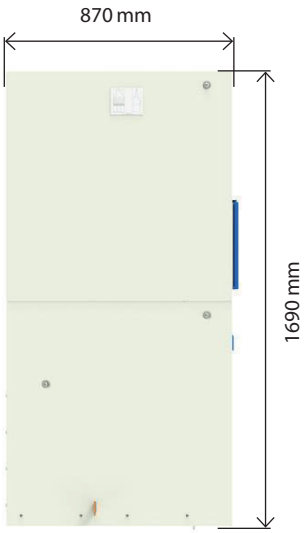
IEC 60694	Common Specification for Switchgear
IEC 60255	Measuring relays and protection equipment
IEC 61243-5	Voltage detecting systems (VDS)
IEC 62271-1	HV switchgear and control gear: Common specifications
IEC 62271-100	Alternating current circuit breakers
IEC 62271-102	Alternating current disconnectors and earthing switches
IEC 62271-103	Switches for rated voltages between 1kV and 52kV
IEC 62271-105	Alternating current switch fuse combinations
IEC 62271-200	AC metal enclosed switchgear and control gear
IEC 62271-206	VPIS systems for rated voltages between 1kV and 52kV

Dimensions

3-function unit



4-function unit



Side View

Disclaimer
Lucy Electric has a policy of continuous research and development and accordingly reserves the right to change the design and specification of its products without prior notice.

Lucy Electric worldwide offices

Lucy Electric UK Ltd
Howland Road, Thame, Oxfordshire,
OX9 3UJ, United Kingdom
Tel: +44 1844 267 267 General
Tel: +44 1844 267 222 Sales
Fax: +44 1844 267 223
Email: salesuk@lucyelectric.com

Lucy Middle East FZE
PO Box 17335, Jebel Ali, Dubai,
United Arab Emirates
Tel: +971 48 129 999
Fax: +971 48 129 900
Email: salesme@lucyelectric.com

Lucy Electric (Thailand) Ltd
388 Exchange Tower,
37th Flr Unit 3702,
Sukhumvit Road, Klongtoey Sub district,
Klongtoey District, Bangkok,
10110, Thailand
Tel: +66 (02) 663 4290
Fax: +66 (02) 663 4293
Email: salesth@lucyelectric.com

Lucy Electric India Private Ltd
H21, MIDC
Ambad, Nasik 422010, India
Tel: +91 253 2381603
Fax: +91 253 2381247
Email: salesIndia@lucyelectric.com

Lucy Switchgear Arabia Co. Ltd
Novotel Business Centre,
P.O. Box 35340, Dammam 31488,
Saudi Arabia
Tel: +966 138 147 910
Fax: +966 138 147 914
Email: salessa@lucyelectric.com

Lucy Electric South Africa Pty. Ltd
Unit 12 & 13, Block C,
Honeydew Business Park,
1503 Street, Laser Park,
Honeydew, 2170, South Africa
Tel: +27 11 025 7490
Fax: +27 11 794 3277
Email: salesza@lucyelectric.com

Postal Address:
P.O. Box 1078, Honeydew, 2040

Lucy Asia Pacific Sdn Bhd
Unit 17-05-06, Level 17,
PJX-HM Shah Tower,
No.16 Persiaran Barat,
46050 Petaling Jaya,
Selangor, Malaysia
Tel: +603 74910700
Fax: +603 79316923
Email: salesmy@lucyelectric.com

Lucy Electric (Beijing) Co. Ltd.
卢西电器（北京）有限公司
北京市朝阳区东三环北路霞光里
18号佳程广场A座1122室
邮编: 100027
电话: +86 1059 231 176
传真: +86 1059 231 177
电子邮件: salescn@lucyelectric.com

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