ARU Series

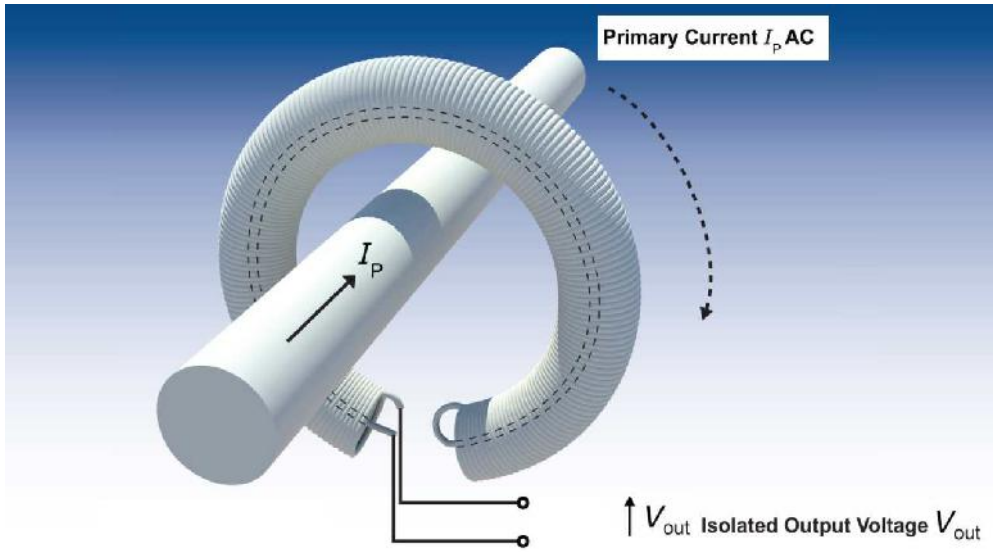
Ruggedized Outdoor

LEM

Life Energy Motion

Market needs & Technology

- **Market needs:** AC current sensing solutions for high and medium voltage grid automation and monitoring for outdoor new built or retrofit applications: Protection, safety, fault detection and location, power quality monitoring
- **Current sensor technology retained:** Rogowski coil principle



- **Air core technology without magnetic circuit** A pick up coil is magnetically coupled with the flux created by the current to be measured. A voltage is induced on the pick-up coil proportional to the derivative of the flux and this proportional to the derivative of the current to be measured
- **AC currents measurement only**
- **No linearity error - no saturation**

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LEM Rogowski coils portfolio

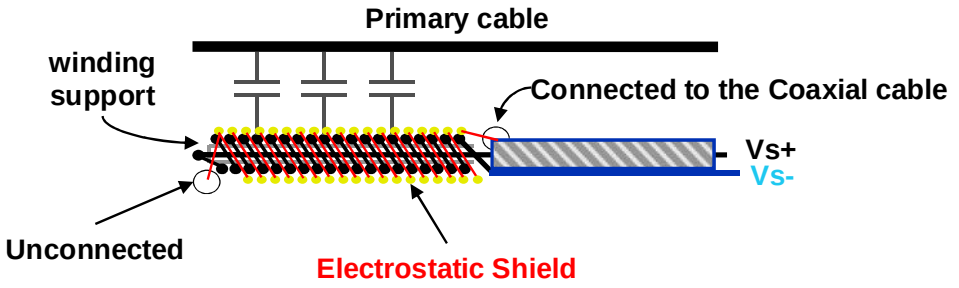
ART – Indoor applications

ARU – Outdoor applications

ARU
Ruggedized Outdoor

Main Features:

- 1 to 300000 A_{RMS} nominal
- Class accuracy 0.5 according to IEC 61869-10 regardless of primary conductor position
- Rated insulation voltage 1kV CATIII
- Flexible split-core current sensor for easy installation anywhere
- Almost perfect linearity, no saturation, no upper limit in current rating
- Internal shield
- Low output voltage proportional to the rate of change (derivative) of the primary current (electronic integrator required): 100 mV/kA @ 50Hz



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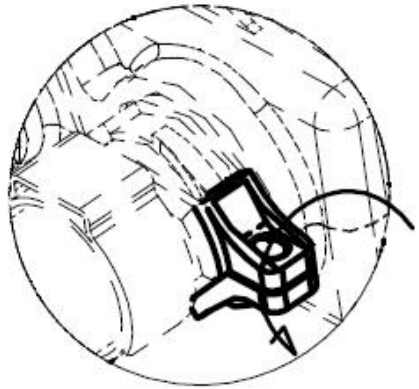
Main Features:

- 10.4 mm gauge with sensing apertures of Ø 70mm to 300mm
- Ruggedized outdoor UV, water, dust and ice resistant for outdoor installations
- Bandwidth: 50/60 Hz
- Operating range: -40°C to +80°C
- Fast clip-on mounting whilst cable is connected
- Slot expected to fix the loop on conductor with a cable tie
- Ø 2.4 mm hole to pass a security seal
- Teardrop shape models available



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Advantages:

- One unique design covering the range from 1 to 300000 A
- Do not saturate with overcurrent and short-circuit currents
- ‘Perfect Loop’ technology (patented coil clasp)

→ Not sensitive to the sensitivity to the position of the conductor inside the loop: Class accuracy 0.5 according to IEC 61869-10

→ Robust and fast ‘Twist and Click’ closure

- Pure Rogowski coil – No trimming resistors used to calibrate the coil

→ Simple copper wire wounded very accurately

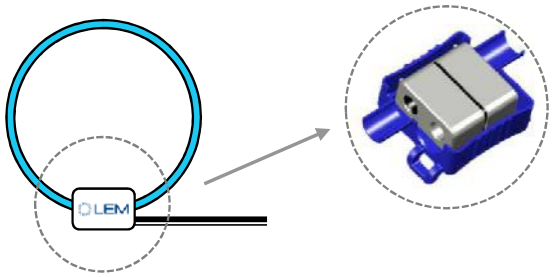
→ Long term stability, very accurate. Strong winding knowledge

→ Less sensitive to external environments, more accurate

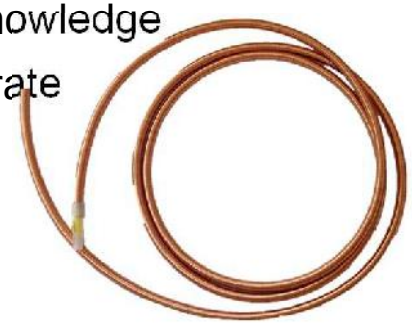
- Internal shield

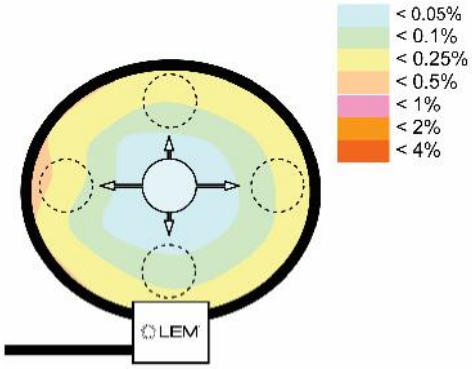
→ Better accuracy at low currents

→ Less sensitive to external environments



Measuring error vs the position of the primary conductor





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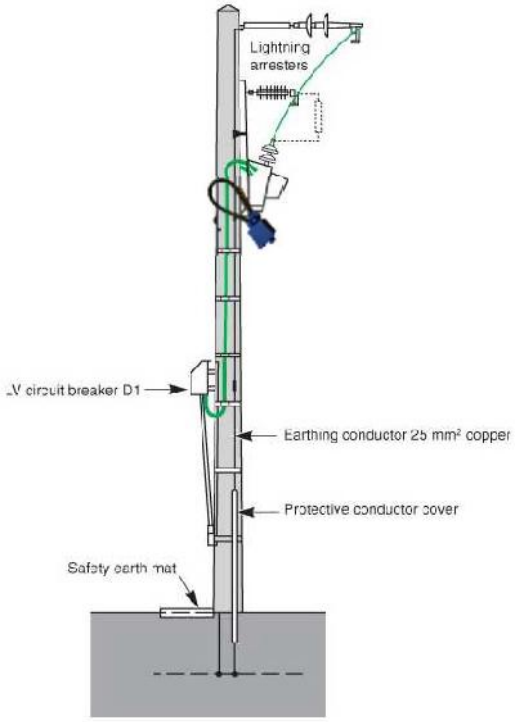
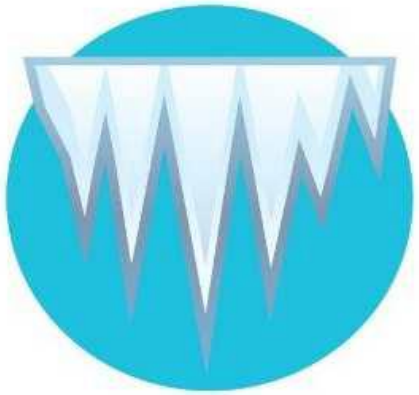
Advantages:

- Ruggedized outdoor:

→ UV resistant
→ Water resistant
→ Dust resistant
→ Ice resistant
→ IPx8
→ Ideal or outdoor installations





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Applications

- Distribution network management applications:
  - Outdoor substations
  - Distribution Transformer Monitoring
  - Underground substations
  - Pole-mounted transformers
  - Overhead lines
  - Distribution system equipment: electrical load
  - Medium voltage grid automation
  - Distribution Automation for Fault Detection
  - Isolation and restoration
  - Grid Monitoring (e.g. Intelligent substations)
  - Protection & Safety
  - Distribution Automation for Power Quality

Standards

- IEC 61010-1: 2010; IEC 61010-2-32: 2012
  IEC 61869-1: 2007; IEC 61869-6: 2016; IEC 61869-10: 2017
- UL (pending)