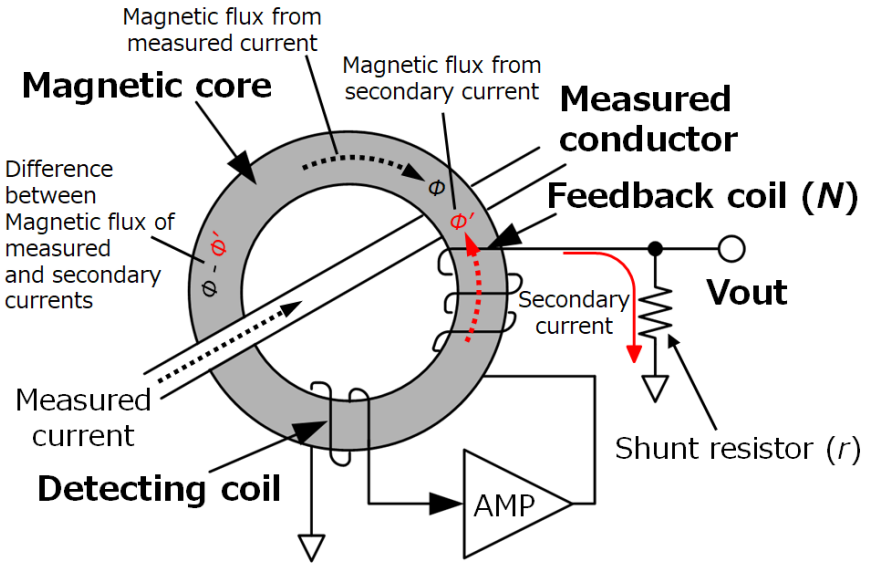
# Details of Current Sensors by Operating Principle
# ④ Zero Flux Method (Coil Detection) (AC only)

## Characteristics

- Since sensor operation depends on canceling out the magnetic flux in the magnetic core, AC zero-flux sensors have excellent linearity and are not affected by the magnetic core's *B-H* magnetic characteristics.
- Well-suited for use in high accuracy power measurement since they are characterized by small phase error, even at low frequencies.
- Since AC zero-flux sensors operate using the CT of the secondary feedback winding in the high-frequency region, and utilize an amplifier for the low-frequency region, a broad frequency bandwidth is supported.
- Dedicated to AC (DC not supported)




## Measurement Principle

- In the zero-flux method, in order to cancel out the magnetic flux (*Φ*) produced inside the magnetic core by the AC current flowing in the conductor being measured, a secondary current flows to the secondary side of the feedback winding inducing a secondary magnetic flux (*Φ'*).
- However, in the low-frequency regions, the magnetic flux (*Φ*-*Φ'*) cannot be cancelled and thus remains in the magnetic circuit.
- The detecting coil detects this remaining magnetic flux (*Φ*-*Φ'*). Then, a secondary feedback current is added through an amplifier circuit so as to cancel out the magnetic flux (*Φ*-*Φ'*) in the low Hz regions.
- This secondary current flows to the shunt resistor, producing a voltage across its terminals.
- The voltage is identified as proportional to the current flowing in the conductor being measured, giving us the true current level.

## Hioki Zero Flux Method (AC only) Sensors

9272-10, 9272-05