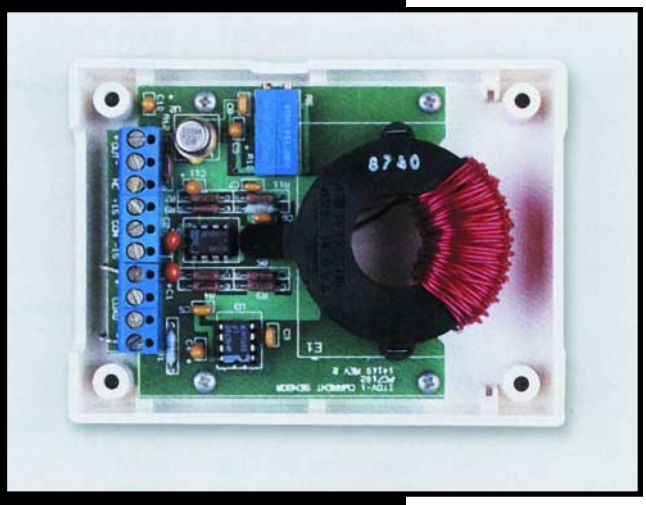
IT0V-1

Non-Contact Current Sensor



- **Non-contact current measurements to 100 amps**
- **Signal isolation to 1kV**
- **0–2VDC output signal**
- **Field configurable for high amperage**

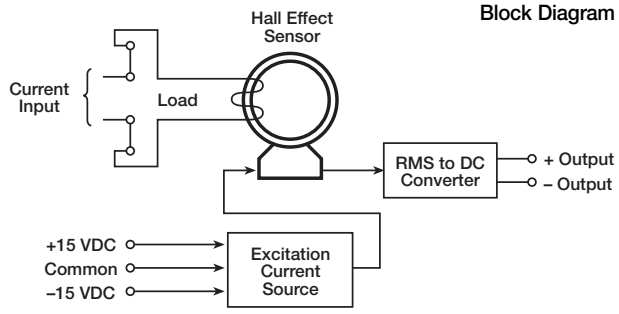
Ordering Information

IT0V-1 **Non-Contact Current Sensor**

APPLICATIONS

- **Measure AC & DC ground currents**
- **Pump and motor efficiency monitoring**
- **Maintenance scheduling**

Block Diagram



Keithley's IT0V-1 Current Sensor is a small, lightweight, ruggedly reliable and cost effective device employing advance Hall effect technology for non-contact AC and DC current measurements. A full scale range of 0–2A is provided. Additionally, the IT0V-1 may be configured for any full scale range to a maximum of 100A.

The IT0V-1 covers a wide range of industrial measurement applications such as pump and motor starting (surge) current, AC and DC ground currents, high voltage applications through non-magnetic insulated wire, and pump and motor efficiency.

The IT0V-1 consists of a split iron core toroid with a Hall generator placed in the toroid gap (split). As current passes through the iron core and the magnetic field builds, the toroid core concentrates the magnetic flux of the conductor (iron) to the Hall generator located within the core gap. The Hall voltage (output) is directly proportional to the strength of the magnetic firld generated within the iron core in response to magnitude of the current passing through the core. Input signals may be wired directly to LOAD terminals (+ and –) of the IT0V-1 or for larger currents, the current carrying wire may be passed directly through the opening in the iron core.

The IT0V-1 requires excitation in the range of +12 through +15 VDC @ 45mA and –12 through –15 VDC @ 5mA.

Voltage Output Calculations

The IT0V-1 accepts input signals from DC to 1kHz and converts the throughput current to a 0–2 VDC output signal according to the following formula:

INTERNAL WINDINGS: Output Signal = 1 VDC/A rms (factory configuration)

EXTERNAL WINDINGS: Output Signal = N/50 VDC/A rms
where N = number of turns through toroid core (box).

NOTE: The input frequency is from 1kHz to DC, the current flow direction (+ or –) is not indicated. Also, as the input frequency approaches 1kHz, the wire (windings) around the sensor creates an inductive reactance, resulting in several volts appearing across the load terminals at the 2A max. load current. This 1kHz anomaly may be overcome by removing the internal windings and VERY LOOSELY wrapping the 50 turns around the outside of the case and through the center of the toroid. This "loose" wrapping will lower the reactive effect of the coil.

Specifications

SIGNAL INPUT RANGE: 0–2A (internally wound); 0–100A (externally wound).
SIGNAL ISOLATION VOLTAGE: 1kV (max.).
INPUT FREQUENCY RANGE: DC to 1kHz.
OUTPUT VOLTAGE: 0–2 VDC.
ACCURACY @ 25°C: 1% of reading ± 10mV.
ACCURACY OVER TEMPERATURE: ±0.10% per °C.
RESPONSE TIME: 100ms (99%).
ADJUSTMENTS: Gain (R10) and Offset (R6).

POWER

POSITIVE SUPPLY: +12 to +15 VDC @ 45mA.
NEGATIVE SUPPLY: –12 to –15 VDC @ 5mA.

ENVIRONMENTAL

DIMENSIONS: 7.95cm × 10.8cm × 3.81cm (3.13 in × 4.25 in × 1.5 in).
WEIGHT: 218g (7.7 oz).
OPERATING TEMPERATURE: 0° to 70°C.

Measures AC and DC currents without physical contact

SIGNAL CONDITIONING

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