Open Loop Hall Effect Current Sensors/Transducers

1. Measuring Principle

- Primary current $I_p$ applied on core, causing Hall voltage rise thanks to the magnetic induction generated on core.
- $I_c$ is a constant current source to supply Hall sensor. It makes Hall sensor under constant operation condition.
- Output voltage $V_o$ then is proportional to $I_p$. This means that the output can get a very good linearity before core and OP saturation.

2. Characteristics and Features

**Measurable Current Range:**
About 3 times of rated current

**Output Signal:**
It is directly proportional to the measured current, both DC and AC measurable. General voltage output $V_o$ is 4V at the rated (nominal) current $I_{rated}$. Different $V_o$ versions are also available

**Measurement Accuracy:**
Depends on ambient temperature, operating temperature and some other electrical parameters. Our current sensors are factory-calibrated (offset and gain voltage) at an ambient temperature of 25°C

3. Dynamic Properties

a. Response time

- **Definition:**
The delay time between 90% of measurable current range (3 times of rated current) and sensor output reaches the coordinated voltage

- **specification:**
Chenyang open loop current sensors have the Best performance thanks to our best design of layout and well selection of high slew Rate amplifier.
b. Noise Response

- Voltage pulse applied 300~600V/µs on primary conductor
- With control power supply
- Measuring output voltage ($V_o$), specification depends on the application situation. However the smaller, the better
- Chenyang open loop current sensors have the excellent low output voltage ($V_o$) in comparison with other sensors.

c. Output voltage ($V_o$) linearity:

- The output voltage versus input current relation of an ideal current sensor (without setting error in residual and output voltage) is indicated by the dot line in right figure
- The continuous line shows the output/input relation of an actual sensors.

4. Output Voltage ($V_o$) Performance (at Rated Current 50A)

- Offset standard specification: 40mV
- Output voltage ($V_o$) standard specification: ±4V ±0.04V

5. Typical Applications

- General Purpose Inverter
- AC/DC Variable Speed Drivers
- Battery Supplied Applications
- Uninterruptible Power Supplies
- Switched Mode Power Supplies