

ISSUE: [July 2026](#)

High-Precision AC-DC Current Transducer Challenges Hall-Effect Sensors On Price Too

[Danisense](#)'s MBC4000I is a compact fluxgate ac-dc current transducer offering high-precision current measurements of up to 4000 A and more. The device delivers measurement performance levels up to 10 times higher than conventional Hall-effect transducer solutions currently on the market, yet only costs slightly more than a Hall-effect sensor. See the figure.

Built on Danisense's stable closed-loop fluxgate technology, the product provides exceptional accuracy below 0.05% over the temperature range from -20°C up to +85°C, ultra-low sensitivity drift and reliable current output performance. Featuring a large Ø121-mm aperture for busbar applications, a 1:5000 primary-to-secondary ratio, and minimal offset drift over temperature, the transducer is well suited for demanding high-current measurement environments.

The MBC4000I takes advantage of a current transformer (CT) design that the company introduced a few months ago with the MK500ID clamp-on CT. That product simplified the fluxgate transducer design from three cores to one for the purpose of achieving the clamp-on functionality. However, that design when applied to a solid-core transducer (without the clamping action) like the MBC4000I, reduces the cost of the product, enabling it to compete with the less accurate, but less costly Hall-effect sensors. (For more on the MK500ID, see "[High-Precision DC And AC Current Transducer Comes In Clamp-On Form](#)".)

Loic Moreau, sales and marketing director at Danisense, observes that a traditional fluxgate CT would typically cost 4x to 5X that of a Hall effect sensor. However, with the new single core design employed in the MBC4000I, the price of the CT is just 10% to 15% above a comparable Hall effect sensor. Meanwhile, as Moreau says, the accuracy of the CT is much higher.

Moreau notes that the CT has a special advantage in measuring low current levels with high accuracy. For example at just 5% of the nominal current, the CT can measure an error of just 0.4%.

"As the global energy transition drives widespread electrification across a broad range of applications, the demand for higher power generation and consumption continues to increase. This trend has created a growing need for current measurement solutions capable of accurately monitoring currents of 4,000 A and above," says Moreau.

He continues, "At the same time, the pursuit of enhanced power converter performance—particularly in terms of power quality, efficiency, and system stability—requires current measurement technologies that deliver superior accuracy, long-term stability, and minimal temperature dependence. In many high-performance applications, conventional closed-loop Hall-effect current transducers are reaching their practical limits with respect to linearity, offset drift, and measurement precision."

"And this exactly is what prompted our design engineers to revisit and re-engineer Danisense's fluxgate measurement principle, resulting in this new generation of current transducers that provide measurement performance up to ten times greater than that of traditional Hall-effect sensors," Moreau concludes.

The table offers a comparison of the MBC4000I fluxgate ac-dc current transducer with a traditional Hall-effect transducer.

For more information, see the MBC4000I [page](#) or contact the [company](#).



Figure. The MBC4000I, a new fluxgate generation ac-dc current transducer, offers high-precision current measurements of up to 4000 A and more with accuracy up to 10 times higher than a traditional Hall-effect transducer. Measurement error is below 0.05% over temperature from -20°C up to +85°C. It also offers ultra-low sensitivity drift and a large Ø121-mm aperture for busbar applications.

Table. The MBC4000I fluxgate ac-dc current transducer vs. Hall-effect sensor.

	Hall Effect Closed Loop	MBC4000I
Supply voltage	+/- 24 V	+/- 24 V
Operating temperature	-25 to +70	-40 to +85
Ratio	5000	5000
Nominal DC current	4000 A	4000 A
Nominal AC current	4000 A rms	4000 A rms
Measuring range	6000 A	6000 A
Current consumption at nominal	0,827	0,9
Total error	0,80%	0,05%
Offset error (primary referred)	4 A	0.4 A
Temperature variation (Primary referred)	4 A	0.4 A
Magnetic offset change after 3 x nominal current	1 A	0.4 A
Linearity error (referred to nominal)	0,20%	0,01%
Frequency bandwidth (-3dB)	100 kHz	100 kHz
Aperture size	102 mm	121 mm
Size (W x H x D)	215 x 234 x 103 mm	218 x 238 x 89 mm
Mass	6000 g	4100 g