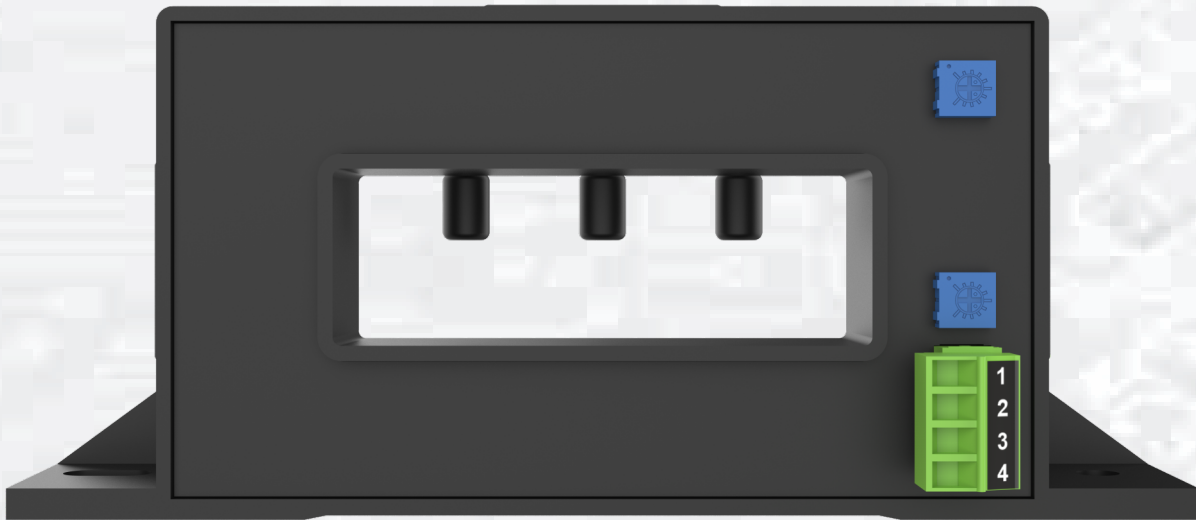




Technical Data Sheet

Theta HCS Series Hall Current Sensor



Theta HCS Series Current Sensor is a sensor designed to convert input current signal into output voltage. The sensor converts a sinusoidal AC Current (Upto 25kHz frequency of the input signal) ,DC Current or Pulsating DC current into a corresponding output voltage proportional to the measured value. The sensor output is galvanically isolated from the input signal and auxiliary supply.

Application

- Variable speed drives for AC motors and servo motor control systems
- Power conversion units used for driving DC motors
- Systems powered by batteries for various applications
- Uninterruptible Power Supplies (UPS)
- Switched Mode Power Supplies (SMPS)
- Power units designed for welding operations

Product Features/ Benefits

- **Hall effect measuring principle:**

The sensor integrates Hall effect technology to deliver accurate measurements of current, using the generated Hall voltage for precise and reliable sensing performance.

- **Low insertion losses:**

The sensor offers low insertion losses, ensuring minimal signal degradation during transmission. This results in improved signal integrity and enhanced overall performance, making it ideal for high-precision applications.

- **Low power consumption:**

The sensor is designed with low power consumption, ensuring energy efficiency and extended operational life. This reduces overall energy costs while maintaining optimal performance for extended periods.

- **Only one design for a wide current rating range:**

The sensor offers a single, versatile design that accommodates a wide range of current ratings. This eliminates the need for multiple models, simplifying inventory management and ensuring consistent performance across different applications.

- **Reverse Supply Protection:**

The sensor offers a protection against the reverse supply connected at the supply terminals mainly interchange of the negative and the positive supply making it an additional benefit as it will avoid the issue of the sensor being damaged permanently

- **High immunity to external interference**

The sensor features high immunity to external interference, ensuring reliable performance even in challenging environments with electrical noise or signal disruption. This enhances accuracy and stability, making it ideal for sensitive applications.

- **Small size and space-saving:**

The sensor features a compact, space-saving design, making it easy to integrate into tight spaces without compromising performance. Its small size enhances versatility and allows for efficient use of available space in various applications.

Easy installation:

- The sensor is designed featuring a user friendly setup that requires minimal effort and time. This ensures quick deployment and reduces the downtime, making it hassle-free for users to integrate into their systems.

Technical Data

Measuring Input :

Type	Nominal Measuring RMS Current (IN)	Measuring RMS Current Range (IM) ²
Theta HCS500	±500A	±1500A
Theta HCS600	±600A	±1800A
Theta HCS850	±850A	±2550A
Theta HCS1000	±1000A	±3000A
Frequency bandwidth (-3 dB) ⁷	DC ... 25 kHz	
Overload Withstand	30000A @ 60 seconds	

Output Parameters :

Analog Output Voltage@ ±IN , RL=10 kΩ @25 °C ⁴	±4V
Output internal resistance	100Ω
Load Resistance @ Voltage Output	1kΩ<RL<10KΩ
Insulation resistance @ 500 V DC	> 1000MΩ

Auxiliary Supply :

Type	Bipolar
Auxiliary Supply Voltage ¹	±15V (±5%)
Auxiliary Current consumption @IN	>20mA

Accuracy & Applicable Standards :

Reference Condition for Accuracy@ 25°C

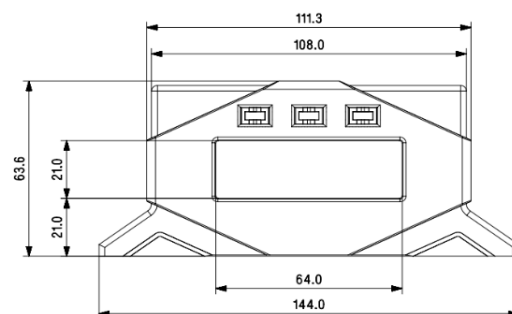
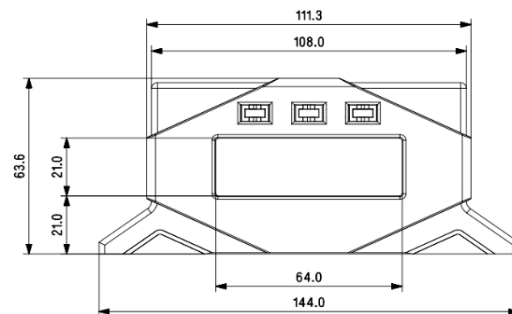
Accuracy Parameters

Error @IN, (excluding offset)	<±1 % of IN
Linearity error (Excluding offset) ^{a 5}	<±1 % of IN
Electrical offset Output Voltage	< ±20 mV
Hysteresis offset voltage @ IN = 0, after an excursion of 1 × IN	< ±30 mV
Temperature coefficient of offset Output Voltage	<±1 mV/K
Delay time to 90 % of the final output value for IN step ³	<5us

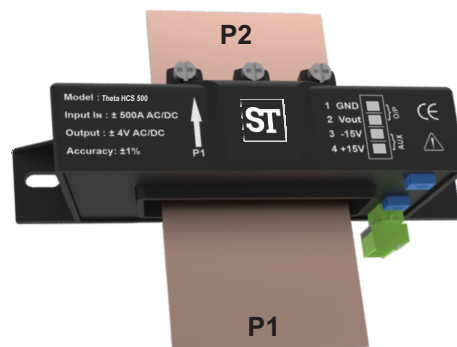
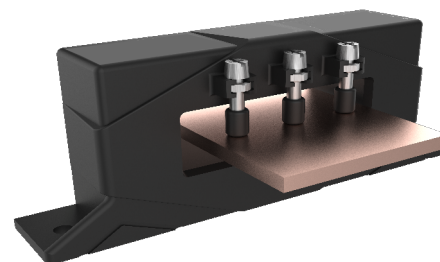
NOTES:

- 1) The measuring range will be reduced if auxiliary voltage $\pm 12\text{ V} < V < \pm 15\text{ V}$
- 2) To use the device at maximum measuring range auxiliary voltage = $\pm 18\text{ V}$
- 3) For a di/dt of 50 A/μs.
- 4) Accuracy class within $\pm 5\%$ for EMI EMC conditions
- 5) The linearity data excludes the electrical offset.
- 6) Vout is positive when IN flows in the direction indicated by the arrow.
- 7) Refer User Manual for more Technical Information.

Dimensional Drawings



Busbar Mounting Guidelines



- a) It is recommended to fix the primary busbar at the center of the aperture as the accuracy of the sensor is influenced by the position of the busbar.
- b) The temperature of the primary conductor must not exceed 100 °C.^b

Standards

IEC 60068-2-1	Vibration Test
IEC 60068-2-6	Cooling test
IEC 60068-2-14	Temperature Cycle Test
IEC 60068-2-32	Free fall
IEC EMC 61000-4-3	Radiated electromagnetic field immunity test
IEC EMC 61000-4-4	EFT Test
IEC EMC 61000-4-6	Immunity to conducted disturbances induced by radio frequency fields
IEC EMC 61000-4-8	PFMF

Safety

Applicable Standard	IEC 62477-1
Installation Category	III
Over voltage Category	3
Protection Class	II
Pollution Degree	II
Insulation Test Voltage	5kV,50Hz,60 secs
Impulse Withstand Voltage	1.2/50us - 8.3kV
Creepage Distance	15.7mm
Clearance Distance	12.7mm
Comparative Tracking Index (Group I)	600V
Altitude	Up to 2000m



This Sensor must be used in limited-energy secondary circuits according to IEC 62477-1.



The Sensor must be used in electrical/electronic equipment in compliance with relevant standards and safety regulations, following the manufacturer's operating instructions.

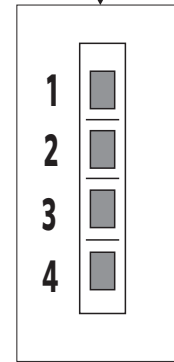
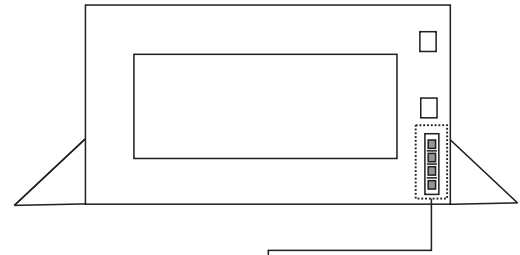
Caution, risk of electrical shock

During operation, certain parts of the module, such as the primary busbar and power supply, may carry hazardous voltage. Ignoring this warning could lead to injury or serious damage. The Sensor is a built-in device, and its conductive components must be inaccessible after installation. A protective cover or additional shielding may be required. The main power supply must be disconnectable.

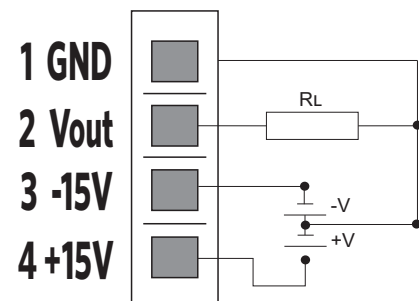
Environmental Condition

Operating Temperature	-20 to 80 °C
Storage Temperature	-40 to 85 °C

Connector Details



- (1) GND - Ground
- (2) Vout - Output Voltage
- (3) -15V - Negative Supply
- (4) +15V - Positive Supply



Mechanical Characteristics

General tolerance	±1 mm
Sensor fastening	1 hole and 1 notch Ø 5.5 mm/ 2 M4 steel screws
Recommended fastening torque	1.5 N-m or 3 screw mounting or 3 M4 steel screws
Recommended fastening torque	1.5 N-m
Connection of Secondary	XY2500 FC4, Female Terminal

Installation

Enclosure Material	Polycarbonate, Flammability Class V-0 acc. to UL 94
Dimensions (in mm)	W:144 x H:62 x D:26
Primary Through Hole	64*21 mm
Weight	450g approx
Mounting	Wall mounting

Ordering information

Product Code	CW50-	XX	01	01	00000ST
Variant	Theta HCS 500- For 500A	01			
	Theta HCS 600- For 600A	02			
	Theta HCS 850- For 850A	03			
	Theta HCS 1000- For 1000A	04			
Auxiliary Supply	±15 V		01		
Output Voltage	±4 V			01	

** Required external aux supply can be provided at an extra cost upon requirement

Order Code Example

CW50-0101010000ST - Hall Effect Sensor Theta HCS500 : NOMINAL CURRENT: ±500A,
±15V Auxiliary Supply Voltage, ±4V Output Voltage



Sifam Tinsley Instrumentation Inc.
2105, Barrett Park Dr. Unit 105.
Kennesaw, GA 30144, USA
E-mail Id : psk@sifamtinsley.com
info@sifamtinsley.com
Web : www.sifamtinsley.com
Contact No. : +1 404 736 4903

Sifam Tinsley Instrumentation Ltd
Unit 1 Warner Drive,
Springwood Industrial Estate
Braintree, Essex, UK, CM72YW
E-mail: sales@sifamtinsley.com
Web: www.sifamtinsley.com/uk
Contact: +44(0)1803615139