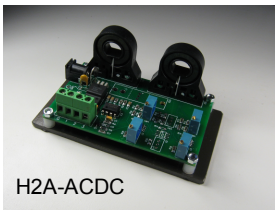
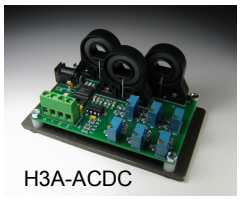
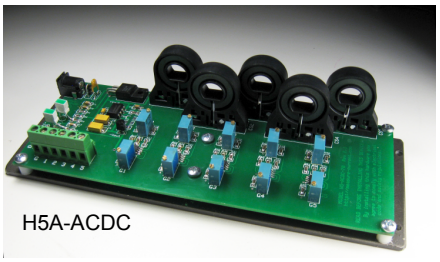


2 Channel Adjustable Current Sensor



3 Channel Adjustable Current Sensor



5 Channel Adustable Current Sensor

The HXA-ACDC-XX adjustable offset, adjustable gain series Hall effect current sensor transducer board delivers output voltage proportional to the amount of current detected in the wire being measured.

This type of sensor is often preferred by system designers due to it's ability to provide electrical isolation from the line being monitored and also allows the end user to to strengthen the signal by simply looping the line through the sensor as many times is desired.

The HXA-ACDC-XX series differs from the HXB-ACDC-XX series because it has adjustable offset / adjustable gain span output. Each channel has a dedicated 22 turn offset pot and a 22 turn gain pot. It is a low cost solution and is well suited for data logging and instrumentation / data acquisition. This sensor is fed by a precision voltage regulator with a high quality linear response CSLA series Hall effect transducer made by Honeywell.

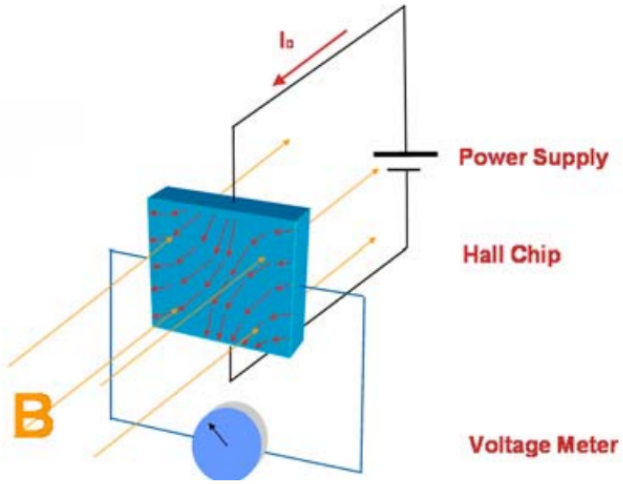
Assembled in the USA, Lead free ROHS compliant. Various mounting options are availble along with different options & Accessories available as a kit. Quantity discounts also available. (For more details see ordering guide)

Features

- Voltage polarity protection on supply excitation input.
- Wide input power range
- Linear output
- AC or DC current sensing
- Over current protection
- Fast response time
- Output voltage isolation from input
- Minimum energy dissipation
- Maximum current limited only by conductor size
- Adjustable performance and built-in temperature compensation assures reliable operation
- Accurate, low cost sensing
- Operating temperature range -25 °C to 85 °C
- Sturdy open frame mounting

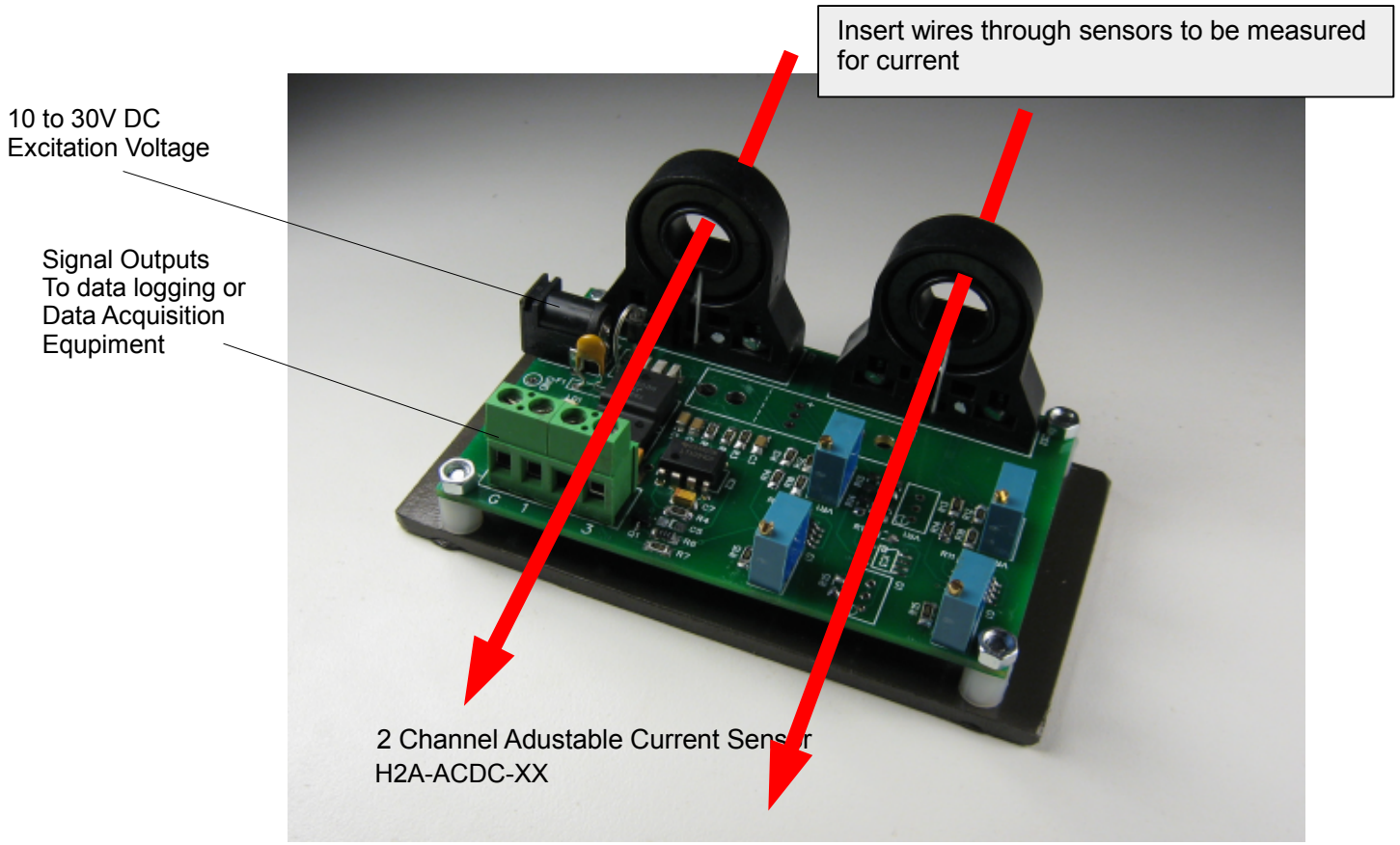
Typical Applications

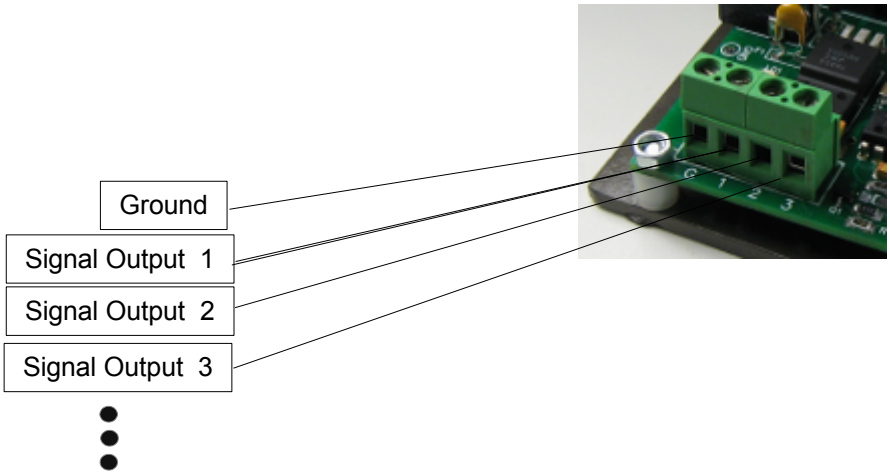
- Data Acquisiton hw / sw inlcuding LabVIEW
- Solar panel monitoring
- Bicycle generator monitoring
- Wind turbine monitoring
- Battery charging
- Variable speed drives
- Overcurrent protection
- Ground fault detectors
- Current feedback control systems
- Robotics
- UPS and telecommunication power supplies
- Welding power supplies
- Automotive - Battery management systems
- Wattmeters



CONNECTION DIAGRAM

Recommended Wire: 20 to 28 AWG Stranded, Shielded, Twisted Pair





SENSOR SETUP:

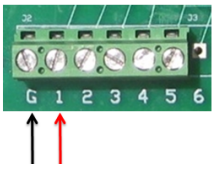
MEASURING DC AMPS:

For example, if your data logger has a voltage input range of 0 to 5 Volts and the max DC current you are expecting to see is 50 Amps, then you would adjust your V offset so your output is at zero volts when there is no current flowing through the wire. Next you would adjust your gain so that at 50 Amps DC, your sensor puts out 5 volts. Next there are two ways to accomplish this. (1) If you have a DC power supply that can put out 50 Amps of current, then turn it on at 50 Amps, and adjust your gain for each sensor so that your dc volt meter reads 5 Volts for each sensor.

STEPS TO ADJUST GAIN WHEN NO CONSTANT CALIBRATED CURRENT SUPPLY EXISTS

Why would you want to do this adjustment? ANSWER: To get the highest resolution from your data acquisition system or data logger.

STEP 1: Set a volt meter to read DC voltage. Use a small screw driver to loosen the screws shown at G and 1. Insert the probes for your volt meter into the terminals as shown. These output terminals correspond to CS1 as marked on the board. (CS1 means “Current Sensor 1”)



STEP 2: Next make sure that you adjust the gain potentiometer to its furthest most counter clockwise position. The 22 turn potentiometer shown here is labeled G1. This corresponds to current sensor 1. One way to tell you have reached the furthest most position of the potentiometer is that you will hear a small clicking noise as the wiper runs off the end of the resistor coil. You will also know if your DC Volt reading stops decreasing. By adjusting the gain resistor to this position, you have essentially adjusted gain to its smallest setting of 1X**.**

CURRENT SENSOR SETUP (Continued)

STEP 3: If you have the model H5-ACDC-70, then adjust the V Offset potentiometer so that your DC volt meter reads ~0.041mV DC. If you have the model H5-ACDC-125 then set your offset voltage at ~0.024mV DC. For instance if you want to adjust the channel 1 current sensor Voltage offset, then you would adjust VR1 as shown in the photo.

NOTE: At this point have fooled the amplifier circuit into thinking that the current sensor is reading one Amp of current because you have set the offset up just enough to make it look like you are monitoring 1 amp of current.

STEP 4: Now you need to use this formula to figure out what your gain should be.

0.041V x G X 72A = 5 Volts.

Solving for "G" you get a gain of 1.7 So now with your volt meter reading ~0.041, adjust the gain on your potentiometer until your DC voltage reads

*1.7 X 0.041 = 0.069*VDC

This gain value will make it so that your sensor will put out 5 Volts when it sees a 50 Amp Current.

STEP 5: Now return your offset to zero using the VR potentiometer. This completes the setup steps for measuring a DC current of 50 Amps max.

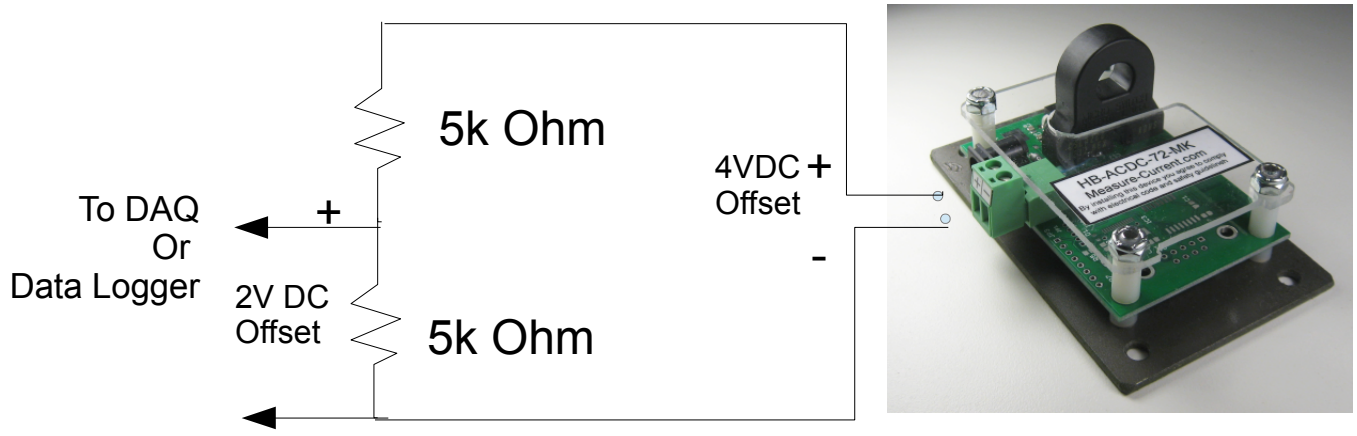
MEASURING AC:

If you want to measure 50 Amps AC, and your data logger has a 0 to 10 Volt input range, then you would adjust your offset so that it sits at 5 Volts. Then adjust your gain so that the signal will hit 10 Volts at 50 Amps and 0 Volts at -50 Amps.

If your data logger has a -5 to +5 voltage input range, then you would adjust the offset to zero volts to read an AC signal. Also if your signal is week, then loop the wire around the sensor multiple times and adjust the gain to its max setting.

APPLICATION NOTES:

- When monitoring purely AC current with zero DC component, a capacitor can be inserted in series with the output of the current sensor. The capacitor will block out the effect of the temperature variation of the offset voltage which increases the accuracy of the device.
- If your data acquisition has an analog input range smaller than the output range of the HXA-ACDC sensor then you can use two 5k resistors in a voltage divider configuration to divide down the signal by half. Ses voltage divider schematic diagram below.



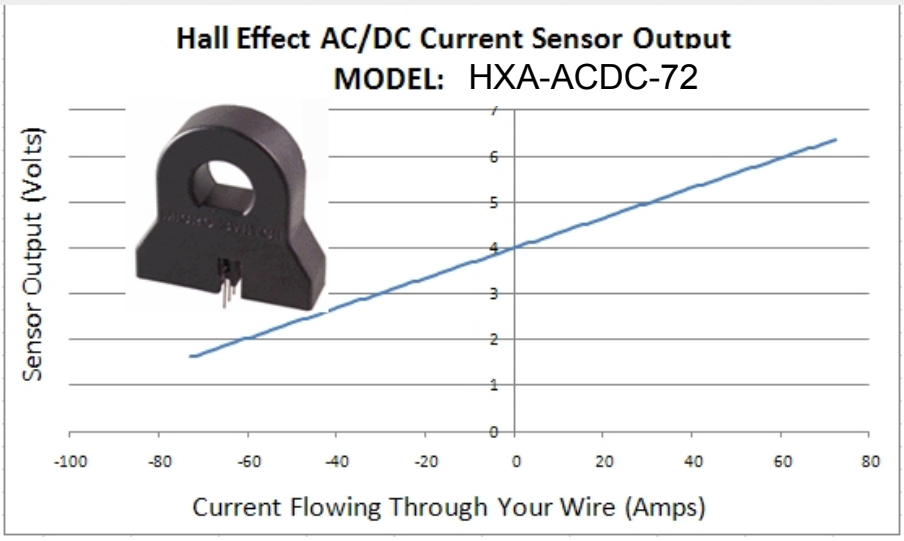
Dividing signal down using 10k Ohm voltage divider circuit

In the case above the default offset voltage will be ~2.0 VDC and the transducer sensitivity will be half of the value shown in the specifications. For example, if it is a HXA-ACDC-72 we are looking at the following behavior will occur:

Sensor Output		Approx. Current
2.000 V	=	~0.0 Amps
2.016 V	=	~1.0 Amps
1.084 V	=	~-1.0 Amps
2.032 V	=	~2.0 Amps
2.320 V	=	~20 Amps

Note:

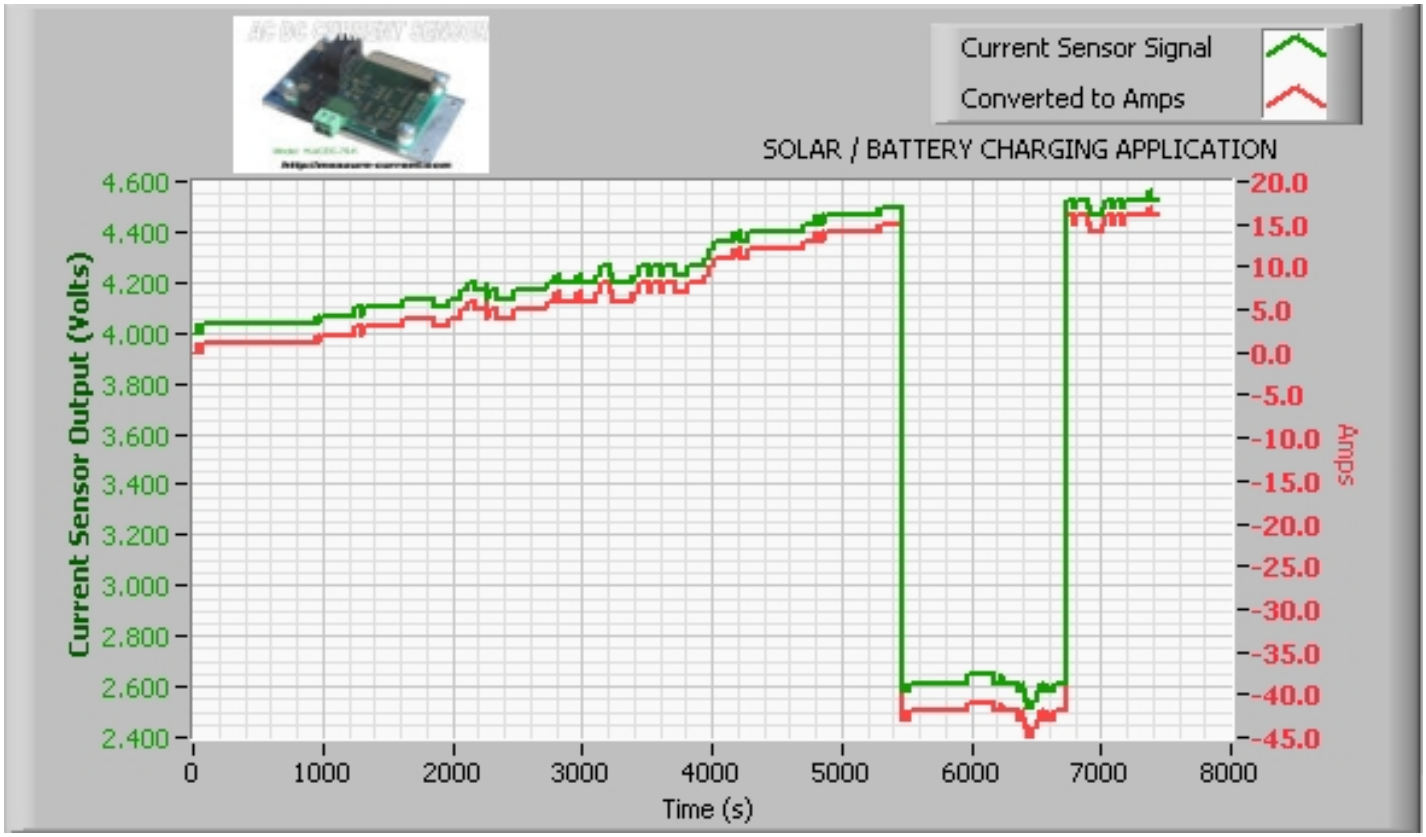
If a variable division control is desired then use a 10k potentiometer in the circuit above. If you need help with setting this up contact support@measure-current.com or dial the number on the website.



ANALYSIS of EXAMPLE DATA FROM SENSOR

Below you can see data from a solar panel / battery charging application. The green trend line represents data from the sensor. The red trend line has been converted to Amps using the following linear equation. Amps = (Vsensor - 4.0) / ~32mV for the HXA-ACDC-72 model.

As the sun comes up, current slowly flows into the batteries rising from 4 Volts DC to 4.5V DC. This corresponds to a current range of Zero amps up to 16 Amps shown in red on the right side of the graph.



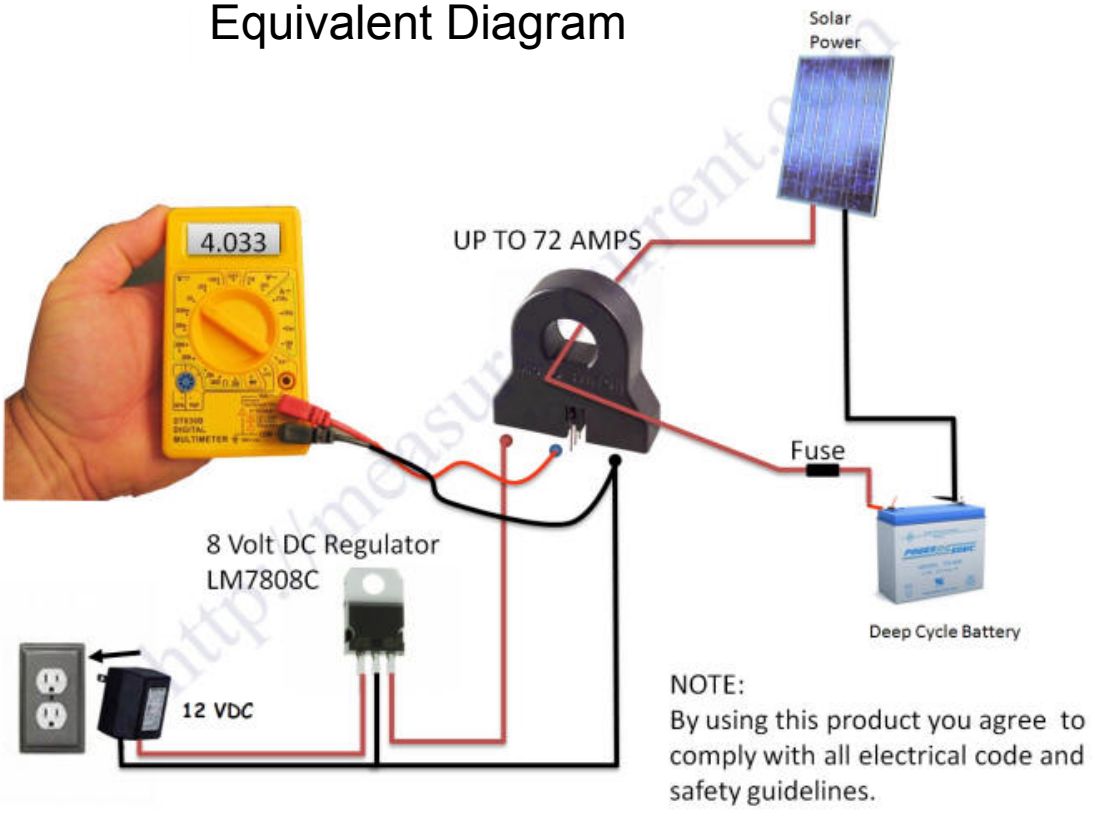
Example Data Cont'd

When someone in the home turns on an electric appliance then the current goes negative down to 2.6 Volts DC because it changes direction as it flows from the batteries into the House AC inverter which could be powering something like a refrigerator or washing machine.

A value of 2.6 Volts DC output converts to a current value of ~ -45 Amps. Assuming these batteries are setup in a 24 Volt configuration, then you could use this current measurement to approximate how much power your batteries are putting out. In this case it would be about 1,080 Watt power output to the inverter.

(24V X 45A = 1080 Watts)

Equivalent Diagram



In this diagram the HXA5-ACDC-72 is connected to a Volt meter which reads 4.033 which is the equivalent of about 1 Amp of current.

DIMENSIONS

Available upon request.

SPECIFICATIONS

Product Type	Inductive Analog Current Sensor
Sensed Current Type	ac or dc
Sensed Current Range	HXA-ACDC -72 ±72 A HXA-ACDC -125 ±125 A
Package Type	PCB Bottom Mount
Output Type	HXA-ACDC -72 ~ 1.64 to 6.35 HXA-ACDC -125 ~ 1.55 to 6.45
Sensitivity (N = Number of Turns)	HXA-ACDC -72 32.7 mV N ±3.0 mV N HXA-ACDC -125 19.6 mV N ±1.3 mV
Default Offset Output (Zero Amps)	4.0 DC ± 0.15
Supply Current	20 mA max.
Supply Voltage (Input excitation voltage range)	10 Vdc to 30 Vdc
Power Connector	2.5mm ID power plug or screw terminals
Offset Shift	±0.02
Response Time	3 µs
Operating Temperature	-25 °C to 85 °C [-13 °F to 185 °F]
Storage Temperature	-40 °C to 100°C [-40 °F to 212 °F]
Sensor Housing Material	PBT Polyester
Mounting	Screws into panel or DIN rail option
Availability	Global
Weight	3.4 oz mounted to plate 1.4 oz not mounted
Series Name	HXA-ACDC-XX
Sensor Inside Dimensdion	0.43”

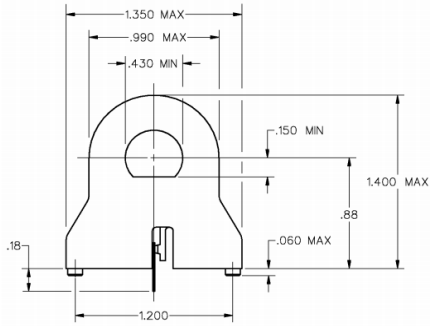
Note: This sensor outputs an AC signal for AC Current measurements.

HXA SERIES – ADJUSTABLE OFFSET & GAIN SPAN GUIDE

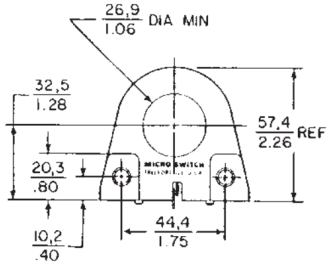
Model (Part Number)	Current Range	Number of Sensor Channels	Includes Mounting Kit Plate (MK)	Includes 12DC Power Supply (PS)	Din Rail Compaitible PSE-BRKT-2 (DIN)
HXA-ACDC-72	-72 to +72	1			
HXA-ACDC-72-MK	-72 to +72	1	✔		
HXA-ACDC-72-MK-PS	-72 to +72	1	✔	✔	
HXA-ACDC-72-DIN	-72 to +72	1			✔
HXA-ACDC-125	-125 to +125	1			
HXA-ACDC-125-MK	-125 to +125	1	✔		
HXA-ACDC-125-MK-PS	-125 to +125	1	✔	✔	
HXA-ACDC-125-DIN	-125 to +125	1			✔
HXA-ACDC-950	-950 to +950	1			
H2A-ACDC-72-MK	-72 to +72	2	✔		
H2A-ACDC-125-MK	-125 to +125	2	✔		
H3A-ACDC-72-MK	-72 to +72	3	✔		
H3A-ACDC-125-MK	-125 to +125	3	✔		
H5A-ACDC-72-MK	-72 to +72	5	✔		
H5A-ACDC-125-MK	-125 to +125	5	✔		

Hall Effect Sensor Dimensions

HXA-ACDC-72
HXA-ACDC-125
(0.43” inside diameter)



HXA-ACDC-950
(1” inside diameter)



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- High speed data manipulation
- Solar power monitoring
- Wind Turbine power monitoring.

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