

## Hall Effect DC Current Sensor CYHCT-HBC

This Hall Effect current sensor is based on open loop principle and designed with a high galvanic isolation between primary conductor and secondary circuit. It can be used for measurement of DC current, DC pulse currents etc. The output of the transducer reflects the real wave of the current carrying conductor.

Product Characteristics	Applications
<ul style="list-style-type: none"> <li>• Excellent accuracy</li> <li>• Very good linearity</li> <li>• easy mounting</li> <li>• Less power consumption</li> <li>• Window structure</li> <li>• Electrically isolating the output of the transducer from the current carrying conductor</li> <li>• No insertion loss</li> <li>• Current overload capability</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Photovoltaic equipment</b></li> <li>• Frequency conversion timing equipment</li> <li>• Various power supply</li> <li>• Uninterruptible power supplies (UPS)</li> <li>• Electric welding machines</li> <li>• Transformer substation</li> <li>• Numerical controlled machine tools</li> <li>• Electric powered locomotive</li> <li>• Microcomputer monitoring</li> <li>• Electric power network monitoring</li> </ul>

### Electrical Data

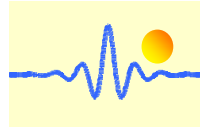
Primary Nominal DC Current $I_r$ (A)	Measuring Range (A)	DC Output Current (mA)	Window Size (mm)	Part number (see application notes on page 3)
2000	0~±2000	4-20 ±1.0%	140 x 50	CYHCT-HBC-U/B2000A-n
3000	0~±3000			CYHCT-HBC-U/B3000A-n
4000	0~±4000			CYHCT-HBC-U/B4000A-n
5000	0~±5000			CYHCT-HBC-U/B5000A-n
6000	0~±6000			CYHCT-HBC-U/B6000A-n
8000	0~±8000			CYHCT-HBC-U/B8000A-n
9000	0~±9000			CYHCT-HBC-U/B9000A-n
10000	0~±10000			CYHCT-HBC-U/B10000A-n

(U: unidirectional input current; B: bidirectional input current, please give U or B in Part number)  
(n=3,  $V_{cc} = +12VDC \pm 5\%$ ; n=4,  $V_{cc} = +15VDC \pm 5\%$ ; n=5,  $V_{cc} = +24VDC \pm 5\%$ )

Supply Voltage	$V_{cc} = +12V, +15V, +24VDC \pm 5\%$
Output current:	4-20mADC
Current Consumption	$I_c < 25mA + \text{Output current}$
Galvanic isolation, 50/60Hz, 1min:	3kV rms
Isolation resistance @ 500 VDC	> 500 MΩ

### Accuracy and Dynamic performance data

Accuracy at $I_r$ , $T_A = 25^\circ C$ ,	$X < \pm 1.0\% \text{ FS}$
Linearity from 0 to $I_r$ , $T_A = 25^\circ C$ ,	$E_L < \pm 0.5\% \text{ FS}$
Electric Offset current, $T_A = 25^\circ C$ ,	4mA DC or 12mA DC
Thermal Drift of Offset Current,	$< \pm 0.005mA/^\circ C$
Response Time at 90% of $I_P$	$t_r < 1ms$
Load resistance:	80-450Ω
Frequency Bandwidth (-3dB),	$f_b = DC - 20 \text{ kHz}$
Case Material:	PBT

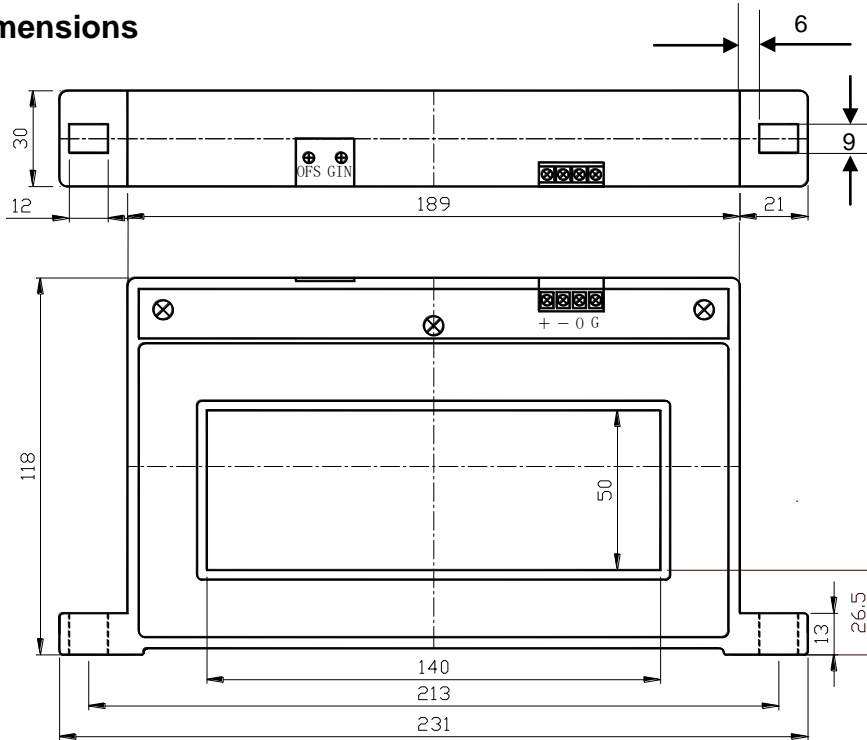


## General Data

Ambient Operating Temperature,  
Ambient Storage Temperature,

$T_A = -25^\circ\text{C} \sim +85^\circ\text{C}$   
 $T_S = -40^\circ\text{C} \sim +100^\circ\text{C}$

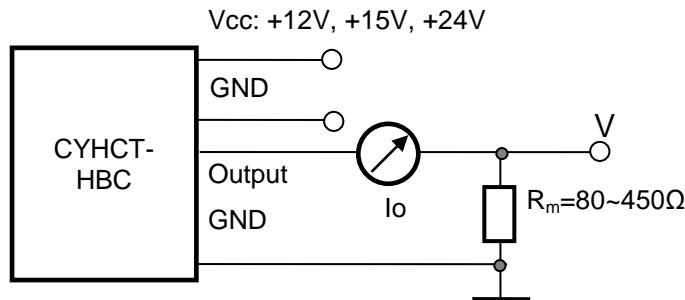
## Dimensions



### Pin Arrangement

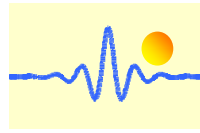
+: Vcc  
-: Ground (GND)  
O: Output  
G: Ground (GND)

GIN: gain adjustment  
OFS: offset adjustment



## Notes:

1. Connect the terminals of power source, output respectively and correctly, never make wrong connection.
2. Two potentiometers can be adjusted, only if necessary, by turning slowly to the required accuracy with a small screwdriver.
3. The best accuracy can be achieved when the window is fully filled with bus-bar (current carrying conductor).
4. The in-phase output can be obtained when the direction of current of current carrying conductor is the same as the direction of arrow marked on the transducer



## Application Notes

### 1) Part number CYHCT-HBC-U/BxxxxA-n

**U:** unidirectional input current; **B:** bidirectional input current; **xxxx:** current value; **n:** power supply (**n=3**,  $V_{cc} = +12VDC \pm 5\%$ ; **n=4**,  $V_{cc} = +15VDC \pm 5\%$ ; **n=5**,  $V_{cc} = +24VDC \pm 5\%$ )

**Example 1:** CYHCT-HBC-U2000A-5 Hall Effect DC Current sensor with  
Output signal: 4mA - 20mA DC  
Power supply: +24V DC  
Rated input current: 0 - 1000A DC (unidirectional)

**Example 2:** CYHCT-HBC-B2000A-3 Hall Effect DC Current sensor with  
Output signal: 4mA – 12mA - 20mA DC  
Power supply: +12V DC  
Rated input current: -1000A - 0 - +1000A DC (bidirectional)

### 2) Relation between Input current and output signal

Current Sensor CYHCT-HBC-U2000A-5		
Input current (A)	Output current $I_o$ (mA)	Output voltage $V_o$ (V) (Measuring resistance $R_m=250\Omega$ )
0	4	1
500	8	2
1000	12	3
1500	16	4
2000	20	5

Current Sensor CYHCT-HBC-B2000A-3		
Input current (A)	Output current $I_o$ (mA)	Output voltage $V_o$ (V) (Measuring resistance $R_m=250\Omega$ )
-2000	4	1
-1500	6	1.5
-1000	8	2
-500	10	1.5
0	12	3
500	14	3.5
1000	16	4
1500	18	4.5
2000	20	5