

ChenYang
Technologies GmbH & Co KG

Catalogue

Hall Effect Voltage Sensors

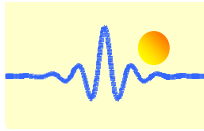
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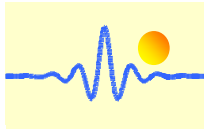
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Hall Effect Voltage Sensors CYHVS025A, CYHVS10-20A, CYHVS5-25A and CYHVS025T

CYHVS025A, CYHVS10-20A, CYHVS5-25A and CYHVS025T are Hall Effect Voltage sensors, which are based on closed loop and magnetic compensation principle. These sensors can be used for measuring DC and AC voltage with different wave forms. They have high electric isolation.

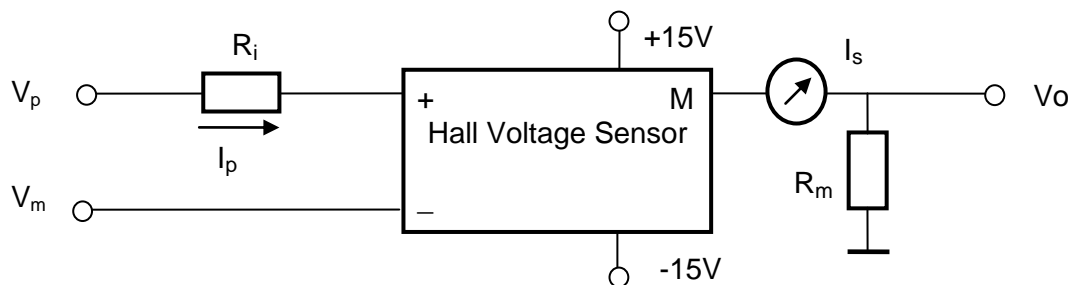
Features

- High electrical isolation
- High reliability
- Good overload capability
- Small sizes
- Insulated plastic case recognized according to UL94-V0
- Very good property-price ratio

Applications

- Switched Mode Power Supplies
- Uninterruptible power supplies (UPS)
- Overvoltage protection
- Feedback of control systems
- Electric power network monitoring
- AC frequency conversion servo-motors
- Various power supplies
- Power supply for welding applications

Measuring Principle

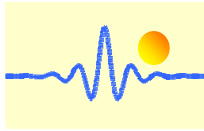


A magnetic field is generated by current I_p when a voltage ($V_p - V_m$) is applied on the input terminals of the sensor through the primary resistor R_i . This magnetic field is compensated with the reverse magnetic field caused by the current I_s in the secondary coil. The field compensation effect can be detected with a Hall Effect element. One obtains the following equation when the magnetic flux is zero:

$$N_p I_p = N_s I_s$$

where I_p : primary current; I_s : secondary current,
 N_p : primary turns, N_s : secondary turns.

The secondary current I_s is considered as output current of the sensor. Therefore the voltage ($V_p - V_m$) can be measured in this way under using the measuring resistor R_m .

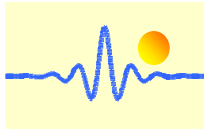


Hall Effect Voltage Sensor CYHVS025A

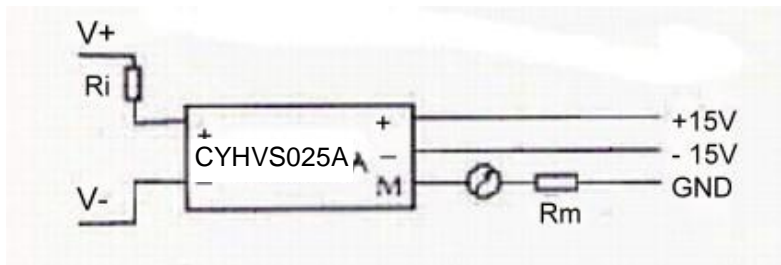
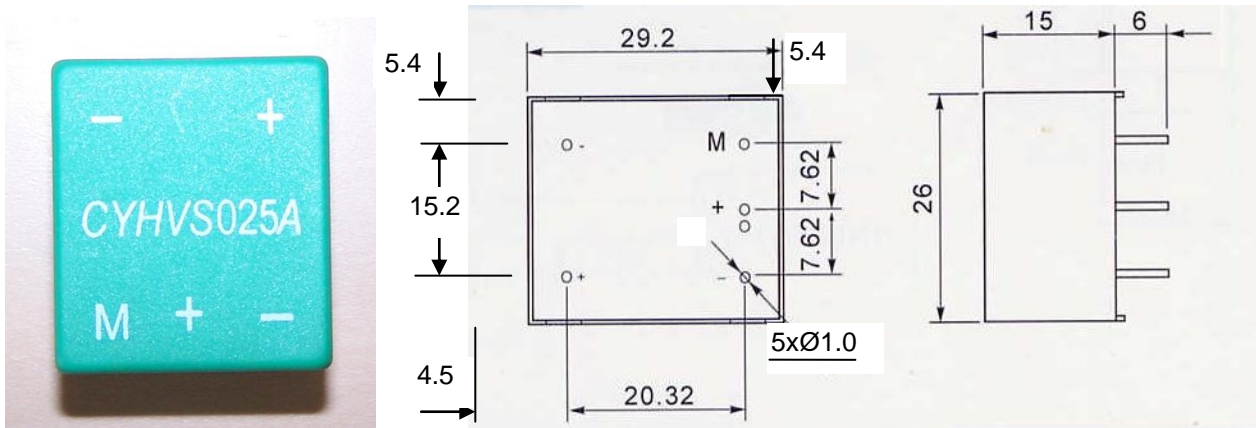
Electrical Parameters

Parameters	Values			Unit
Rated input current (I_N)	± 10			mA
Measuring range (I_P)	0 ~ ± 14			mA
Rated measuring voltage	500			V
Max. measuring voltage	1000			V
Measuring resistance (R_M)		R_{Mmin}	R_{Mmax}	
	@ ± 10 mA	100	350	Ω
	@ ± 14 mA	100	190	Ω
Rated secondary current (I_S)	± 25 ($\pm 0.5\%$)			mA
Power supply (V_C)	± 15 ($\pm 5\%$)			V
Turns ratio (N)	2500 : 1000			
Current consumption (I_C)	15 + I_S			mA
Isolation voltage (V_d)	2.5kV/50Hz/1min			
Measuring accuracy (X_G)	$\pm 0.8\%$ FS (see application note)			
Linearity (ϵ_L)	<0.2% FS			
Offset current (I_o)	± 0.1			mA
Thermal drift of offset current I_o (-40°C ~ +85°C)	± 0.5			mA
Response time (t_r)	<40			μs
Ambient operating temperature (T_A)	- 40°C ~ +85°C			
Ambient storage temperature (T_S)	-40°C ~ +125°C			
Primary coil resistance (R_p)	@ $T_a=25^\circ C$, 200			Ω
Secondary coil resistance (R_s)	@ $T_a=25^\circ C$, 110			Ω

Polarity: output current I_S is positive when input current I_P is applied on the "+" terminal



Case Style and Connection



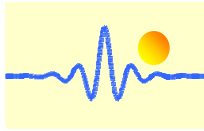
Application Note

1) Determination of Primary Resistor R_i

The primary resistor R_i should be selected to enable the rated input current to be equal to 10mA in order to obtain an optimal measuring accuracy.

For instance, the resistor R_i is 25k Ω for a rated input voltage of 250V. Here is recommended resistor in dependence of the measuring voltage:

Rated input voltage (V)	Resistor R_i (k Ω)
10	1
50	5
100	10
200	20
300	30
400	40
500	50



2) Measuring accuracy

The measuring accuracy depends on the input current. For instance, for measuring voltage of 250V, the accuracy is as follows:

Accuracy = \pm 1.6% (Ta=+25°C)

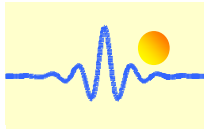
Accuracy = \pm 0.8% (Ta=+25°C)

Ri=50K Ω /5W, IP = 5mA

Ri=25K Ω /10W, IP =10mA

3) Measuring Range

The sensors are suitable for measuring a voltage 0 ~ \pm 500V. The primary resistor should be considered when selecting the measuring range in order to keep the temperature heating to a possible low level and to guarantee the high electric isolation property.

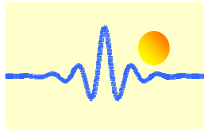


Hall Effect Voltage Sensor CYHVS10-20A

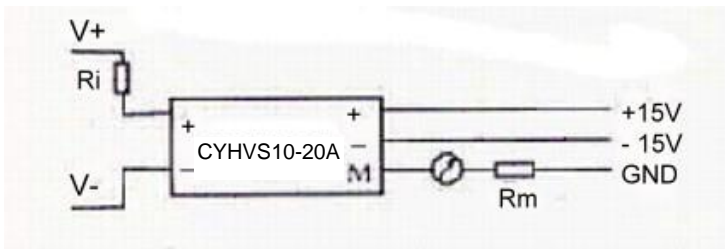
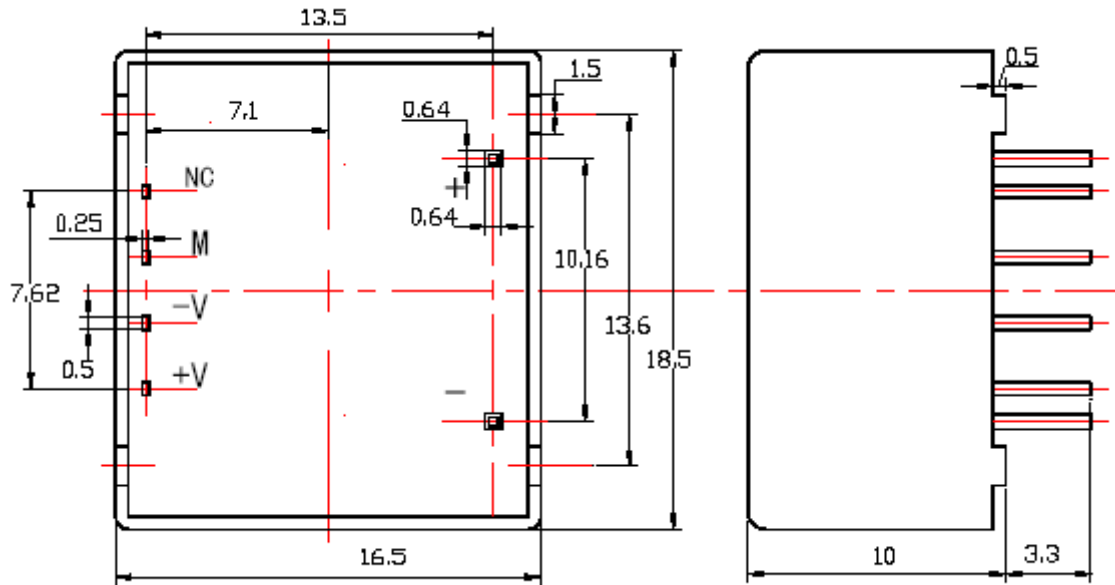
Electrical Parameters

Parameters	Values			Unit
Rated input current (I_n)	± 10			mA
Measuring range (I_P)	0 ~ ± 20			mA
Rated measuring voltage	1000			V
Max. measuring voltage	2000			V
Measuring resistance (R_M)		R_{Mmin}	R_{Mmax}	
	@ ± 10 mA	150	500	Ω
Rated secondary current (I_S)	± 20 ($\pm 0.5\%$)			mA
Power supply (V_C)	± 15 ($\pm 5\%$)			V
Turns ratio (N)	2000 : 1000			
Current consumption (I_C)	15 + I_S			mA
Isolation voltage (V_d)	2.5kV/50Hz/1min			
Measuring accuracy (X_G)	$\pm 0.8\%$ FS (see application note)			
Linearity (ϵ_L)	<0.2% FS			
Offset current (I_o)	± 0.15			mA
Thermal drift of offset current I_o (-40°C ~ +85°C)	± 0.6			mA
Response time (t_r)	<40			μs
Ambient operating temperature (T_A)	- 40°C ~ +85°C			
Ambient storage temperature (T_S)	-40°C ~ +125°C			
Primary coil resistance (R_p)	@ $T_a=25^\circ C$, 200			Ω
Secondary coil resistance (R_s)	@ $T_a=25^\circ C$, 100			Ω

Polarity: output current I_S is positive when input current I_P is applied on the "+" terminal



Case Style and Connection



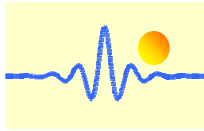
Application Note

1) Determination of Primary Resistor R_i

The primary resistor R_i should be selected to enable the rated input current to be equal to 10mA in order to obtain an optimal measuring accuracy.

For instance, the resistor R_i is 50k Ω for a rated input voltage of 500V. Here is recommended resistor in dependence of the measuring voltage:

Rated input voltage (V)	Resistor R_i (k Ω)
100	10
200	20
500	50
600	60
700	70
800	80
900	90
1000	100



2) Measuring accuracy

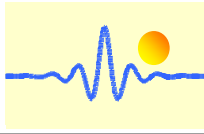
The measuring accuracy depends on the input current. For instance, for measuring voltage of 250V, the accuracy is as follows:

Accuracy =±1.0% (Ta=+25°C)
Accuracy =±0.5% (Ta=+25°C)

Ri=50KΩ/5W, IP = 5mA
Ri=25KΩ/10W, IP =10mA

3) Measuring Range

The sensors are suitable for measuring a voltage 0 ~ ±1000V. The primary resistor should be considered when selecting the measuring range in order to keep the temperature heating to a possible low level and to guarantee the high electric isolation property.

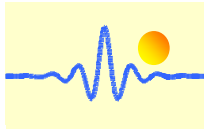


Hall Effect Voltage Sensor CYHVS5-25A

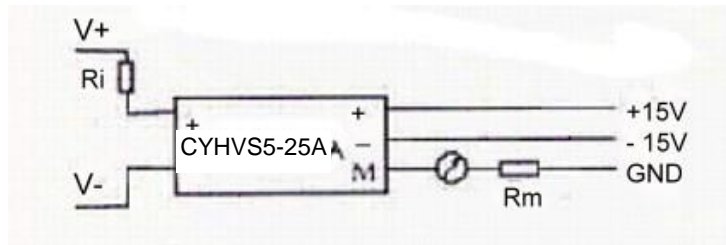
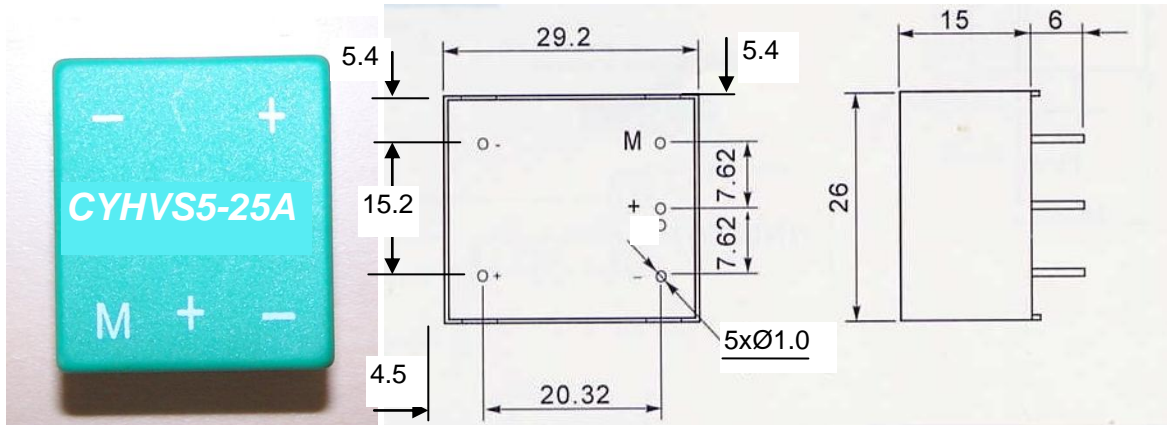
Electrical Parameters

Parameters	Values			Unit
Rated input current (I_N)	± 5			mA
Measuring range (I_P)	0~ ± 7			mA
Rated measuring voltage	1500			V
Max. measuring voltage	2000			V
Measuring resistance (R_M)		R_{Mmin}	R_{Mmax}	
	@ ± 5 mA	100	350	Ω
	@ ± 7 mA	100	190	Ω
Rated secondary current (I_S)	± 25 ($\pm 0.5\%$)			mA
Power supply (V_C)	± 15 ($\pm 5\%$)			V
Turns ratio (N)	5000 : 1000			
Current consumption (I_C)	15+ I_S			mA
Isolation voltage (V_d)	2.5kV/50Hz/1min			
Measuring accuracy (X_G)	$\pm 0.8\%$ FS (see application note)			
Linearity (ε_L)	<0.2% FS			
Offset current (I_o)	± 0.1			mA
Thermal drift of offset current I_o (-40°C~+85°C)	± 0.5			mA
Response time (t_r)	<40			μs
Ambient operating temperature (T_A)	- 40°C ~ +85°C			
Ambient storage temperature (T_S)	-40°C ~ +125°C			
Primary coil resistance (R_p)	@ $T_a=25^\circ C$, 650			Ω
Secondary coil resistance (R_s)	@ $T_a=25^\circ C$, 110			Ω

Polarity: output current I_S is positive when input current I_P is applied on the “+” terminal



Case Style and Connection



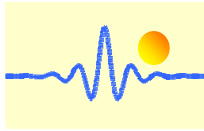
Application Note

1) Determination of Primary Resistor R_i

The primary resistor R_i should be selected to enable the rated input current to be equal to 5mA in order to obtain an optimal measuring accuracy.

For instance, the resistor R_i is 100k Ω for a rated input voltage of 500V. Here is recommended resistor in dependence of the measuring voltage:

Rated input voltage (V)	Resistor R_i (k Ω)
100	20
500	100
600	120
700	140
800	160
900	180
1000	200
1500	300



2) Measuring accuracy

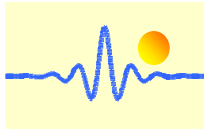
The measuring accuracy depends on the input current. For instance, for measuring voltage of 250V, the accuracy is as follows:

Accuracy =±1.6% (Ta=+25°C)
Accuracy =±0.8% (Ta=+25°C)

Ri=100KΩ/5W, IP =2.5mA
Ri=50KΩ/5W, IP =5mA

3) Measuring Range

The sensors are suitable for measuring a voltage 0 ~ ±1500V. The primary resistor should be considered when selecting the measuring range in order to keep the temperature heating to a possible low level and to guarantee the high electric isolation property.

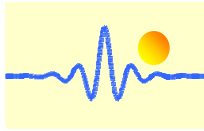


Hall Effect Voltage Sensor CYHVS025T

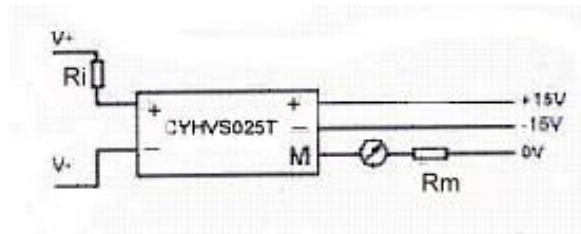
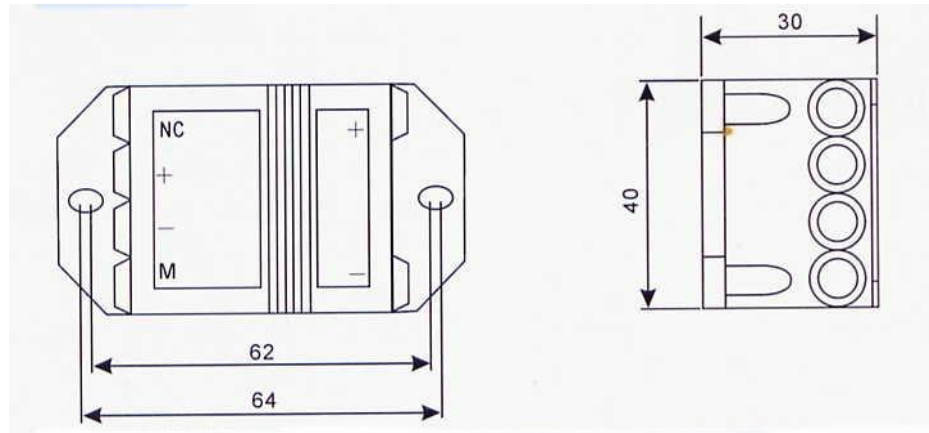
Electrical Parameters

Parameters	Values		Unit
Rated input current (I_N)	± 10		mA
Measuring range (I_P)	0 ~ ± 14		mA
Measuring voltage range	100-2500		V
Measuring resistance (R_M)		R_{Mmin}	R_{Mmax}
	@ ± 10 mA	100	300
Rated secondary current (I_S)	± 25		mA
Power supply (V_C)	± 15 ($\pm 5\%$)		V
Turns ratio (N)	2500 : 1000		
Current consumption (I_C)	10+ I_S		mA
Isolation voltage (V_d)	2.5kV/50Hz/1min		
Measuring accuracy (X_G)	$\pm 0.6\%$ FS (Full Scale)		
Linearity (ϵ_L)	<0.2% FS		
Offset current (I_o)	typical	maximum	
	± 0.1	± 0.15	mA
Thermal drift of offset current I_o	0°C~70°C	± 0.2	mA
	-40°C~+85°C	± 0.3	mA
Response time (t_r)	<40		μ s
Ambient operating temperature (T_A)	-10°C ~ +70°C		
Ambient storage temperature (T_S)	- 40°C ~ +85°C		
Primary resistance (R_i)	@ $T_a=25^\circ\text{C}$,	140	Ω
Secondary coil resistance (R_s)	@ $T_a=25^\circ\text{C}$,	40	Ω

Polarity: output current I_S is positive when input current I_P is applied on the "+" terminal



Case Style and Connection



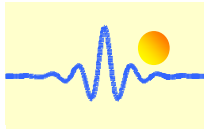
Application Note

1) Determination of Primary Resistor R_i

The primary resistor R_i should be selected to enable the rated input current to be equal 10mA in order to obtain an optimal measuring accuracy.

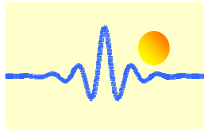
For instance, the resistor R_i is 25k Ω for a rated input voltage of 250V. Here is recommended resistor in dependence of the measuring voltage:

Rated Input voltage (V)	Resistor R_i (k Ω)
100	10
200	20
500	50
1000	100
1500	150
2000	200
2500	250



2) Measuring Range

The sensors are suitable for measuring a voltage $\pm 100 \sim \pm 2500\text{V}$. The primary resistor should be considered when selecting the measuring range in order to keep the temperature heating to a possible low level and to guarantee the high electric isolation property.



Hall Effect Voltage Sensor CYHVS100C

CYHVS100C is a new Hall Effect voltage sensor, which is based on Hall Effect closed loop and magnetic compensation principle. This sensor can be used for measuring and monitoring DC and AC voltages.

Features

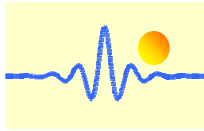
- High electrical isolation
- High reliability
- Good overload capability
- Small sizes
- Insulated plastic case recognized according to UL94-V0

Applications

- Switched Mode Power Supplies
- Uninterruptible power supplies (UPS)
- Overvoltage protection
- Feedback of control systems
- Electric power network monitoring
- AC frequency conversion servo-motors
- Various power supplies

Electrical Parameters

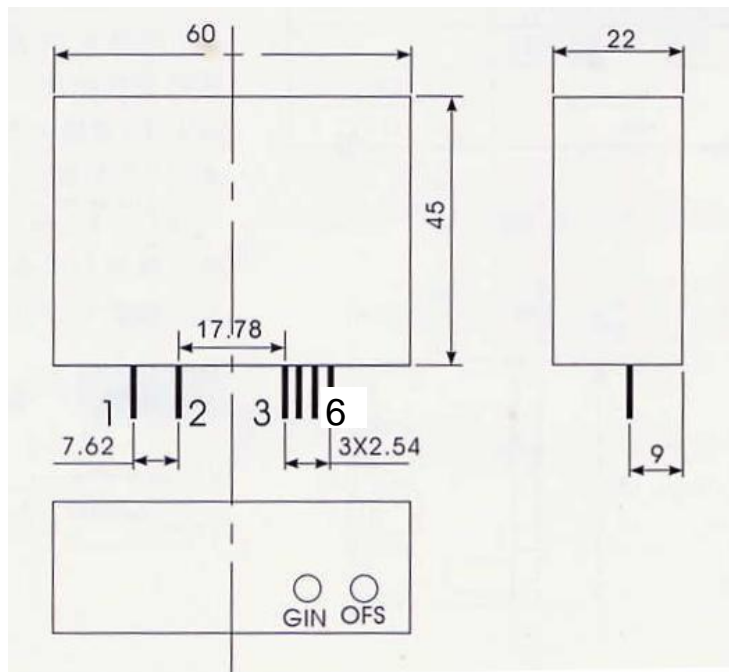
Parameters	Typical	Maximum	
Rated input voltage (V_N)	100V DC		
Measuring voltage range (V_{in})	0~200V DC		
Maximum measuring error (ϵ_M)	$\pm 0.5\%$ FS		
Power supply (V_c)	$\pm 12V \sim \pm 15V$ ($\pm 5\%$)		
Rated output voltage (V_o)	5 V DC		
Turns ratio (N)	4000 : 1000		
Isolation voltage (V_d)	2.5kV/50Hz/1min		
Linearity (ϵ_L)	$\pm 0.2\%$ FS	$\pm 0.4\%$ FS	
Offset voltage (V_{os})	$\pm 10mV$	$\pm 20mV$	
Thermal drift of offset voltage V_{os}	$0^\circ C \sim 70^\circ C$ $-40^\circ C \sim +85^\circ C$	$\pm 0.5mV/^\circ C$ $\pm 1.0mV/^\circ C$	$\pm 1.0mV/^\circ C$ $\pm 2.0mV/^\circ C$
Frequency band width (f_b)	DC~ 10kHz (-3dB)		
Ambient Operating Temperature (T_A)	$-10^\circ C \sim +70^\circ C$		
Ambient Storage Temperature (T_S)	$-25^\circ C \sim +85^\circ C$		
Input resistance (R_i)	@ $T_a=25^\circ C$, 21k Ω		



Case Style and Connection

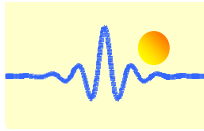


- | | |
|-------------------|-------------------|
| 1. Input + | 2. Input – |
| 3. Power supply + | 4. Power supply – |
| 5. GND | 6. Output |



Application Note

- 1) The sensor is connected according to the figure shown above. The output voltage can be detected at the output terminal when the measuring voltage is applied on the input terminal of the sensor. (Note: the sensor can be damaged by a incorrect connection)
- 2) Measuring voltage range of this sensor is 100V~200V.
- 3) OFS: adjustment of DC zero point;
GIN: adjustment of the gain (amplitude of the output voltage)



Hall Effect Voltage Sensor CYHVS500T

CYHVS500T is a Hall Effect Voltage sensor, which is based on Hall Effect and magnetic compensation principle. This sensor can be used for measuring DC and AC voltage with different wave forms. It has high electric isolation.

Features

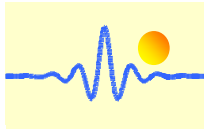
- High electrical isolation
- High reliability
- Good overload capability
- Small sizes
- Insulated plastic case recognized according to UL94-V0

Applications

- Switched Mode Power Supplies
- Uninterruptible power supplies (UPS)
- Overvoltage protection
- Feedback of control systems
- Electric power network monitoring
- AC frequency conversion servo-motors
- Various power supplies

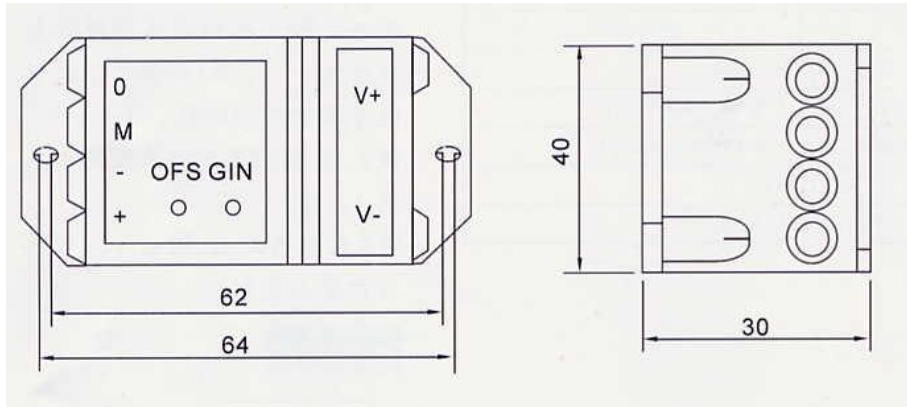
Electrical Parameters

Parameters	Part number				
	CYHVS100T	CYHVS200T	CYHVS300T	CYHVS400T	CYHVS500T
Rated input voltage (V_N)	100V	200V	300V	400V	500V
Linear measuring range (V_{in})	0~150V	0~300V	0~450V	0~600V	0~750V
Rated output voltage V_{oN}	4V or 5V				
Power supply (V_c)	$\pm 12V \sim \pm 15V (\pm 5\%)$				
Offset voltage (V_{os})	$\leq \pm 40mV$				
Thermal drift of V_{os}	$\leq \pm 1mV/^\circ C$				
Linearity (ϵ_L)	$\leq \pm 1.0\% FS$				
Response time (t_r)	$\leq 40\mu s$				
Isolation voltage (V_d)	2.5kV/50Hz/1min				
Frequency band width (f_b)	DC~ 10kHz (-3dB)				
Current consumption (I_c)	< 25mA				
Measuring accuracy (X_G)	< $\pm 1.0\% FS$ (Full Scale)				
Ambient Operating Temperature (T_A)	$-10^\circ C \sim +70^\circ C$				
Ambient Storage Temperature (T_S)	$-25^\circ C \sim +85^\circ C$				



Case Style and Connection

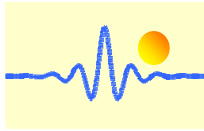
CYHVS500T



“V+” Input + “V-“ Input –
“+” Power supply + “-“ Power supply –
“O” GND “M” Output

Application Note

- 1) The sensor is connected according to the figure shown above. The output voltage can be detected at the output terminal M when the measuring voltage is applied on the input terminal of the sensor. (Note: the sensor can be damaged by a incorrect connection)
- 2) OFS: adjustment of DC zero point;
GIN: adjustment of the gain (amplitude of the output voltage)



AC/DC Hall Effect Voltage Sensors CYHVS800D and CYHVS800DA

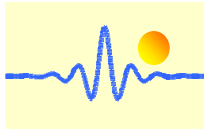
CYHVS800D and CYHVS800DA are Hall Effect Voltage sensors, which are based on Hall Effect closed loop and magnetic compensation principle. These sensors can be used for measuring AC and DC voltage with different wave forms. They have high electric isolation.

Features

- High electrical isolation
- High reliability
- Good overload capability
- Small sizes
- Insulated plastic case recognized according to UL94-V0

Applications

- Switched Mode Power Supplies
- Uninterruptible power supplies (UPS)
- Overvoltage protection
- Feedback of control systems
- Electric power network monitoring
- AC frequency conversion servo-motors
- Various power supplies



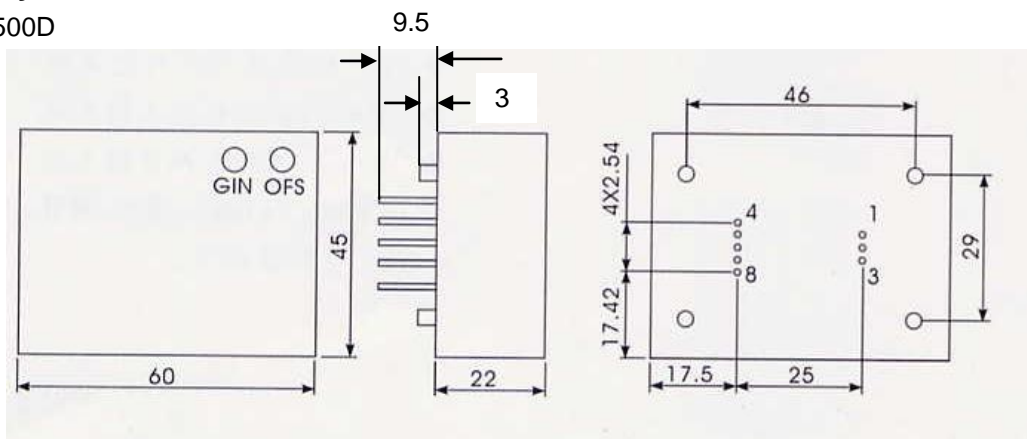
AC/DC Hall Effect Voltage Sensor CYHVS800D

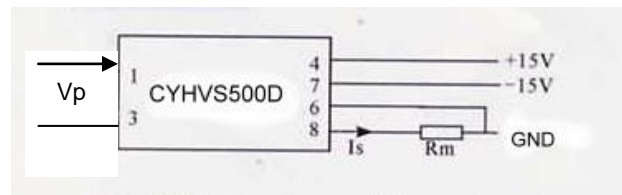
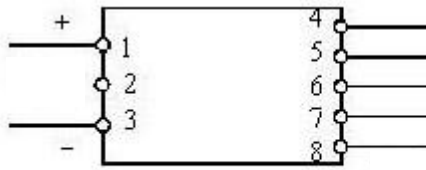
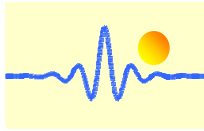
Electrical Parameters

Parameter	Part Number				
	CYHVS50D	CYHVS200D	CYHVS400D	CYHVS500D	CYHVS800D
Rated input voltage (V_N)	$\pm 50V$	$\pm 200V$	$\pm 400V$	$\pm 500V$	$\pm 800V$
Measuring voltage range (V_{in})	$0 \sim \pm 100V$	$0 \sim \pm 400V$	$0 \sim \pm 800V$	$0 \sim \pm 1000V$	$0 \sim \pm 1000V$
Rated output current (I_s)	20mA				
Turns ratio (N)	4000 : 1000				
Measuring Resistance (R_m)	$V_c = \pm 15VDC,$		54~360 Ω		
Power supply (V_c)	$\pm 12V \sim \pm 15V DC$				
Isolation voltage (V_d)	2.5kV/50Hz/1min				
Linearity (ϵ_L)	$\pm 0.2\% FS$				
Maximum measuring error (ϵ_M)	$T_a = 25^\circ C, V_c = \pm 15VDC$		$\pm 0.8\% FS$		
Offset current (I_o)	$T_a = 25^\circ C,$		$\pm 0.2mA$		
Thermal drift of offset current	$V_p = 0, T_a = -25^\circ C \sim +85^\circ C$		$\pm 0.5mA$		
Response time	100 μs				
Frequency band width (f_b)	DC~ 5kHz (-3dB)				
Ambient Operating Temperature (T_A)	$40^\circ C \sim +85^\circ C$				
Ambient Storage Temperature (T_S)	$-55^\circ C \sim +125^\circ C$				
Input resistance (R_i)	$T_a = 25^\circ C,$		400k Ω		
Secondary coil resistance (R_s)	$T_a = 25^\circ C,$		50 Ω		

Case Style and Connection

CYHVS500D

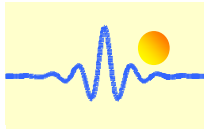




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|-------------------|-------------------|
| 1. Input + | 2. NC |
| 3. Input - | 4. Power supply + |
| 5. NC | 6. GND |
| 7. Power supply - | 8. Output |

Application Note

- 1) The sensor is connected according to the figure shown above. The output voltage can be detected at the output terminal when the measuring voltage is applied on the input terminal of the sensor. (Note: the sensor can be damaged by a incorrect connection)
- 2) Maximum measuring voltage range of this sensor is 1.5 times of the rated input voltage.
- 3) OFS: adjustment of DC zero point;
GIN: adjustment of the gain (amplitude of the output voltage)



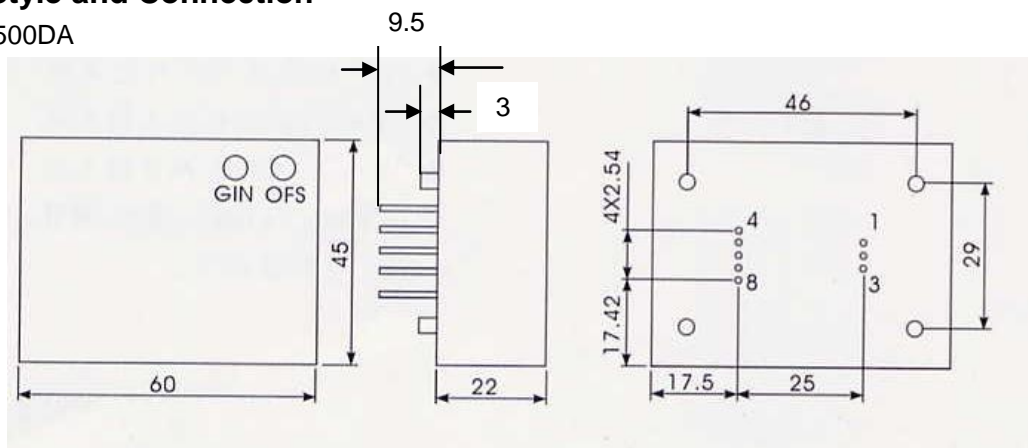
AC Hall Effect Voltage Sensor CYHVS800DA

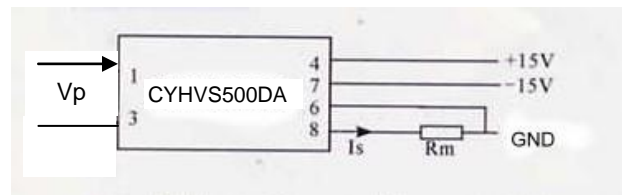
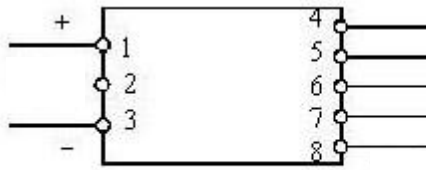
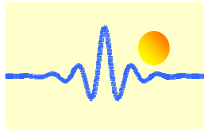
Electrical Parameters

Parameter	Part number				
	CYHVS500DA	CYHVS2000DA	CYHVS4000DA	CYHVS5000DA	CYHVS8000DA
Rated input voltage (V_N)	50V AC	200V AC	400V AC	500V AC	800V AC
Measuring voltage range (V_{in})	100V AC	400V AC	800V AC	1000V AC	1000V AC
Rated output current (I_s)	0-20mADC				
Turns ratio (N)	4000 : 1000				
Measuring Resistance (R_m)	$V_c = \pm 15VDC$,		54-360 Ω		
Power supply (V_c)	$\pm 12V \sim \pm 15V DC$				
Isolation voltage (Vd)	2.5kV/50Hz/1min				
Linearity (ϵ_L)	$\pm 0.2\% FS$				
Maximum measuring error (ϵ_M)	$T_a=25^\circ C$, $V_c=\pm 15VDC$		$\pm 0.8\% FS$		
Offset current (I_o)	$T_a=25^\circ C$,		$\pm 0.2mA$		
Thermal drift of offset current	$V_p=0$, $T_a=-25^\circ C \sim +85^\circ C$		$\pm 0.5mA$		
Response time	100ms				
Frequency band width (f_b)	20Hz ~ 5kHz (-3dB)				
Ambient Operating Temperature (T_A)	40 $^\circ C \sim +85^\circ C$				
Ambient Storage Temperature (T_S)	-55 $^\circ C \sim +125^\circ C$				
Input resistance (R_i)	$T_a=25^\circ C$,		400k Ω		
Secondary coil resistance (R_s)	$T_a=25^\circ C$,		50 Ω		

Case Style and Connection

CYHVS500DA





- | | |
|-------------------|-------------------|
| 1. Input + | 2. NC |
| 3. Input - | 4. Power supply + |
| 5. NC | 6. GND |
| 7. Power supply - | 8. Output |

Application Note

- 1) The sensor is connected according to the figure shown above. The output voltage can be detected at the output terminal when the measuring voltage is applied on the input terminal of the sensor. (Note: the sensor can be damaged by a incorrect connection)
- 2) Maximum measuring voltage range of this sensor is 1.5 times of the rated input voltage.
- 3) OFS: adjustment of DC zero point;
GIN: adjustment of the gain (amplitude of the output voltage)