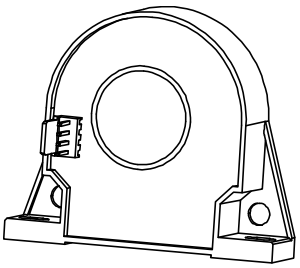
CR1A H00 SERIES

Current Sensor

Model Number

CR1A 50 H00
CR1A 100 H00
CR1A 200 H00
CR1A 300 H00



For the electronic measurement of current: DC, AC, pulsed…, with galvanic separation between the primary and the secondary circuits.

Features

- Closed loop（compensated） current sensor using the Hall Effect
- Galvanic separation between primary and secondary
- Insulating plastic case recognized according to UL 94-V0
- Very good linearity
- High accuracy
- Very low offset drift over temperature
- No insertion loss
- Standards:
  - IEC 60664-1:2020
  - IEC 61800-5-1:2022
  - IEC 62109-1:2010

Applications

- AC variable speed and servo motor drives
- Uninterruptible Power Supplies (UPS)
- Static converters for DC motor drives
- Switch Mode Power Supplies (SMPS)
- Power supplies for welding applications
- Battery management
- Wind energy inverter
- Test and detection devices

Safety

This sensor must be used according to IEC61800-5-1.
This sensor must be used in electric/electronic equipment with respect to applicable standards and safety requirements in accordance with the following manufacture's operating instructions.

Caution, risk of electrical shock!

When operating the sensor, certain parts of the module can carry hazardous voltage (e.g., Primary busbar, power supply). Ignore this warning can lead to injury and/or cause serious damage.
This sensor is a built-in device, whose conducting parts must be inaccessible after installation. A protective housing or additional shield could be used.
Main supply must be able to be disconnected.

Absolute maximum ratings（not operating）

Parameter	Symbol	Unit	Value
Supply voltage	V_C	V	±18
Primary conductor temperature	T_B	℃	100

※ Stress above these ratings may cause permanent damage.

※ Exposure to absolute maximum ratings for extended periods may degrade reliability.

Environmental and mechanical characteristics

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Ambient operating temperature	T_A	℃	-40		85	
Ambient storage temperature	T_S	℃	-40		90	
Mass	m	g		80		

Insulation coordination

Parameter	Symbol	Unit	Value	Comment
Rms voltage for AC insulation test @50 Hz, 1 min	V_d	kV	4.2	According to IEC 60664-1
Comparative tracking index	*CTI*	PLC	3	
Application example	-	-	300V	Reinforced insulation，according to IEC 61800-5-1, IEC 62109-1CAT Ⅲ, PD2
Application example	-	-	600V	Basic insulation，a ccording to IEC 61800-5-1, IEC 62109-1CAT Ⅲ, PD2

Electrical data

CR1A 50 H00

※ With T_A = 25℃, V_C = ±15V, R_L = 50Ω, unless otherise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	I_{PN}	A	-50		50	
Primary current, measuring range	I_{PM}	A	-70		70	
Measuring resistance	R_M	Ω	0 0 0 0		140 70 200 110	@±12V,±50A @±12V,±70A @±15V,±50A @±15V, ±70A
Secondary nominal rms current	I_{SN}	mA	-50		50	
Secondary coil resistance	R_S	Ω			11	@ 70℃
Secondary current	I_S	mA	-100		100	
Number of secondary turns	N_S	-		1000		
Theoretical sensitivity	G_{th}	mA/A		1		
Supply voltage	V_C	V	±12		±15	@ ±5%
Current consumption	I_C	mA		20+I_S		
Zero offset current	I_O	mA	-0.2		0.2	
Thermal drift of offset current	I_{OT}	mA	-0.5	±0.2	0.5	@ -40℃~85℃
Residual current @ I_P=0 after 3 ×I_{PN}	I_{OM}	mA	-0.1		0.1	
Sensitivity error	ε_G	%	-0.2		0.2	Exclusive of I_{OE}
Linearity error 0…I_{PN}	ε_L	% of I_{PN}	-0.1		0.1	Exclusive of I_{OE}
Accuracy @ I_{PN}	X	% of I_{PN}	-0.5		0.5	Exclusive of I_{OE}
Response time @ 90% of I_{PN}	t_r	μs		0.5	1	
Frequency bandwidth (-3dB)	BW	kHz		200		

Electrical data

CR1A 100 H00

※ With T_A = 25℃, V_C = ±15V, R_L = 50Ω, unless otherise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	I_{PN}	A	-100		100	
Primary current, measuring range	I_{PM}	A	-200		200	
Measuring resistance	R_M	Ω	0 0 0 0		181 72 238 100	@±12V, 85℃, ±100A @±12V, 85℃, ±200A @±15V, 85℃, ±100A @±15V, 85℃, ±200A
Secondary nominal rms current	I_{SN}	mA	-50		50	
Secondary coil resistance	R_S	Ω			35 46	@ 25℃ @ 85℃
Secondary current	I_S	mA	-100		100	
Number of secondary turns	N_S	-		2000		
Theoretical sensitivity	G_{th}	mA/A		0.5		
Supply voltage	V_C	V	±12		±15	@ ±5%
Current consumption	I_C	mA		20+I_S		
Zero offset current	I_O	mA	-0.2		0.2	
Thermal drift of offset current	I_{OT}	mA	-0.5	±0.2	0.5	@ -40℃~85℃
Residual current @ I_P=0 after 3 ×I_{PN}	I_{OM}	mA	-0.1		0.1	
Sensitivity error	ε_G	%	-0.2		0.2	Exclusive of I_{OE}
Linearity error 0…I_{PN}	ε_L	% of I_{PN}	-0.1		0.1	Exclusive of I_{OE}
Accuracy @ I_{PN}	X	% of I_{PN}	-0.5		0.5	Exclusive of I_{OE}
Response time @ 90% of I_{PN}	t_r	μs		0.5	1	
Frequency bandwidth (-3dB)	BW	kHz		200		

CR1A H00 SERIES

Electrical data

CR1A 200 H00

※ With T_A = 25℃, V_C = ±15V, R_L = 5Ω, unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	I_{PN}	A	-200		200	
Primary current, measuring range	I_{PM}	A	-400		400	
Measuring resistance	R_M	Ω	0 0 0 0		60 5 88 19	@±12V, 85℃, ±200A @±12V, 85℃, ±400A @±15V, 85℃, ±200A @±15V, 85℃, ±400A
Secondary nominal rms current	I_{SN}	mA	-100		100	
Secondary coil resistance	R_S	Ω			35 46	@ 25℃ @ 85℃
Secondary current	I_S	mA	-200		200	
Number of secondary turns	N_S	-		2000		
Theoretical sensitivity	G_{th}	mA/A		0.5		
Supply voltage	V_C	V	±12		±15	@ ±5%
Current consumption	I_C	mA		20+I_S		
Zero offset current	I_O	mA	-0.2		0.2	
Thermal drift of offset current	I_{OT}	mA	-0.5	±0.2	0.5	@ -40℃~85℃
Residual current@I_P=0 after 3×I_{PN}	I_{OM}	mA	-0.1		0.1	
Sensitivity error	ε_G	%	-0.2		0.2	Exclusive of I_{OE}
Linearity error 0…I_{PN}	ε_L	% of I_{PN}	-0.1		0.1	Exclusive of I_{OE}
Accuracy @ I_{PN}	X	% of I_{PN}	-0.5		0.5	Exclusive of I_{OE}
Response time @ 90% of I_{PN}	t_r	μs		0.5	1	
Frequency bandwidth (-3dB)	BW	kHz		200		

Electrical data

CR1A 300 H00

※ With T_A = 25℃, V_C = ±15V, R_L = 3Ω, unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	I_{PN}	A	-300		300	
Primary current, measuring range	I_{PM}	A	-500		500	
Measuring resistance	R_M	Ω	0 0 0 0		30 3 48 12	@±12V, 85℃, ±300A @±12V, 85℃, ±500A @±15V, 85℃, ±300A @±15V, 85℃, ±500A
Secondary nominal rms current	I_{SN}	mA	-150		150	
Secondary coil resistance	R_S	Ω			35 46	@ 25℃ @ 85℃
Secondary current	I_S	mA	-250		250	
Number of secondary turns	N_S	-		2000		
Theoretical sensitivity	G_{th}	mA/A		0.5		
Supply voltage	V_C	V	±12		±15	@ ±5%
Current consumption	I_C	mA		20+I_S		
Zero offset current	I_O	mA	-0.2		0.2	
Thermal drift of offset current	I_{OT}	mA	-0.5	±0.2	0.5	@ -40℃~85℃
Residual current @I_P=0 after 3×I_{PN}	I_{OM}	mA	-0.1		0.1	
Sensitivity error	ε_G	%	-0.2		0.2	Exclusive of I_{OE}
Linearity error 0…I_{PN}	ε_L	% of I_{PN}	-0.1		0.1	Exclusive of I_{OE}
Accuracy @ I_{PN}	X	% of I_{PN}	-0.5		0.5	Exclusive of I_{OE}
Response time @ 90% of I_{PN}	t_r	μs		0.5	1	
Frequency bandwidth (-3dB)	BW	kHz		200		

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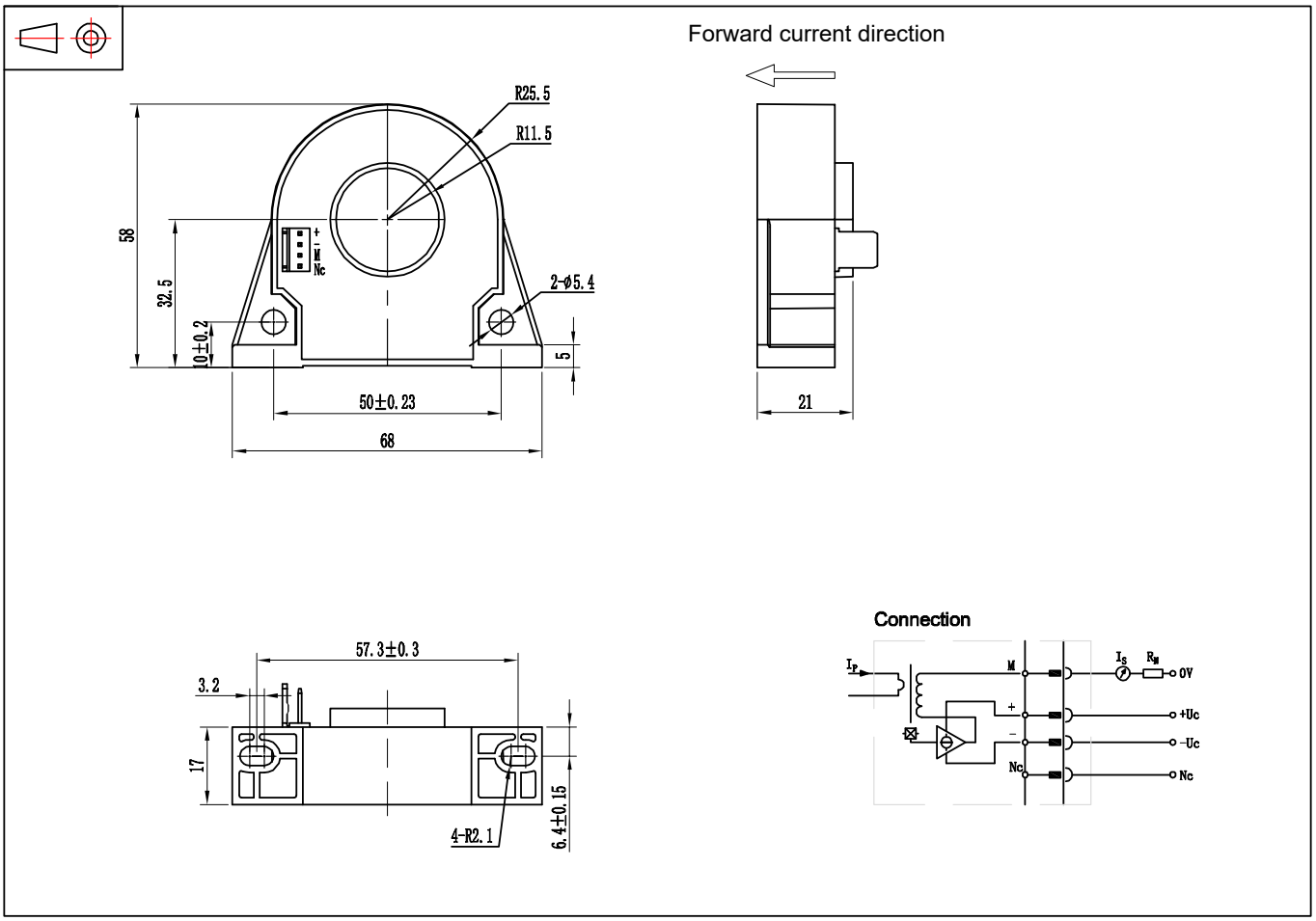
Dimensions（in mm. 1 mm = 0.0394 inch）



Mechanical characteristics

- ✧ General tolerance ±0.3 mm
- ✧ Primary hole Φ23.0mm

Transduce vertical fastening 2pc Φ4.5 mm through-hole
2pc M4 metal screws

Recommended fastening torque
0.9 N•m (±10%)

- ✧ Connection of secondary MOLEX 5045-04A
- ✧ Transduce horizontal fastening 4pc Φ5.4 mm through-hole
4pc M5 metal screws

Recommended fastening torque
0.9 N•m (±10%)

Remarks

- ✧ I_S and I_P are in the same direction, when I_P flows in the direction of arrow.
- ✧ Temperature of the primary conductor should not exceed 100℃.
- ✧ Dynamic performances (di/dt and response time)are best with a single bar completely filling the primary hole.

This is a standard model. For different applications (measurement, secondary connections…), please contact CHIPSENSE.