SensorsX

SX-ECMNA-1000ALFA Series

Closed-Loop Hall-Effect Current Sensor — 1,000 A

High-Current Measurement — Through-Hole Design



1,000 A Primary Nominal Current	**±0.1% F.S.** Linearity	**6 kV** Insulation Voltage (AC / 50 Hz / 1 min)
200 mA Secondary Nominal Output	**DC – 200 kHz** Frequency Bandwidth (−3 dB)	**±15 – ±24 V** Supply Voltage (±5%)

■ PRODUCT OVERVIEW

The SX-ECMNA-1000ALFA is a closed-loop Hall-effect current sensor for measuring AC, DC, pulsed and mixed currents with galvanic isolation between the primary and secondary circuits. It features a through-hole design for the primary conductor and delivers a nominal secondary output current of 200 mA at a nominal primary current of 1,000 A.The sensor operates from a dual ±15 V to ±24 V supply and provides a frequency bandwidth from DC to 200 kHz (−3 dB). For optimal dynamic performance, the primary conductor should be positioned at the center of the aperture.



■ KEY FEATURES

◆ Linearity of ±0.1% F.S.	◆ Frequency bandwidth of DC–200 kHz (–3 dB)
◆ Response time of ≤1 μs with di/dt tracking >100 A/μs	◆ 6 kV AC insulation withstand voltage (50 Hz, 1 min)

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■ TYPICAL APPLICATIONS

- High-current AC/DC busbar measurement
- Battery management and charging systems
- Inverters, converters and motor drives
- Welding and industrial power equipment
- Switch-mode and UPS power supplies

■ PERFORMANCE SPECIFICATIONS

Primary Current	
Primary Nominal Input Current (I_{PN})	1,000 A
Measuring Range of Primary Current (I_P)	−2,800 to +2,800 A (V_C = ±24 V, R_M = 2 Ω)
Conversion Ratio (K_N)	1:5,000
Accuracy	
Linearity (ε_L)	±0.1% F.S. @ I_P = 0 – ±I_{PN}
Zero Offset Current (I_0)	< ±0.2 mA @ T_A = 25 °C (77 °F)
Thermal Drift of I_0 (I_{OT})	< ±0.5 mA @ I_{PN} = 0, T_A = −40 to +85 °C (−40 to +185 °F)
Dynamic	
Response Time (T_R)	≤ 1 µs @ 100 A/µs, 10%–90%
Frequency Bandwidth (f)	DC–200 kHz @ −3 dB
Accurately Tracked Current Rate of Change (di/dt)	> 100 A/µs

■ ELECTRICAL SPECIFICATIONS

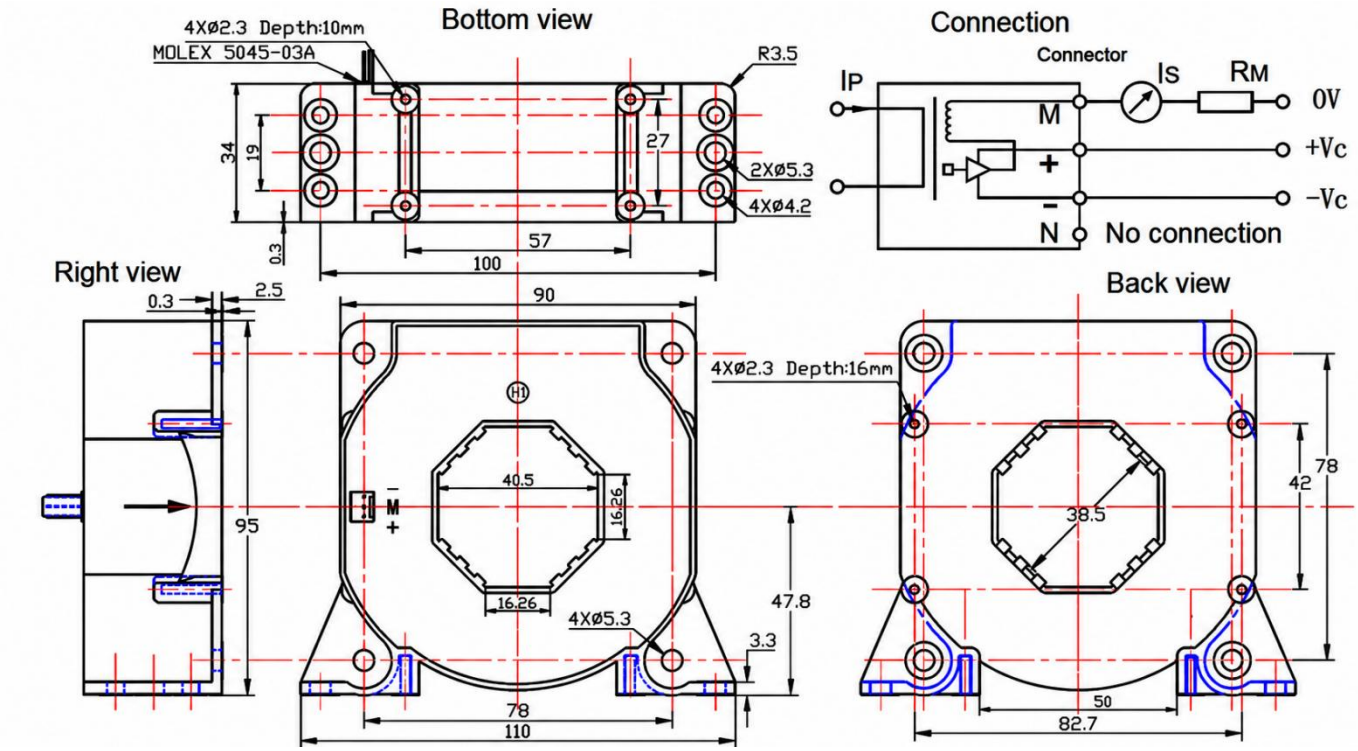
Power	
Supply Voltage (V_C)	±15–±24 V (±5%)
Current Consumption (I_C)	20 mA + I_P / K_N
Output Signal	
Secondary Nominal Output Current (I_{OUT})	200 mA ± 0.3%
Measuring Resistance (R_M) @ ±15 V	0–35 Ω @ ±1,000 A max.; 0–4.5 Ω @ ±1,600 A max.
Measuring Resistance (R_M) @ ±24 V	0–80 Ω @ ±1,000 A max.; 0–2.0 Ω @ ±2,800 A max.
Secondary Coil Resistance (R_S)	36 Ω @ T_A = 25 °C (77 °F)
Isolation	
Insulation Voltage (V_D)	6 kV AC, 50 Hz, 1 min

■ ENVIRONMENTAL SPECIFICATIONS

Temperature	
Ambient Operating Temperature (T_A)	−40 to +85 °C (−40 to +185 °F)
Ambient Storage Temperature (T_S)	−40 to +125 °C (−40 to +257 °F)
Primary Conductor Temperature	≤ 120 °C (248 °F)
Weight	
Mass (m)	505 g (17.8 oz)

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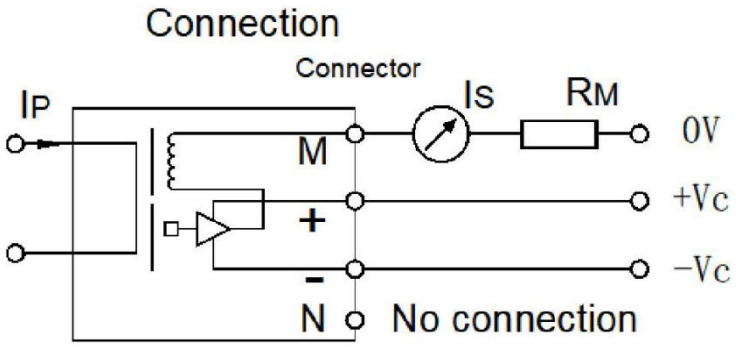
■ MECHANICAL DIMENSIONS



Note: All dimensions are in millimeters unless otherwise specified.

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■ WIRING DIAGRAM



Terminal Assignment

+	$+V_C$ (+15 … +24 V)
−	$-V_C$ (−15 … −24 V)
M	I_{OUT} (measuring output, via R_M to 0 V)
N	No connection

Remarks

- Incorrect wiring may damage the sensor.
- The secondary output current (I_{OUT}) is positive when the primary current (I_P) flows in the direction indicated by the arrow.
- For optimal dynamic performance (di/dt tracking and response time), position the primary conductor at the center of the aperture.
- The primary conductor temperature must not exceed 120 °C (248 °F).

■ ORDERING INFORMATION — SX-ECMNA

Complete model number example: SX-ECMNA-1000ALFA13200

Rated Primary Current	
1000A	1,000 A
Housing	
LFA	through-hole, 110 × 95 × 34 mm
Power Supply Type	
1	Dual (bipolar) supply
Supply Voltage	
3	±15–±24 V
Rated Output	
200	200 mA
Customization Option	
D	Custom configuration — specify requirements when ordering

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