PE210610 – Ampera Datasheet

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FEATURES

- ±50 mV Analog input voltage range
- 3-wire 4-20 mA analog output & Supply
- 1.600 V input to output reinforced insulation barrier
- ≥20 mm Creepage & Clearance distances
- Superior Gain and offset characteristics
- Fully potted housing, resistant against;
    - Shock, vibration
    - Moisture
    - Dust & debris
- Excellent common and differential noise rejection
- Diagnostic output feature
- Easy integration & installation

APPLICATION EXAMPLE

The Ampera is designed to directly interface with a ±50mV current measurement shunt resistor.

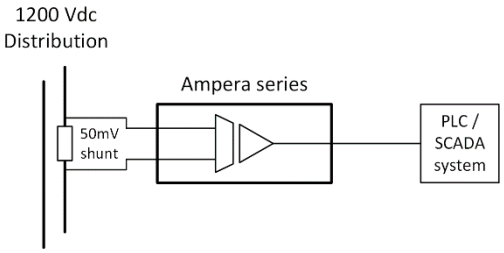
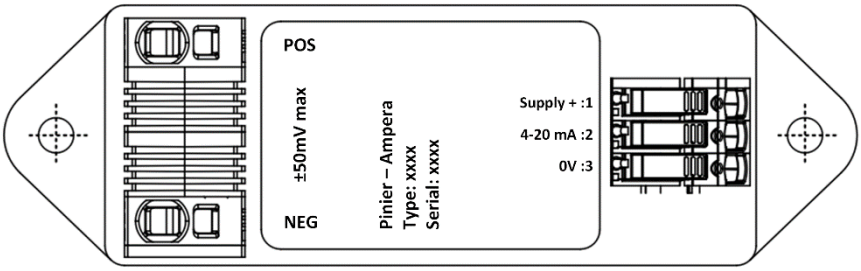


FIGURE 2, CURRENT SENSE APPLICATION

TERMINAL DESCRIPTION



Terminal	Description
POS	Positive analog input, connect to shunt resistor
NEG	Negative analog input, connect to shunt resistor
1	Positive Supply (11 – 28V)
2	4-20mA output
3	Negative Supply (0V)

DEVICE DESCRIPTION

The Ampera is a reinforced isolated signal amplifier designed specifically for interfacing low-voltage control systems with high-voltage DC distribution networks or battery systems. The isolator ensures accurate measurements while providing isolation between the high-voltage input and the low-voltage control equipment. The signal isolator is powered from a single 11 to 28V DC supply.

The analog input range is from -50mV to +50mV, which can originate from a current shunt resistor. The Ampera reflects the magnitude of the input voltage on the analog output with a bandwidth of 100 kHz. The full range of the analog input signal is translated to a (3-wire) 4-20mA analog output. As a diagnostic feature, the output is set to 2mA upon detection of a functional malfunction in the isolator circuitry.

SPECIFICATIONS

MAXIMUM RATINGS

Parameter	Condition	MAX	UNIT
Supply voltage		32	V
Analog input voltage	Ampera series	±2	V
Common mode voltage	Input to output CM voltage	±1.7	kV
Temperature		85	°C
Shock	Three orthogonal directions	30	G

RECOMMENDED OPERATING CONDITIONS

Parameter	Condition	MIN – MAX	UNIT
Power Supply	4-20mA	11 – 28	V
Analog Input	Ampera	-50 – 50	mV
Ambient temperature		-20 – 80	°C

INSULATION SPECFICIATIONS

Parameter	Condition	Value	UNIT
External Clearance	Between input terminals	≥ 20	mm
External Creepage	Between input terminals	≥ 28	mm
External Clearance	Input to output terminal	≥ 60	mm
External Creepage	Input to output terminal	≥ 70	mm
Maximum-rated isolation working voltage	VDE V 0884-11	1.7	kVpk
Maximum transient isolation voltage	t = 60 s (qualification test)	6	kV
Maximum transient isolation voltage	t = 5 s (100% production test)	7.2	kV
Insulation resistance	Input to output	≥ 10	GΩ
Barrier capacitance	Input to output	5	pF
Comparative tracking index	IEC 60112	≥ 600	V
Overvoltage category per IEC 60664-1	Rated mains voltage ≤ 600 VRMS	I-IV	
Overvoltage category per IEC 60664-1	Rated mains voltage ≤ 1000 VRMS	I-III	
Pollution degree		2	

ELECTRICAL SPECIFICATIONS

Parameter	Condition	Value	UNIT
INPUT			
Input voltage range	Linear operating range	±50	mV
Diff. input resistance	Ampera	4.9	kΩ
OUTPUT 4-20mA			
Nominal gain	Input to output, Volta	100	V/mA
Nominal gain	Input to output, Ampera	6.25	mV/mA
Offset		±5	µA
Gain error		±0.1	%
Output bandwidth	-3dB	200	kHz
Supply			
Current draw	At 12V supply	18	mA
	At 24V supply	12	mA

CONNECTIONS

Figure 3 presents a connection example of the three-wire 4-20mA interface of the signal isolator.

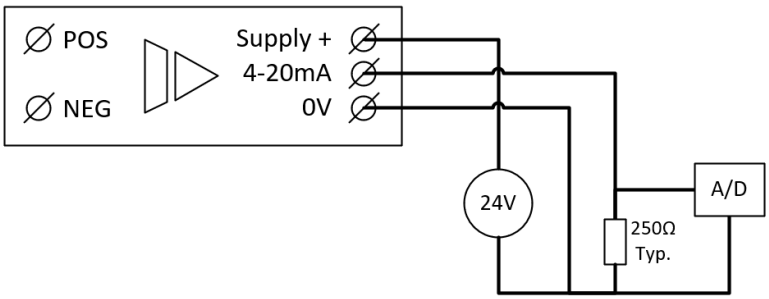
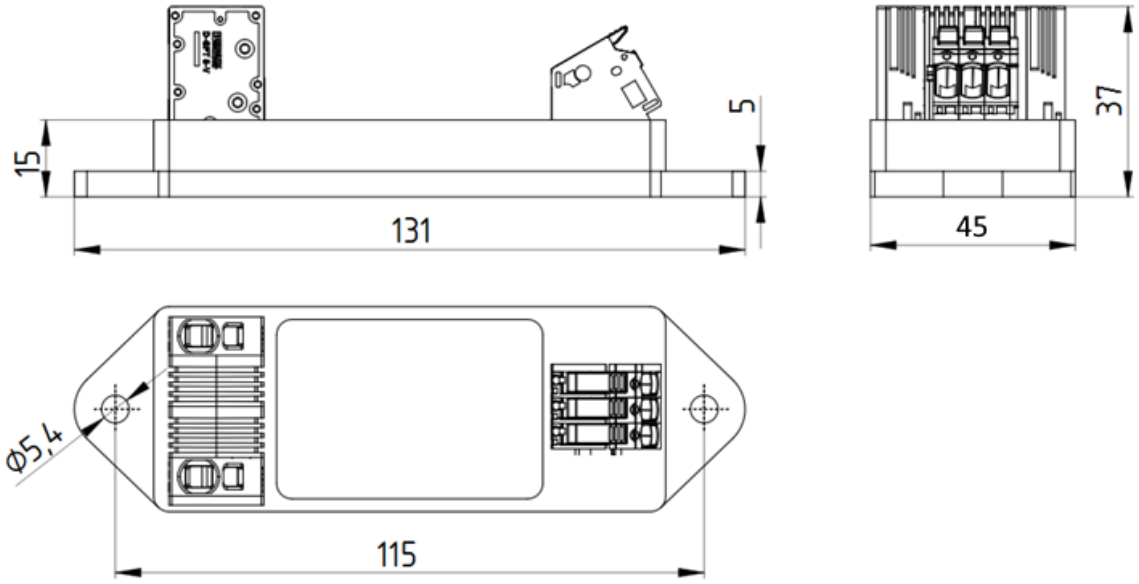


FIGURE 3, CONNECTION EXAMPLE

MECHANICAL DIMENSIONS



Notes:

- All dimensions in millimeters (mm)
- Body shall be mounted with two M5 screws, one on each side