SIEMENS

## Data sheet 6ES7231-4HF32-0XB0



Figure similar

SIMATIC S7-1200, Analog input, SM 1231, 8 AI, +/-10 V, +/-5 V, +/-2.5 V, or 0-20 mA/4-20 mA, 12 bit+sign or (13 bit ADC)

| | |
|---|---|
| **General information** | |
| Product type designation | SM 1231, AI 8x13 bit |
| **Supply voltage** | |
| Rated value (DC) | 24 V |
| **Input current** | |
| Current consumption, typ. | 60 mA |
| from backplane bus 5 V DC, typ. | 90 mA |
| **Power loss** | |
| Power loss, typ. | 1.5 W |
| **Analog inputs** | |
| Number of analog inputs | 8; Current or voltage differential inputs |
| permissible input voltage for voltage input (destruction limit), max. | 35 V |
| permissible input current for current input (destruction limit), max. | 40 mA |
| Cycle time (all channels) max. | 625 µs |
| Input ranges | |
| ● Voltage | Yes; ±10V, ±5V, ±2.5V |
| ● Current | Yes; 4 to 20 mA, 0 to 20 mA |
| ● Thermocouple | No |
| ● Resistance thermometer | No |
| ● Resistance | No |
| Input ranges (rated values), voltages | |
| ● -10 V to +10 V | Yes |
| — Input resistance (-10 V to +10 V) | ≥9 MOhm |
| ● -2.5 V to +2.5 V | Yes |
| — Input resistance (-2.5 V to +2.5 V) | ≥9 MOhm |
| ● -5 V to +5 V | Yes |
| — Input resistance (-5 V to +5 V) | ≥9 MOhm |
| Input ranges (rated values), currents | |
| ● 0 to 20 mA | Yes |
| — Input resistance (0 to 20 mA) | 280 Ω |
| ● 4 mA to 20 mA | Yes |
| — Input resistance (4 mA to 20 mA) | 280 Ω |
| Thermocouple (TC) | |
| Temperature compensation | |
| — Parameterizable | No |
| **Analog value generation for the inputs** | |


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| | |
|---|---|
| Integration and conversion time/resolution per channel | |
| ● Resolution with overrange (bit including sign), max. | 12 bit; + sign |
| ● Integration time, parameterizable | Yes |
| ● Interference voltage suppression for interference frequency f1 in Hz | 40 dB, DC to 60 V for interference frequency 50 / 60 Hz |
| Smoothing of measured values | |
| ● parameterizable | Yes |
| ● Step: None | Yes |
| ● Step: low | Yes |
| ● Step: Medium | Yes |
| ● Step: High | Yes |
| **Errors/accuracies** | |
| Temperature error (relative to input range), (+/-) | 25 °C ±0.1%, to 55 °C ±0.2% total measurement range |
| Basic error limit (operational limit at 25 °C) | |
| ● Voltage, relative to input range, (+/-) | 0.1 % |
| ● Current, relative to input range, (+/-) | 0.1 % |
| Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency | |
| ● Common mode voltage, max. | 12 V |
| **Interrupts/diagnostics/status information** | |
| Alarms | Yes |
| Diagnostics function | Yes |
| Alarms | |
| ● Diagnostic alarm | Yes |
| Diagnoses | |
| ● Monitoring the supply voltage | Yes |
| ● Wire break | Yes |
| Diagnostics indication LED | |
| ● for status of the inputs | Yes |
| ● for maintenance | Yes |
| **Degree and class of protection** | |
| IP degree of protection | IP20 |
| **Standards, approvals, certificates** | |
| CE mark | Yes |
| CSA approval | Yes |
| UL approval | Yes |
| cULus | Yes |
| FM approval | Yes |
| RCM (formerly C-TICK) | Yes |
| KC approval | Yes |
| Marine approval | Yes |
| Ecological footprint | |
| ● environmental product declaration | Yes |
| Global warming potential | |
| — global warming potential, (total) [CO2 eq] | 43.1 kg |
| — global warming potential, (during production) [CO2 eq] | 7.62 kg |
| — global warming potential, (during operation) [CO2 eq] | 36 kg |
| — global warming potential, (after end of life cycle) [CO2 eq] | -0.544 kg |
| **Ambient conditions** | |
| Free fall | |
| ● Fall height, max. | 0.3 m; five times, in product package |
| Ambient temperature during operation | |
| ● min. | -20 °C |
| ● max. | 60 °C |
| ● horizontal installation, min. | -20 °C |
| ● horizontal installation, max. | 60 °C |
| ● vertical installation, min. | -20 °C |
| ● vertical installation, max. | 50 °C |


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| | |
|---|---|
| Ambient temperature during storage/transportation | |
| ● min. | -40 °C |
| ● max. | 70 °C |
| Air pressure acc. to IEC 60068-2-13 | |
| ● Operation, min. | 795 hPa |
| ● Operation, max. | 1 080 hPa |
| ● Storage/transport, min. | 660 hPa |
| ● Storage/transport, max. | 1 080 hPa |
| Relative humidity | |
| ● Operation at 25 °C without condensation, max. | 95 % |
| Pollutant concentrations | |
| ● SO2 at RH < 60% without condensation | S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60 % condensation-free |
| **Connection method** | |
| required front connector | Yes |
| **Mechanics/material** | |
| Enclosure material (front) | |
| ● Plastic | Yes |
| **Dimensions** | |
| Width | 45 mm |
| Height | 100 mm |
| Depth | 75 mm |
| **Weights** | |
| Weight, approx. | 180 g |

**Classifications**

| | Version | Classification |
|---|---|---|
| eClass | 16 | 27-24-22-01 |
| eClass | 14 | 27-24-22-01 |
| eClass | 12 | 27-24-22-01 |
| eClass | 9.1 | 27-24-22-01 |
| eClass | 9 | 27-24-22-01 |
| eClass | 8 | 27-24-22-01 |
| eClass | 7.1 | 27-24-22-01 |
| eClass | 6 | 27-24-22-01 |
| ETIM | 10 | EC001420 |
| ETIM | 9 | EC001420 |
| ETIM | 8 | EC001420 |
| ETIM | 7 | EC001420 |
| IDEA | 4 | 3562 |
| UNSPSC | 15 | 32-15-17-05 |

**Approvals / Certificates**

| General Product Approval | Test Certificates | other |
|---|---|---|
| EAC, CE EG-Konf., UKCA | Type Test Certificates/Test Report | Confirmation, 产品合格 QC PASS |

| Dangerous goods | Environment |
|---|---|
| Transport Information | Environmental Confirmations |

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