SIEMENS

## Data sheet 6ES7231-5QF50-0XB0



SIMATIC S7-1200 G2, SM 1231 TC, AI 8x TC module, type J or K

| | |
|---|---|
| **General information** | |
| Product type designation | SM 1231, AI 8x16 bit TC |
| **Supply voltage** | |
| Rated value (DC) | 24 V |
| permissible range, lower limit (DC) | 20.4 V |
| permissible range, upper limit (DC) | 28.8 V |
| **Input current** | |
| Current consumption, typ. | 15 mA |
| from backplane bus 5 V DC, typ. | 40 mA |
| **Power loss** | |
| Power loss, typ. | 0.6 W |
| **Analog inputs** | |
| Number of analog inputs | 8; Thermocouples |
| permissible input voltage for voltage input (destruction limit), max. | ±35 V |
| Technical unit for temperature measurement adjustable | Degrees Celsius/degrees Fahrenheit |
| Input ranges | |
| ● Voltage | Yes |
| ● Current | No |
| ● Thermocouple | Yes; J, K, T, E, R & S, B, N, C, TXK/XK(L); voltage range: ±80 mV |
| ● Resistance thermometer | No |
| ● Resistance | No |
| Input ranges (rated values), voltages | |
| ● -80 mV to +80 mV | Yes |
| — Input resistance (-80 mV to +80 mV) | >= 10 MOhm |
| Input ranges (rated values), thermocouples | |
| ● type B | Yes |
| ● type C | Yes |
| ● Type E | Yes |
| ● Type J | Yes |
| ● Type K | Yes |
| ● Type N | Yes |
| ● Type R | Yes |
| ● Type S | Yes |
| ● Type T | Yes |
| ● Type TXK/TXK(L) to GOST | Yes |
| Thermocouple (TC) | |
| Temperature compensation | |
| — Parameterizable | Yes |


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|---|---|
| Cable length | |
| ● shielded, max. | 100 m; to the sensor |
| **Analog value generation for the inputs** | |
| Measurement principle | integrating |
| Integration and conversion time/resolution per channel | |
| ● Resolution with overrange (bit including sign), max. | 15 bit; + sign |
| ● Integration time, parameterizable | Yes |
| ● Interference voltage suppression for interference frequency f1 in Hz | 85 dB at 10 / 50 / 60 / 400 Hz |
| Smoothing of measured values | |
| ● Parameterizable | Yes |
| ● Step: None | Yes |
| ● Step: low | Yes |
| ● Step: Medium | Yes |
| ● Step: High | Yes |
| **Errors/accuracies** | |
| cold connection point | ±1,5 °C |
| Temperature error (relative to input range), (+/-) | 25 °C ±0.05 % / -20 °C to 60 °C ±0.1 % of the full-scale range |
| Repeat accuracy in steady state at 25 °C (relative to input range), (+/-) | 0.05 % |
| Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency | |
| ● Common mode interference, min. | 120 dB |
| **Interrupts/diagnostics/status information** | |
| Alarms | Yes |
| Diagnostics function | Yes; Can be read out |
| Alarms | |
| ● Diagnostic alarm | Yes |
| Diagnoses | |
| ● Monitoring the supply voltage | Yes |
| ● Wire break | Yes |
| Diagnostics indication LED | |
| ● DIAG LED | Yes |
| ● for status of the inputs | Yes |
| **Potential separation** | |
| Potential separation analog inputs | |
| ● between the channels and the power supply of the electronics | Yes |
| **Isolation** | |
| Isolation tested with | 707 V DC (type test) |
| tested with | |
| ● Between channels | 120 V AC |
| **Degree and class of protection** | |
| IP degree of protection | IP20 |
| **Standards, approvals, certificates** | |
| CE mark | Yes |
| CSA approval | No |
| UL approval | Yes |
| cULus | Yes |
| FM approval | No |
| RCM (formerly C-TICK) | Yes |
| KC approval | Yes |
| Marine approval | No |
| **Ambient conditions** | |
| Free fall | |
| ● Fall height, max. | 0.3 m; five times, in product package |
| Ambient temperature during operation | |
| ● horizontal installation, min. | -20 °C |
| ● horizontal installation, max. | 60 °C; at max. voltages and max. specification |
| ● vertical installation, min. | -20 °C |


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|---|---|
| ● vertical installation, max. | 50 °C; at max. voltages and max. specification |
| Ambient temperature during storage/transportation | |
| ● min. | -40 °C |
| ● max. | 70 °C |
| Air pressure acc. to IEC 60068-2-13 | |
| ● Operation, min. | 540 hPa |
| ● Operation, max. | 1 140 hPa |
| ● Storage/transport, min. | 540 hPa |
| ● Storage/transport, max. | 1 140 hPa |
| Altitude during operation relating to sea level | |
| ● Installation altitude, min. | -1 000 m |
| ● Installation altitude, max. | 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual |
| Relative humidity | |
| ● Operation, max. | 95 %; no condensation |
| Vibrations | |
| ● Vibration resistance during operation acc. to IEC 60068-2-6 | 3.5 mm from 5 - 8.4 Hz, 1g from 8.4 - 150 Hz |
| ● Operation, tested according to IEC 60068-2-6 | Yes |
| Shock testing | |
| ● tested according to IEC 60068-2-27 | Yes; IEC 68, Part 2-27; half-sine, 15 g, 11 ms |
| 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 | 30 mm |
| Height | 125 mm |
| Depth | 100 mm |
| **Weights** | |
| Weight, approx. | 171 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 |

**Approvals / Certificates**

**General Product Approval**

Manufacturer Declaration | Miscellaneous | China RoHS

| General Product Approval | EMV | For use in hazardous locations | Environment |
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Manufacturer Declaration

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