SIEMENS

## Data sheet 6ES7331-1KF02-0AB0



Figure similar

***spare part*** SIMATIC S7-300, analog input SM 331, isolated 8 AI, resolution 13 bit U/I/resistance/Pt100, NI100, NI1000, LG-NI1000, PTC/KTY, 66 ms conversion time; 1x 40-pole

| | |
|---|---|
| **General information** | |
| Product function | |
| ● Isochronous mode | No |
| **Input current** | |
| from backplane bus 5 V DC, max. | 90 mA |
| **Power loss** | |
| Power loss, typ. | 0.4 W |
| **Analog inputs** | |
| Number of analog inputs | 8 |
| ● For resistance measurement | 8 |
| permissible input voltage for voltage input (destruction limit), max. | 30 V; 12 V continuous, 30 V for max. 1 s |
| permissible input current for current input (destruction limit), max. | 40 mA |
| Input ranges | |
| ● Voltage | Yes |
| ● Current | Yes |
| ● Thermocouple | No |
| ● Resistance thermometer | Yes |
| ● Resistance | Yes |
| Input ranges (rated values), voltages | |
| ● 0 to +10 V | Yes |
| — Input resistance (0 to 10 V) | 100 kΩ |
| ● 1 V to 5 V | Yes |
| — Input resistance (1 V to 5 V) | 100 kΩ |
| ● 1 V to 10 V | No |
| ● -1 V to +1 V | Yes |
| — Input resistance (-1 V to +1 V) | 100 kΩ |
| ● -10 V to +10 V | Yes |
| — Input resistance (-10 V to +10 V) | 100 kΩ |
| ● -2.5 V to +2.5 V | No |
| ● -250 mV to +250 mV | No |
| ● -5 V to +5 V | Yes |
| — Input resistance (-5 V to +5 V) | 100 kΩ |
| ● -50 mV to +50 mV | Yes |
| — Input resistance (-50 mV to +50 mV) | 100 kΩ |
| ● -500 mV to +500 mV | Yes |
| — Input resistance (-500 mV to +500 mV) | 100 kΩ |


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| | |
|---|---|
| ● -80 mV to +80 mV | No |
| Input ranges (rated values), currents | |
| ● 0 to 20 mA | Yes |
| — Input resistance (0 to 20 mA) | 100 Ω |
| ● -10 mA to +10 mA | No |
| ● -20 mA to +20 mA | Yes |
| — Input resistance (-20 mA to +20 mA) | 100 Ω |
| ● -3.2 mA to +3.2 mA | No |
| ● 4 mA to 20 mA | Yes |
| — Input resistance (4 mA to 20 mA) | 100 Ω |
| Input ranges (rated values), thermocouples | |
| ● type B | No |
| ● type C | No |
| ● Type E | No |
| ● Type J | No |
| ● Type K | No |
| ● Type L | No |
| ● Type N | No |
| ● Type R | No |
| ● Type S | No |
| ● Type T | No |
| ● Type U | No |
| ● Type TXK/TXK(L) to GOST | No |
| Input ranges (rated values), resistance thermometer | |
| ● Cu 10 | No |
| ● Ni 100 | Yes; Standard/climate |
| — Input resistance (Ni 100) | 100 MΩ |
| ● Ni 1000 | Yes |
| — Input resistance (Ni 1000) | 100 MΩ |
| ● LG-Ni 1000 | Yes; Standard/climate |
| — Input resistance (LG-Ni 1000) | 100 MΩ |
| ● Ni 120 | No |
| ● Ni 200 | No |
| ● Ni 500 | No |
| ● Pt 100 | Yes; Standard/climate |
| — Input resistance (Pt 100) | 100 MΩ |
| ● Pt 1000 | No |
| ● Pt 200 | No |
| ● Pt 500 | No |
| Input ranges (rated values), resistors | |
| ● 0 to 150 ohms | No |
| ● 0 to 300 ohms | No |
| ● 0 to 600 ohms | Yes |
| — Input resistance (0 to 600 ohms) | 100 MΩ |
| ● 0 to 6000 ohms | Yes |
| — Input resistance (0 to 6000 ohms) | 100 MΩ |
| Thermocouple (TC) | |
| Temperature compensation | |
| — Parameterizable | No |
| — internal temperature compensation | No |
| — external temperature compensation with compensations socket | No |
| Characteristic linearization | |
| ● Parameterizable | Yes |
| — for thermocouples | No |
| — for resistance thermometer | yes; Pt100 standard/air con.; Ni100 standard/air con.; Ni1000 standard/air con.; LG-Ni1000 standard/air con. |
| Cable length | |
| ● shielded, max. | 200 m; max. 50 m at 50 mV |


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|---|---|
| **Analog value generation for the inputs** | |
| Integration and conversion time/resolution per channel | |
| ● Resolution with overrange (bit including sign), max. | 13 bit |
| ● Integration time, parameterizable | Yes; 60 / 50 ms |
| ● Basic conversion time (ms) | 66 / 55 ms |
| ● Interference voltage suppression for interference frequency f1 in Hz | 50 / 60 Hz |
| **Encoder** | |
| Connection of signal encoders | |
| ● for voltage measurement | Yes |
| ● for current measurement as 2-wire transducer | Yes; with external supply |
| ● for current measurement as 4-wire transducer | Yes |
| ● for resistance measurement with two-wire connection | Yes |
| ● for resistance measurement with three-wire connection | Yes |
| ● for resistance measurement with four-wire connection | Yes |
| **Errors/accuracies** | |
| Operational error limit in overall temperature range | |
| ● Voltage, relative to input range, (+/-) | 0.6 %; ±0.6 % (±5 V, 10 V, 1 to 5 V, 0 to 10 V); ±0.5 % (±50 mV, 500 mV, 1 V) |
| ● Current, relative to input range, (+/-) | 0.5 %; ±20 mA, 0 to 20 mA, 4 to 20 mA |
| ● Resistance, relative to input range, (+/-) | 0.5 %; 0 to 6 kohms, 0 to 600 kohms |
| ● Resistance thermometer, relative to input range, (+/-) | 1 Kelvin (Pt100, Ni100, climatic; Ni1000, LG-Ni1000, standard; Ni1000, LG-Ni1000, climatic); 1.2 Kelvin (Pt100, Ni100, standard) |
| Basic error limit (operational limit at 25 °C) | |
| ● Voltage, relative to input range, (+/-) | 0.4 %; 0.4% (±5 V, 10 V, 1 to 5 V, 0 to 10 V); 0.3% (±50 mV, 500 mV, 1 V) |
| ● Current, relative to input range, (+/-) | 0.3 %; ±20 mA, 0 to 20 mA, 4 to 20 mA |
| ● Resistance, relative to input range, (+/-) | 0.3 %; 0 to 6 kohms, 0 to 600 kohms |
| ● Resistance thermometer, relative to input range, (+/-) | 1 Kelvin (Pt100, Ni100, standard); 0.8 Kelvin (Pt100, Ni100, climatic; Ni1000, LG-Ni1000, standard; Ni1000, LG-Ni1000, climatic) |
| **Interrupts/diagnostics/status information** | |
| Diagnostics function | No |
| Alarms | |
| ● Diagnostic alarm | No |
| ● Limit value alarm | No |
| Diagnoses | |
| ● Diagnostic information readable | No |
| Diagnostics indication LED | |
| ● Group error SF (red) | No |
| **Potential separation** | |
| Potential separation analog inputs | |
| ● between the channels | No |
| ● between the channels and backplane bus | Yes |
| **Isolation** | |
| Isolation tested with | 500 V DC |
| **Connection method** | |
| required front connector | 40-pin |
| **Dimensions** | |
| Width | 40 mm |
| Height | 125 mm |
| Depth | 117 mm |
| **Weights** | |
| Weight, approx. | 250 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 |


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| | | |
|---|---|---|
| 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






Miscellaneous

Manufacturer Declaration




Metrological Approval

### General Product Approval






Manufacturer Declaration

China RoHS

### EMV






### EMV




### For use in hazardous locations




FM






Miscellaneous

### For use in hazardous locations




CCC-Ex

### Maritime application








NK / Nippon Kaiji Kyokai

### Maritime application






CCS (China Classification Society)

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