SIEMENS

## Data sheet 6ES7331-7KF02-0AB0



Figure similar

***spare part*** SIMATIC S7-300, analog input SM 331, isolated, 8 AI, resolution 9/12/14 bits, U/I/thermocouple/resistor, alarm, diagnostics, 1x 20-pole removing/inserting with active backplane bus

| | |
|---|---|
| **General information** | |
| Product function | |
| ● Isochronous mode | No |
| **Supply voltage** | |
| Load voltage L+ | |
| ● Rated value (DC) | 24 V |
| ● Reverse polarity protection | Yes |
| **Input current** | |
| from load voltage L+ (without load), max. | 30 mA |
| from backplane bus 5 V DC, max. | 50 mA |
| **Power loss** | |
| Power loss, typ. | 1 W |
| **Analog inputs** | |
| Number of analog inputs | 8 |
| ● For resistance measurement | 4 |
| permissible input voltage for voltage input (destruction limit), max. | 20 V; continuous; 75 V for max. 1 s (mark to space ratio 1:20) |
| permissible input current for current input (destruction limit), max. | 40 mA |
| Constant measurement current for resistance-type transmitter, typ. | 1.67 mA |
| Input ranges | |
| ● Voltage | Yes |
| ● Current | Yes |
| ● Thermocouple | Yes |
| ● Resistance thermometer | Yes |
| ● Resistance | Yes |
| Input ranges (rated values), voltages | |
| ● 0 to +10 V | No |
| ● 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) | 10 MΩ |
| ● -10 V to +10 V | Yes |
| — Input resistance (-10 V to +10 V) | 100 kΩ |
| ● -2.5 V to +2.5 V | Yes |
| — Input resistance (-2.5 V to +2.5 V) | 100 kΩ |
| ● -250 mV to +250 mV | Yes |


Subject to change without notice
© Copyright Siemens

| | |
|---|---|
| — Input resistance (-250 mV to +250 mV) | 10 MΩ |
| ● -5 V to +5 V | Yes |
| — Input resistance (-5 V to +5 V) | 100 kΩ |
| ● -50 mV to +50 mV | No |
| ● -500 mV to +500 mV | Yes |
| — Input resistance (-500 mV to +500 mV) | 10 MΩ |
| ● -80 mV to +80 mV | Yes |
| — Input resistance (-80 mV to +80 mV) | 10 MΩ |
| Input ranges (rated values), currents | |
| ● 0 to 20 mA | Yes |
| — Input resistance (0 to 20 mA) | 25 Ω |
| ● -10 mA to +10 mA | Yes |
| — Input resistance (-10 mA to +10 mA) | 25 Ω |
| ● -20 mA to +20 mA | Yes |
| — Input resistance (-20 mA to +20 mA) | 25 Ω |
| ● -3.2 mA to +3.2 mA | Yes |
| — Input resistance (-3.2 mA to +3.2 mA) | 25 Ω |
| ● 4 mA to 20 mA | Yes |
| — Input resistance (4 mA to 20 mA) | 25 Ω |
| Input ranges (rated values), thermocouples | |
| ● Type B | No |
| ● Type C | No |
| ● Type E | Yes |
| — Input resistance (Type E) | 10 MΩ |
| ● Type J | Yes |
| — Input resistance (type J) | 10 MΩ |
| ● Type K | Yes |
| — Input resistance (Type K) | 10 MΩ |
| ● Type L | Yes |
| — Input resistance (Type L) | 10 MΩ |
| ● Type N | Yes |
| — Input resistance (Type N) | 10 MΩ |
| ● 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 |
| — Input resistance (Ni 100) | 10 MΩ |
| ● Ni 1000 | No |
| ● LG-Ni 1000 | No |
| ● Ni 120 | No |
| ● Ni 200 | No |
| ● Ni 500 | No |
| ● Pt 100 | Yes; Standard |
| — Input resistance (Pt 100) | 10 MΩ |
| ● Pt 1000 | No |
| ● Pt 200 | No |
| ● Pt 500 | No |
| Input ranges (rated values), resistors | |
| ● 0 to 150 ohms | Yes |
| — Input resistance (0 to 150 ohms) | 10 MΩ |
| ● 0 to 300 ohms | Yes |
| — Input resistance (0 to 300 ohms) | 10 MΩ |
| ● 0 to 600 ohms | Yes |
| — Input resistance (0 to 600 ohms) | 10 MΩ |
| ● 0 to 6000 ohms | No |


© Copyright Siemens

| | |
|---|---|
| Thermocouple (TC) | |
| Temperature compensation | |
| — Parameterizable | Yes |
| — internal temperature compensation | Yes |
| — external temperature compensation with compensations socket | Yes |
| — for definable comparison point temperature | Yes |
| Characteristic linearization | |
| ● Parameterizable | Yes |
| — for thermocouples | Type E, J, K, L, N |
| — for resistance thermometer | Pt100 (standard, climatic range), Ni100 (standard, climatic range) |
| Cable length | |
| ● shielded, max. | 200 m; 50 m at 80 mV and thermocouples |
| **Analog value generation for the inputs** | |
| Integration and conversion time/resolution per channel | |
| ● Resolution with overrange (bit including sign), max. | 15 bit; Unipolar: 9/12/12/14 bit; bipolar: 9 bit + sign/12 bit + sign/12 bit + sign/14 bit + sign |
| ● Integration time, parameterizable | Yes; 2,5 / 16,67 / 20 / 100 ms |
| ● Basic conversion time (ms) | 3 / 17 / 22 / 102 ms |
| ● Interference voltage suppression for interference frequency f1 in Hz | 400 / 60 / 50 / 10 Hz |
| **Encoder** | |
| Connection of signal encoders | |
| ● for voltage measurement | Yes |
| ● for current measurement as 2-wire transducer | Yes |
| ● 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, (+/-) | 1 %; ±1% (80 mV); ±0.6% (250 mV to 1 000 mV); ±0.8% (2.5 V to 10 V) |
| ● Current, relative to input range, (+/-) | 0.7 %; From 3.2 to 20 mA |
| ● Resistance, relative to input range, (+/-) | 0.7 %; 150, 300, 600 Ohm |
| ● Resistance thermometer, relative to input range, (+/-) | 0.7 %; ±0.7 % (Pt100/ Ni100); ±0.8 % (Pt100 climate) |
| ● Thermocouple, relative to input range, (+/-) | 1.1 %; Type E, J, K, L, N |
| Basic error limit (operational limit at 25 °C) | |
| ● Voltage, relative to input range, (+/-) | 0.6 %; ±0.4 % (250 mV to 1 000 mV); ±0.6 % (2.5 mV to 10 mV); ±0.7 % (80 mV) |
| ● Current, relative to input range, (+/-) | 0.5 %; 3.2 to 20 mA |
| ● Resistance, relative to input range, (+/-) | 0.5 %; 150, 300, 600 Ohm |
| ● Resistance thermometer, relative to input range, (+/-) | 0.6 %; ±0.5% (Pt100/ Ni100), ±0.6% (Pt100 climate) |
| ● Thermocouple, relative to input range, (+/-) | 0.7 %; Type E, N, J, K, L |
| **Interrupts/diagnostics/status information** | |
| Diagnostics function | Yes; Parameterizable |
| Alarms | |
| ● Diagnostic alarm | Yes; Parameterizable, channels 0 and 2 |
| ● Limit value alarm | Yes; Parameterizable |
| Diagnoses | |
| ● Diagnostic information readable | Yes |
| Diagnostics indication LED | |
| ● Group error SF (red) | Yes |
| **Potential separation** | |
| Potential separation analog inputs | |
| ● between the channels | No |
| ● between the channels and backplane bus | Yes |
| ● between the channels and the power supply of the electronics | Yes |
| **Isolation** | |
| Isolation tested with | 500 V DC |


© Copyright Siemens

| | |
|---|---|
| **Connection method** | |
| required front connector | 20-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 |
| 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**

China RoHS | Manufacturer Declaration

**EMV**

**EMV**

**For use in hazardous locations**

FM | Miscellaneous

**For use in hazardous locations**

CCC-Ex

**Maritime application**

NK / Nippon Kaiji Kyokai

**Maritime application**


© Copyright Siemens







CCS (China Classification Society)

**last modified:** 4/7/2025


Subject to change without notice
© Copyright Siemens