

SIMATIC S7-300, Analog input SM 331, single channel Isolated 250 V AC, 6 AI thermocouples Type B, E, J, K, L, N, R, S, T Voltage: +/- 25mV to +/-1V 16 bit, 50ms, 1x 40-pole



Figure similar

| Supply voltage | |
|---|---|
| Load voltage L+ | |
| • Rated value (DC) | 24 V |
| • Reverse polarity protection | Yes |
| Input current | |
| from load voltage L+ (without load), max. | 150 mA |
| from backplane bus 5 V DC, max. | 100 mA |
| Power loss | |
| Power loss, typ. | 2.2 W |
| Analog inputs | |
| Number of analog inputs | 6 |
| permissible input voltage for voltage input (destruction limit), max. | 35 V; 35 V continuous, 75 V for max. 1 s (mark to space ratio 1:20) |
| Input ranges | |
| • Voltage | Yes |
| • Current | No |

| | |
|---|---------------|
| • Thermocouple | Yes |
| • Resistance thermometer | No |
| • Resistance | No |
| Input ranges (rated values), voltages | |
| • 0 to +10 V | No |
| • 1 V to 5 V | No |
| • 1 V to 10 V | No |
| • -1 V to +1 V | Yes |
| — Input resistance (-1 V to +1 V) | 10 M Ω |
| • -10 V to +10 V | No |
| • -2.5 V to +2.5 V | No |
| • -250 mV to +250 mV | Yes |
| — Input resistance (-250 mV to +250 mV) | 10 M Ω |
| • -5 V to +5 V | No |
| • -50 mV to +50 mV | Yes |
| — Input resistance (-50 mV to +50 mV) | 10 M Ω |
| • -500 mV to +500 mV | Yes |
| — Input resistance (-500 mV to +500 mV) | 10 M Ω |
| • -80 mV to +80 mV | Yes |
| — Input resistance (-80 mV to +80 mV) | 10 M Ω |
| Input ranges (rated values), currents | |
| • 0 to 20 mA | No |
| • -10 mA to +10 mA | No |
| • -20 mA to +20 mA | No |
| • -3.2 mA to +3.2 mA | No |
| • 4 mA to 20 mA | No |
| Input ranges (rated values), thermocouples | |
| • Type B | Yes |
| — Input resistance (Type B) | 10 M Ω |
| • Type C | Yes |
| — Input resistance (Type C) | 10 M Ω |
| • Type E | Yes |
| — Input resistance (Type E) | 10 M Ω |
| • Type J | Yes |
| — Input resistance (type J) | 10 M Ω |
| • Type K | Yes |
| — Input resistance (Type K) | 10 M Ω |
| • Type L | Yes |
| — Input resistance (Type L) | 10 M Ω |
| • Type N | Yes |
| — Input resistance (Type N) | 10 M Ω |

| | |
|---|-------|
| • Type R | Yes |
| — Input resistance (Type R) | 10 MΩ |
| • Type S | Yes |
| — Input resistance (Type S) | 10 MΩ |
| • Type T | Yes |
| — Input resistance (Type T) | 10 MΩ |
| • Type U | Yes |
| — Input resistance (Type U) | 10 MΩ |
| • Type TXK/TXK(L) to GOST | Yes |
| — Input resistance (Type TXK/TXK(L) to GOST) | 10 MΩ |
| Input ranges (rated values), resistance thermometer | |
| • Cu 10 | No |
| • Ni 100 | No |
| • Ni 1000 | No |
| • LG-Ni 1000 | No |
| • Ni 120 | No |
| • Ni 200 | No |
| • Ni 500 | No |
| • Pt 100 | No |
| • 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 | No |
| • 0 to 6000 ohms | No |
| Thermocouple (TC) | |
| Temperature compensation | |
| — parameterizable | Yes |
| — internal temperature compensation | Yes |
| — external temperature compensation with Pt100 | Yes |
| — external temperature compensation with compensations socket | Yes |
| — for definable comparison point temperature | Yes |
| Characteristic linearization | |
| • parameterizable | Yes |
| Cable length | |
| • shielded, max. | 200 m |

| Analog value generation for the inputs | |
|--|---|
| Integration and conversion time/resolution per channel | |
| <ul style="list-style-type: none"> Resolution with overrange (bit including sign), max. | 16 bit; Two's complement |
| <ul style="list-style-type: none"> Integration time, parameterizable | Yes |
| <ul style="list-style-type: none"> Basic conversion time (ms) | 30 / 50 / 60 / 300 ms |
| <ul style="list-style-type: none"> Integration time (ms) | 10/ 16.67/ 20/ 100 ms |
| <ul style="list-style-type: none"> Interference voltage suppression for interference frequency f1 in Hz | 10 / 50 / 60 / 400 Hz |
| Encoder | |
| Connection of signal encoders | |
| <ul style="list-style-type: none"> for voltage measurement | Yes |
| Errors/accuracies | |
| Operational error limit in overall temperature range | |
| <ul style="list-style-type: none"> Voltage, relative to input range, (+/-) | Operating error at 0 ... 60 °C: $\pm 0.12\%$ @ ± 25 mV, $\pm 0.08\%$ @ ± 50 mV, $\pm 0.6\%$ @ ± 80 mV, $\pm 0.05\%$ @ ± 250 mV, $\pm 0.05\%$ @ 500 mV, $\pm 0.05\%$ @ ± 1 V |
| <ul style="list-style-type: none"> Thermocouple, relative to input range, (+/-) | See manual for details |
| Basic error limit (operational limit at 25 °C) | |
| <ul style="list-style-type: none"> Voltage, relative to input range, (+/-) | See manual for details |
| <ul style="list-style-type: none"> Thermocouple, relative to input range, (+/-) | See manual for details |
| Interrupts/diagnostics/status information | |
| Diagnostics function | Yes; Parameterizable |
| Alarms | |
| <ul style="list-style-type: none"> Diagnostic alarm | Yes; channel by channel |
| <ul style="list-style-type: none"> Limit value alarm | Yes; Parameterizable |
| <ul style="list-style-type: none"> Hardware interrupt | Yes; Parameterizable |
| Diagnostic messages | |
| <ul style="list-style-type: none"> Diagnostic information readable | Yes |
| Diagnostics indication LED | |
| <ul style="list-style-type: none"> Group error SF (red) | Yes |
| Potential separation | |
| Potential separation analog inputs | |
| <ul style="list-style-type: none"> between the channels | Yes |
| <ul style="list-style-type: none"> between the channels, in groups of | 1 |
| <ul style="list-style-type: none"> between the channels and backplane bus | Yes |
| <ul style="list-style-type: none"> between the channels and the power supply of the electronics | Yes |
| Isolation | |
| Isolation tested with | 2 500 V DC |

| Connection method | |
|--------------------------|------------|
| required front connector | 40-pin |
| Dimensions | |
| Width | 40 mm |
| Height | 125 mm |
| Depth | 120 mm |
| Weights | |
| Weight, approx. | 272 g |
| last modified: | 05/09/2020 |