

SIMATIC S7-300, ANALOG INPUT SM 331, INDIVIDUALLY ISOLATED AC250V, 6 AI THERMOCOUPLE, TYPE B, E, J, K, L, N, R, S, T VOLTAGE: +/-25MV BIS +/-1V 16 BIT, 50 MS, 1 X 40 PIN



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
<b>Input ranges (rated values), voltages</b>	
• 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 $\Omega$
• -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 $\Omega$
• -5 V to +5 V	No
• -50 mV to +50 mV	Yes
• Input resistance (-50 mV to +50 mV)	10 M $\Omega$
• -500 mV to +500 mV	Yes
• Input resistance (-500 mV to +500 mV)	10 M $\Omega$
• -80 mV to +80 mV	Yes
• Input resistance (-80 mV to +80 mV)	10 M $\Omega$
<b>Input ranges (rated values), currents</b>	
• 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
<b>Input ranges (rated values), thermocouples</b>	
• Type B	Yes
• Input resistance (Type B)	10 M $\Omega$
• Type C	Yes
• Input resistance (Type C)	10 M $\Omega$
• Type E	Yes
• Input resistance (Type E)	10 M $\Omega$
• Type J	Yes
• Input resistance (type J)	10 M $\Omega$
• Type K	Yes
• Input resistance (Type K)	10 M $\Omega$
• Type L	Yes
• Input resistance (Type L)	10 M $\Omega$
• Type N	Yes
• Input resistance (Type N)	10 M $\Omega$
• Type R	Yes
• Input resistance (Type R)	10 M $\Omega$

• 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
<b>Input ranges (rated values), resistance thermometer</b>	
• 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
<b>Input ranges (rated values), resistors</b>	
• 0 to 150 ohms	No
• 0 to 300 ohms	No
• 0 to 600 ohms	No
• 0 to 6000 ohms	No
<b>Thermocouple (TC)</b>	
<b>Temperature compensation</b>	
— parameterizable	Yes
— internal temperature compensation	Yes
— external temperature compensation with compensations socket	Yes
— external temperature compensation with Pt100	Yes
<b>Characteristic linearization</b>	
• parameterizable	Yes
— for thermocouples	Type B, E, J, K, L, N, R, S, T, U, C, TXK, XK(L)
— for resistance thermometer	No
<b>Cable length</b>	
• shielded, max.	200 m
<b>Analog value generation</b>	
Measurement principle	integrating

Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit; Two's complement
• Integration time, parameterizable	Yes
• Basic conversion time (ms)	30 / 50 / 60 / 300 ms
• Integration time (ms)	10/ 16.67/ 20/ 100 ms
• Interference voltage suppression for interference frequency f1 in Hz	10 / 50 / 60 / 400 Hz

### Errors/accuracies

Operational error limit in overall temperature range	
• Voltage, relative to input area, (+/-)	Operating error at 0 ... 60 °C: $\pm 0.12\%$ @ $\pm 25$ mV, $\pm 0.08\%$ @ $\pm 50$ mV, $\pm 0.6\%$ @ $\pm 80$ mV, $\pm 0.05\%$ @ $\pm 250$ mV, $\pm 0.05\%$ @ 500 mV, $\pm 0.05\%$ @ $\pm 1$ V
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input area, (+/-)	See manual for details

### Interrupts/diagnostics/status information

Diagnostic functions	Yes; Parameterizable
Alarms	
• Diagnostic alarm	Yes; channel by channel
• Limit value alarm	Yes; Parameterizable
Diagnostic messages	
• Diagnostic information readable	Yes
Diagnostics indication LED	
• Group error SF (red)	Yes

### Potential separation

Potential separation analog inputs	
• between the channels and backplane bus	Yes

### Isolation

Isolation tested with	2500 V DC
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### Connection method

required front connector	40-pin
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### Dimensions

Width	40 mm
Height	125 mm
Depth	120 mm

### Weights

Weight, approx.	272 g
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**last modified:** 18.12.2015