



Figure similar

spare part 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: +/-25 mV to +/-
1 V 16 bit, 50 ms, 1x 40-pole

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)
Constant measurement current for resistance-type transmitter, typ.	0.7 mA
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 MΩ
• -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 MΩ
• -5 V to +5 V	No
• -50 mV to +50 mV	Yes
— Input resistance (-50 mV to +50 mV)	10 MΩ
• -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	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 MΩ
• Type C	Yes
— Input resistance (Type C)	10 MΩ
• 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	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
— for thermocouples	Type B, E, J, K, L, N, R, S, T, U, C, TXK, XK(L)

— for resistance thermometer	No		
Cable length			
• shielded, max.	200 m		
Analog value generation for the inputs			
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		
Encoder			
Connection of signal encoders			
• for voltage measurement	Yes		
Errors/accuracies			
Operational error limit in overall temperature range			
• Voltage, relative to input range, (+/-)	Operating error at 0 ... 60 °C: ±0.12% @ ±25 mV, ±0.08% @ ±50 mV, ±0.6% @ ±80 mV, ±0.05% @ ±250 mV, ±0.05% @ 500 mV, ±0.05% @ ±1 V		
• Thermocouple, relative to input range, (+/-)	See manual for details		
Basic error limit (operational limit at 25 °C)			
• Voltage, relative to input range, (+/-)	See manual for details		
• Thermocouple, relative to input range, (+/-)	See manual for details		
Interrupts/diagnostics/status information			
Diagnostics function	Yes; Parameterizable		
Alarms			
• Diagnostic alarm	Yes; channel by channel		
• Limit value alarm	Yes; Parameterizable		
• Hardware interrupt	Yes; Parameterizable		
Diagnoses			
• Diagnostic information readable	Yes		
Diagnostics indication LED			
• Group error SF (red)	Yes		
Potential separation			
Potential separation analog inputs			
• between the channels	Yes		
• between the channels, in groups of	1		
• between the channels and backplane bus	Yes		
• 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		
Classifications			
		Version	Classification
	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](#)
[China RoHS](#)



General Product ApprovalEMVFor use in hazardous locations

[Metrological Approval](#)






For use in hazardous locations

[FM](#)




[Miscellaneous](#)
[CCC-Ex](#)

Maritime application





[NK / Nippon Kaiji Kyokai](#)



Maritime application

[CCS \(China Classification Society\)](#)

last modified: 4/7/2025