



Figure similar

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

Supply voltage	
Load voltage L+	
<ul style="list-style-type: none"> Rated value (DC) 	24 V
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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	
<ul style="list-style-type: none"> Voltage Current Thermocouple Resistance thermometer Resistance 	Yes Yes Yes Yes Yes
Input ranges (rated values), voltages	
<ul style="list-style-type: none"> 0 to +10 V 	No
<ul style="list-style-type: none"> 1 V to 5 V 	Yes
<ul style="list-style-type: none"> — Input resistance (1 V to 5 V) 	100 kΩ
<ul style="list-style-type: none"> 1 V to 10 V 	No
<ul style="list-style-type: none"> -1 V to +1 V 	Yes
<ul style="list-style-type: none"> — Input resistance (-1 V to +1 V) 	10 MΩ
<ul style="list-style-type: none"> -10 V to +10 V 	Yes
<ul style="list-style-type: none"> — Input resistance (-10 V to +10 V) 	100 kΩ
<ul style="list-style-type: none"> -2.5 V to +2.5 V 	Yes
<ul style="list-style-type: none"> — Input resistance (-2.5 V to +2.5 V) 	100 kΩ
<ul style="list-style-type: none"> -250 mV to +250 mV 	Yes
<ul style="list-style-type: none"> — Input resistance (-250 mV to +250 mV) 	10 MΩ
<ul style="list-style-type: none"> -5 V to +5 V 	Yes
<ul style="list-style-type: none"> — 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 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	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 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	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 M Ω
• 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 M Ω
• 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 M Ω
• 0 to 300 ohms	Yes
— Input resistance (0 to 300 ohms)	10 M Ω
• 0 to 600 ohms	Yes
— Input resistance (0 to 600 ohms)	10 M Ω
• 0 to 6000 ohms	No
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

connection method / header	
required front connector	20-pin
Dimensions	
Width	40 mm
Height	125 mm
Depth	117 mm
Weights	
Weight, approx.	250 g
last modified:	3/2/2021 