



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 <ul style="list-style-type: none"> — Input resistance (1 V to 5 V) 	Yes 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 <ul style="list-style-type: none"> — Input resistance (-1 V to +1 V) 	Yes 10 MΩ
<ul style="list-style-type: none"> -10 V to +10 V <ul style="list-style-type: none"> — Input resistance (-10 V to +10 V) 	Yes 100 kΩ
<ul style="list-style-type: none"> -2.5 V to +2.5 V <ul style="list-style-type: none"> — Input resistance (-2.5 V to +2.5 V) 	Yes 100 kΩ
<ul style="list-style-type: none"> -250 mV to +250 mV <ul style="list-style-type: none"> — Input resistance (-250 mV to +250 mV) 	Yes 10 MΩ

<ul style="list-style-type: none"> ● -5 V to +5 V <ul style="list-style-type: none"> — Input resistance (-5 V to +5 V) ● -50 mV to +50 mV ● -500 mV to +500 mV <ul style="list-style-type: none"> — Input resistance (-500 mV to +500 mV) ● -80 mV to +80 mV <ul style="list-style-type: none"> — Input resistance (-80 mV to +80 mV) 	<p>Yes</p> <p>100 kΩ</p> <p>No</p> <p>Yes</p> <p>10 MΩ</p> <p>Yes</p> <p>10 MΩ</p>
Input ranges (rated values), currents	
<ul style="list-style-type: none"> ● 0 to 20 mA <ul style="list-style-type: none"> — Input resistance (0 to 20 mA) ● -10 mA to +10 mA <ul style="list-style-type: none"> — Input resistance (-10 mA to +10 mA) ● -20 mA to +20 mA <ul style="list-style-type: none"> — Input resistance (-20 mA to +20 mA) ● -3.2 mA to +3.2 mA <ul style="list-style-type: none"> — Input resistance (-3.2 mA to +3.2 mA) ● 4 mA to 20 mA <ul style="list-style-type: none"> — Input resistance (4 mA to 20 mA) 	<p>Yes</p> <p>25 Ω</p> <p>Yes</p> <p>25 Ω</p> <p>Yes</p> <p>25 Ω</p> <p>Yes</p> <p>25 Ω</p> <p>Yes</p> <p>25 Ω</p>
Input ranges (rated values), thermocouples	
<ul style="list-style-type: none"> ● Type B ● Type C ● Type E <ul style="list-style-type: none"> — Input resistance (Type E) ● Type J <ul style="list-style-type: none"> — Input resistance (type J) ● Type K <ul style="list-style-type: none"> — Input resistance (Type K) ● Type L <ul style="list-style-type: none"> — Input resistance (Type L) ● Type N <ul style="list-style-type: none"> — Input resistance (Type N) ● Type R ● Type S ● Type T ● Type U ● Type TXK/TXK(L) to GOST 	<p>No</p> <p>No</p> <p>Yes</p> <p>10 MΩ</p> <p>Yes</p> <p>10 MΩ</p> <p>Yes</p> <p>10 MΩ</p> <p>Yes</p> <p>10 MΩ</p> <p>Yes</p> <p>10 MΩ</p> <p>No</p> <p>No</p> <p>No</p> <p>No</p> <p>No</p> <p>No</p>
Input ranges (rated values), resistance thermometer	
<ul style="list-style-type: none"> ● Cu 10 ● Ni 100 <ul style="list-style-type: none"> — Input resistance (Ni 100) ● Ni 1000 ● LG-Ni 1000 ● Ni 120 ● Ni 200 ● Ni 500 ● Pt 100 <ul style="list-style-type: none"> — Input resistance (Pt 100) ● Pt 1000 ● Pt 200 ● Pt 500 	<p>No</p> <p>Yes; Standard</p> <p>10 MΩ</p> <p>No</p> <p>No</p> <p>No</p> <p>No</p> <p>No</p> <p>Yes; Standard</p> <p>10 MΩ</p> <p>No</p> <p>No</p> <p>No</p>
Input ranges (rated values), resistors	
<ul style="list-style-type: none"> ● 0 to 150 ohms <ul style="list-style-type: none"> — Input resistance (0 to 150 ohms) ● 0 to 300 ohms <ul style="list-style-type: none"> — Input resistance (0 to 300 ohms) ● 0 to 600 ohms <ul style="list-style-type: none"> — Input resistance (0 to 600 ohms) ● 0 to 6000 ohms 	<p>Yes</p> <p>10 MΩ</p> <p>Yes</p> <p>10 MΩ</p> <p>Yes</p> <p>10 MΩ</p> <p>No</p>

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
- between the channels and the power supply of the electronics

Yes
Yes

Isolation

Isolation tested with	500 V DC
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Connection method

required front connector	20-pin
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Dimensions

Width	40 mm
Height	125 mm
Depth	117 mm

Weights

Weight, approx.	250 g
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last modified: 3/2/2021 