

SIPLUS S7-300 SM331 - 20-POLE -25 ... +70 DGR C WITH CONFORMAL COATING BASED ON 6ES7331-7KB02-0AB0 . ANALOG INPUT GALVANICALLY ISOLATED 2 AI, AUFL. 9/12/14 BIT, U/I/THERMOEL./RESISTOR, ALARM, DIAGNOSTICS, 1 X 20-POLE, REMOVE/INSERT W. ACT. BACKPLANE BUS



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.	80 mA
from backplane bus 5 V DC, max.	50 mA
Power loss	
Power loss, typ.	1.3 W
Analog inputs	
Number of analog inputs	2
• For resistance measurement	1
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

Input ranges	
• Voltage	Yes
• Current	Yes
• Thermocouple	Yes
• Resistance thermometer	Yes
• Resistance	Yes
Input ranges (rated values), voltages	
• 0 to +10 V	No
• 1 V to 5 V	Yes
• Input resistance (1 V to 5 V)	100 k Ω
• 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	Yes
• Input resistance (-10 V to +10 V)	100 k Ω
• -2.5 V to +2.5 V	Yes
• Input resistance (-2.5 V to +2.5 V)	100 k Ω
• -250 mV to +250 mV	Yes
• Input resistance (-250 mV to +250 mV)	10 M Ω
• -5 V to +5 V	Yes
• Input resistance (-5 V to +5 V)	100 k Ω
• -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 E	Yes
• Input resistance (Type E)	10 M Ω
• Type J	Yes

• Input resistance (type J)	10 MΩ
• Type K	Yes
• Input resistance (Type K)	10 MΩ
• Type L	No
• Type N	Yes
• Input resistance (Type N)	10 MΩ
• 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
• Input resistance (Ni 100)	10 MΩ; Standard
• Pt 100	Yes
• Input resistance (Pt 100)	10 kΩ; Standard
Input ranges (rated values), resistors	
• 0 to 150 ohms	Yes
• Input resistance (0 to 150 ohms)	10 MΩ
• 0 to 300 ohms	Yes
• Input resistance (0 to 300 ohms)	10 MΩ
• 0 to 600 ohms	Yes
• Input resistance (0 to 600 ohms)	10 MΩ
• 0 to 6000 ohms	No
Thermocouple (TC)	
Temperature compensation	
— parameterizable	Yes
— internal temperature compensation	Yes
— external temperature compensation with compensations socket	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	
Measurement principle	integrating
Integration and conversion time/resolution per channel	

- Resolution with overrange (bit including sign), max.
- Integration time, parameterizable
- Interference voltage suppression for interference frequency f1 in Hz

15 bit; Unipolar: 9/12/12/14 bit; bipolar: 9 bit + sign/12 bit + sign/12 bit + sign/14 bit + sign
 Yes; 2,5 / 16,67 / 20 / 100 ms
 400 / 60 / 50 / 10 Hz

Encoder

Connection of signal encoders

- | | |
|---|-----|
| • 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) @ 0 ... +60 °C; ±1.3% (80 mV); ±0.8% (250 mV to 1 000 mV); ±1% (2.5 V to 10 V) @ -25 ... +70 °C |
| • Current, relative to input range, (+/-) | 0.7 %; @ 0 ... +60 °C; ±0.9% @ -25 ... +70 °C; from 3.2 mA to 20 mA |
| • Resistance, relative to input range, (+/-) | 0.7 %; @ 0 ... +60 °C; ±0.9% @ -25 ... +70 °C; 150, 300, 600 ohm |
| • Resistance thermometer, relative to input range, (+/-) | 0.7 %; ±0.7 % (Pt100 / Ni100); ±0.8 % (Pt100 climate) @ 0 ... +60 °C; ±0.9 % (Pt100 / Ni100); ±1 % (Pt100 climate) @ -25 ... +70 °C |

Basic error limit (operational limit at 25 °C)

- | | |
|--|---|
| • Voltage, relative to input range, (+/-) | 0.6 %; ±0.6% (80 mV, 2.5 V to 10 V); ±0.4% (250 mV to 1 000 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) |

Interrupts/diagnostics/status information

Diagnostic functions Yes; Parameterizable

Alarms

- | | |
|---------------------|---------------------------------|
| • Diagnostic alarm | Yes |
| • Limit value alarm | Yes; Parameterizable, channel 0 |

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	500 V DC
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes; File E239877
FM approval	Yes; CofC 3028431
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
Railway application	
• EN 50121-4	No
• EN 50155	No
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Extended ambient conditions	
• relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity	
— With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
— against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
— against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
— against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!
Connection method	
required front connector	20-pin
Dimensions	
Width	40 mm
Height	125 mm

Depth	120 mm
Weights	
Weight, approx.	250 g
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