



Figure similar

SIPLUS S7-300 SM 331 2AI 20-pole based on 6ES7331-7KB02-0AB0 with conformal coating, -25...+70 °C, analog input isolated 2 AI, resolution 9/12/14 bits, U/I/thermocouple/resistor, alarm, diagnostics, 1x 20-pole, removing/inserting with active backplane bus

General information	
based on	6ES7331-7KB02-0AB0
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
Constant measurement current for resistance-type transmitter, typ.	1.67 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 kΩ
• 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	Yes
— Input resistance (-10 V to +10 V)	100 kΩ
• -2.5 V to +2.5 V	Yes
— Input resistance (-2.5 V to +2.5 V)	100 kΩ
• -250 mV to +250 mV	Yes
— Input resistance (-250 mV to +250 mV)	10 MΩ
• -5 V to +5 V	Yes

— 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 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	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 MΩ
• 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
— 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.
- Integration time, parameterizable
- Interference voltage suppression for interference frequency f_1 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 voltage measurement
- for current measurement as 2-wire transducer
- for current measurement as 4-wire transducer
- for resistance measurement with two-wire connection
- for resistance measurement with three-wire connection
- for resistance measurement with four-wire connection

Yes
 Yes
 Yes
 Yes
 Yes
 Yes

Errors/accuracies

Operational error limit in overall temperature range

- Voltage, relative to input range, (+/-)
- Current, relative to input range, (+/-)
- Resistance, relative to input range, (+/-)
- Resistance thermometer, relative to input range, (+/-)
- Thermocouple, relative to input range, (+/-)

1 %; $\pm 1\%$ (80 mV); $\pm 0.6\%$ (250 mV to 1 000 mV); $\pm 0.8\%$ (2.5 V to 10 V) @ 0 ... +60 °C; $\pm 1.3\%$ (80 mV); $\pm 0.8\%$ (250 mV to 1 000 mV); $\pm 1\%$ (2.5 V to 10 V) @ -25 ... +70 °C
 0.7 %; @ 0 ... +60 °C; $\pm 0.9\%$ @ -25 ... +70 °C; from 3.2 mA to 20 mA
 0.7 %; @ 0 ... +60 °C; $\pm 0.9\%$ @ -25 ... +70 °C; 150, 300, 600 ohm
 0.7 %; $\pm 0.7\%$ (Pt100 / Ni100); $\pm 0.8\%$ (Pt100 climate) @ 0 ... +60 °C; $\pm 0.9\%$ (Pt100 / Ni100); $\pm 1\%$ (Pt100 climate) @ -25 ... +70 °C
 1.1 %; @ 0 ... +60 °C; 1.3 % @ -25 ... +70 °C; type E, J, K, L, N

Basic error limit (operational limit at 25 °C)

- Voltage, relative to input range, (+/-)
- Current, relative to input range, (+/-)
- Resistance, relative to input range, (+/-)
- Resistance thermometer, relative to input range, (+/-)
- Thermocouple, relative to input range, (+/-)

0.6 %; $\pm 0.6\%$ (80 mV, 2.5 V to 10 V); $\pm 0.4\%$ (250 mV to 1 000 mV)
 0.5 %; 3.2 to 20 mA
 0.5 %; 150, 300, 600 Ohm
 0.6 %; $\pm 0.5\%$ (Pt100/ Ni100), $\pm 0.6\%$ (Pt100 climate)
 0.7 %; Type E, N, J, K, L

Interrupts/diagnostics/status information

Diagnostics function

Yes; Parameterizable

Alarms

- Diagnostic alarm
- Limit value alarm

Yes
 Yes; Parameterizable, channel 0

Diagnoses

- Diagnostic information readable

Yes

Diagnostics indication LED

- Group error SF (red)

Yes

Potential separation

Potential separation analog inputs

- between the channels
- between the channels and backplane bus
- between the channels and the power supply of the electronics

No
 Yes
 Yes; Not for 2-wire transmitters

Isolation

Isolation tested with

500 V DC

Standards, approvals, certificates

CE mark

Yes

UL approval

Yes; File E239877

RCM (formerly C-TICK)

Yes

KC approval

Yes

EAC (formerly Gost-R)

Yes

Railway application

- EN 50121-4
- EN 50155

No
 No

Ambient conditions

Ambient temperature during operation

- min.
- max.

-25 °C; = Tmin
 70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use

Ambient temperature during storage/transportation

- min.
- max.

-40 °C
 70 °C

Altitude during operation relating to sea level	
- Installation altitude above sea level, max. - Ambient air temperature-barometric pressure-altitude	5 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 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	
Use in stationary industrial systems	
— to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
— to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
— to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
— to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
— to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
— to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Usage in industrial process technology	
— Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
— Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
— Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over 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

last modified:

5/29/2024 