



Figure similar

spare part SIPLUS S7-300 SM 331 8 AI based on 6ES7331-1KF02-0AB0 with conformal coating, -25...+70 °C, isolated 8 AI, resolution 13 bit U/I/resistance/Pt100, NI100, NI1000, LG-NI1000, PTC/KTY, 66 ms conversion time; 1x 40-pole

General information	
based on	6ES7331-1KF02-0AB0
Product function	
• Isochronous mode	No
Input current	
from backplane bus 5 V DC, max.	90 mA
Power loss	
Power loss, typ.	0.4 W
Analog inputs	
Number of analog inputs	8
• For resistance measurement	8
permissible input voltage for voltage input (destruction limit), max.	30 V; 12 V continuous, 30 V for max. 1 s
permissible input current for current input (destruction limit), max.	40 mA
Input ranges	
• Voltage	Yes
• Current	Yes
• Thermocouple	No
• Resistance thermometer	Yes
• Resistance	Yes
Input ranges (rated values), voltages	
• 0 to +10 V	Yes
— Input resistance (0 to 10 V)	100 kΩ
• 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)	100 kΩ
• -10 V to +10 V	Yes
— Input resistance (-10 V to +10 V)	100 kΩ
• -2.5 V to +2.5 V	No
• -250 mV to +250 mV	No
• -5 V to +5 V	Yes
— Input resistance (-5 V to +5 V)	100 kΩ
• -50 mV to +50 mV	Yes
— Input resistance (-50 mV to +50 mV)	100 kΩ
• -500 mV to +500 mV	Yes

— Input resistance (-500 mV to +500 mV)	100 kΩ
• -80 mV to +80 mV	No
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
— Input resistance (0 to 20 mA)	100 Ω
• -10 mA to +10 mA	No
• -20 mA to +20 mA	Yes
— Input resistance (-20 mA to +20 mA)	100 Ω
• -3.2 mA to +3.2 mA	No
• 4 mA to 20 mA	Yes
— Input resistance (4 mA to 20 mA)	100 Ω
Input ranges (rated values), thermocouples	
• type B	No
• type C	No
• Type E	No
• Type J	No
• Type K	No
• Type L	No
• Type N	No
• 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/climate
— Input resistance (Ni 100)	100 MΩ
• Ni 1000	Yes
— Input resistance (Ni 1000)	100 MΩ
• LG-Ni 1000	Yes; Standard/climate
— Input resistance (LG-Ni 1000)	100 MΩ
• Ni 120	No
• Ni 200	No
• Ni 500	No
• Pt 100	Yes; Standard/climate
— Input resistance (Pt 100)	100 MΩ
• 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	Yes
— Input resistance (0 to 600 ohms)	100 MΩ
• 0 to 6000 ohms	Yes
— Input resistance (0 to 6000 ohms)	100 MΩ
Characteristic linearization	
• Parameterizable	Yes
— for resistance thermometer	yes; Pt100 standard/air con.; Ni100 standard/air con.; Ni1000 standard/air con.; LG-Ni1000 standard/air con.
Cable length	
• shielded, max.	200 m; max. 50 m at 50 mV
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	13 bit
• Integration time, parameterizable	Yes; 60 / 50 ms
• Basic conversion time (ms)	66 / 55 ms
• Interference voltage suppression for interference	50 / 60 Hz

frequency f1 in Hz

Encoder

Connection of signal encoders

- | | |
|---|---------------------------|
| • for voltage measurement | Yes |
| • for current measurement as 2-wire transducer | Yes; with external supply |
| • 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, (+/-) | 0.6 %; ± 0.6 % (± 5 V, 10 V, 1 to 5 V, 0 to 10 V); ± 0.5 % (± 50 mV, 500 mV, 1 V) @ 0 ... +60 °C; ± 0.7 % (± 5 V, 10 V, 1 to 5 V, 0 to 10 V); ± 0.6 % (± 50 mV, 500 mV, 1 V) @ -25 ... +70 °C |
| • Current, relative to input range, (+/-) | 0.5 %; @ 0 ... +60 °C; ± 0.6 % @ -25 ... +70 °C; ± 20 mA, 0 to 20 mA, 4 to 20 mA |
| • Resistance, relative to input range, (+/-) | 0.5 %; @ 0 ... +60 °C; 0.6 % @ -25 ... +70 °C; 0 to 6 kohm, 0 to 600 kohm |
| • Resistance thermometer, relative to input range, (+/-) | 1 Kelvin (Pt100, Ni100, climate; Ni1000, LG-Ni1000, standard; Ni1000, LG-Ni1000, climate); 1.2 Kelvin (Pt100, Ni100, standard) @ 0 ... +60 °C; 1.2 Kelvin (Pt100, Ni100, climate; Ni1000, LG-Ni1000, standard; Ni1000, LG-Ni1000, climate); 1.4 Kelvin (Pt100, Ni100, standard) @ -25 ... +70 °C |

Basic error limit (operational limit at 25 °C)

- | | |
|--|--|
| • Voltage, relative to input range, (+/-) | 0.4 %; 0.4 % (± 5 V, 10 V, 1 to 5 V, 0 to 10 V); 0.3 % (± 50 mV, 500 mV, 1 V) |
| • Current, relative to input range, (+/-) | 0.3 %; ± 20 mA, 0 to 20 mA, 4 to 20 mA |
| • Resistance, relative to input range, (+/-) | 0.3 %; 0 to 6 kohms, 0 to 600 kohms |
| • Resistance thermometer, relative to input range, (+/-) | 1 Kelvin (Pt100, Ni100, standard); 0.8 Kelvin (Pt100, Ni100, climatic; Ni1000, LG-Ni1000, standard; Ni1000, LG-Ni1000, climatic) |

Interrupts/diagnostics/status information

Diagnostics function No

Alarms

- | | |
|---------------------|----|
| • Diagnostic alarm | No |
| • Limit value alarm | No |

Diagnoses

- | | |
|-----------------------------------|----|
| • Diagnostic information readable | No |
|-----------------------------------|----|

Diagnostics indication LED

- | | |
|------------------------|----|
| • Group error SF (red) | No |
|------------------------|----|

Potential separation

Potential separation analog inputs

- | | |
|--|-----|
| • between the channels | No |
| • 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
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 |
| • max. | 70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use |

Altitude during operation relating to sea level

- | | |
|--|---|
| • Installation altitude above sea level, max. | 5 000 m |
| • Ambient air temperature-barometric pressure-altitude | 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- | 100 %; RH incl. condensation/frost (no commissioning under condensation) |
|---|--|

2-38, max.	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	40-pin

Dimensions	
Width	40 mm
Height	125 mm
Depth	117 mm

Weights	
Weight, approx.	250 g

Classifications			
		Version	Classification
	eClass	16	27-24-22-01
	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



[Manufacturer Declaration](#)



[China RoHS](#)



EMV	For use in hazardous locations
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[CCC-Ex](#)

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