SIEMENS

Data sheet 6ES7331-1KF02-0AB0

Figure similar

spare part SIMATIC S7-300, analog input SM 331, 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	
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
Thermocouple (TC)	
Temperature compensation	
— Parameterizable	No
— internal temperature compensation	No
— external temperature compensation with compensations socket	No
Characteristic linearization	
● Parameterizable	Yes
— for thermocouples	No
— 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 frequency f1 in Hz	50 / 60 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)
● Current, relative to input range, (+/-)	0.5 %; ±20 mA, 0 to 20 mA, 4 to 20 mA
● Resistance, relative to input range, (+/-)	0.5 %; 0 to 6 kohms, 0 to 600 kohms
● Resistance thermometer, relative to input range, (+/-)	1 Kelvin (Pt100, Ni100, climatic; Ni1000, LG-Ni1000, standard; Ni1000, LG-Ni1000, climatic); 1.2 Kelvin (Pt100, Ni100, standard)
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
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	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

Miscellaneous

Manufacturer Declaration

Metrological Approval

General Product Approval

Manufacturer Declaration

China RoHS

EMV

EMV

For use in hazardous locations

FM

Miscellaneous

For use in hazardous locations

CCC-Ex

Maritime application

NK / Nippon Kaiji Kyokai

Maritime application

CCS (China Classification Society)

last modified: 4/7/2025