

Overview

- Analog inputs
- For connection of voltage and current sensors, thermocouples, resistors and resistance thermometers

Technical specifications

| Article number | 6ES7331-7KF02-0AB0 SM331, 8AI, 9/12/14BIT | 6ES7331-7HF01-0AB0 SM331, 8AI, 14BIT, 0,052MS/CHANNEL | 6ES7331-1KF02-0AB0 SM331, 8AI, 13BIT | 6ES7331-7KB02-0AB0 SM331, 2AI, 9/12/14BIT |
|---|--|--|--|--|
| Product type designation | | | | |
| Supply voltage | | | | |
| Load voltage L+ | | | | |
| • Rated value (DC) | 24 V | 24 V | | 24 V |
| • Reverse polarity protection | Yes | Yes | | Yes |
| Input current | | | | |
| from load voltage L+ (without load), max. | 30 mA | 50 mA | | 80 mA |
| from backplane bus 5 V DC, max. | 50 mA | 60 mA | 90 mA | 50 mA |
| Power losses | | | | |
| Power loss, typ. | 1 W | 1.5 W | 0.4 W | 1.3 W |
| Analog inputs | | | | |
| Number of analog inputs | 8 | 8 | 8 | 2 |
| • For resistance measurement | 4 | | 8 | 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) | 20 V; 20 V DC permanent, 75 V DC for max. 1 s (duty factor 1:20) | 30 V; 12 V continuous, 30 V for max. 1 s | 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 | 40 mA | 40 mA | 40 mA |
| Input ranges (rated values), voltages | | | | |
| • 0 to +10 V | No | No | Yes | No |
| • 1 V to 5 V | Yes | Yes | Yes | Yes |
| • 1 V to 10 V | No | | No | No |
| • -1 V to +1 V | Yes | Yes | Yes | Yes |
| • -10 V to +10 V | Yes | Yes | Yes | Yes |
| • -2.5 V to +2.5 V | Yes | | No | Yes |
| • -250 mV to +250 mV | Yes | | No | Yes |
| • -5 V to +5 V | Yes | Yes | Yes | Yes |
| • -50 mV to +50 mV | No | | Yes | No |
| • -500 mV to +500 mV | Yes | Yes | Yes | Yes |
| • -80 mV to +80 mV | Yes | Yes | No | Yes |
| Input ranges (rated values), currents | | | | |
| • 0 to 20 mA | Yes | Yes | Yes | Yes |
| • -10 mA to +10 mA | Yes | | No | Yes |
| • -20 mA to +20 mA | Yes | Yes | Yes | Yes |
| • -3.2 mA to +3.2 mA | Yes | | No | Yes |
| • 4 mA to 20 mA | Yes | Yes | Yes | Yes |

SIMATIC S7-300 advanced controller

I/O modules

Analog modules

SM 331 analog input modules**Technical specifications** (continued)

| Article number | 6ES7331-7KF02-0AB0 SM331, 8AI, 9/12/14BIT | 6ES7331-7HF01-0AB0 SM331, 8AI, 14BIT, 0,052MS/CHANNEL | 6ES7331-1KF02-0AB0 SM331, 8AI, 13BIT | 6ES7331-7KB02-0AB0 SM331, 2AI, 9/12/14BIT |
|--|--|--|--|--|
| Input ranges (rated values), thermoelements | | | | |
| • Type B | No | | No | No |
| • Type E | Yes | | No | Yes |
| • Type J | Yes | | No | Yes |
| • Type K | Yes | | No | Yes |
| • Type L | Yes | | No | No |
| • Type N | Yes | | No | Yes |
| • Type R | No | | No | No |
| • Type S | No | | No | No |
| • Type T | No | | No | No |
| • Type U | No | | No | No |
| • Type TXK/TXK(L) to GOST | No | | No | No |
| Input ranges (rated values), resistance thermometer | | | | |
| • Cu 10 | No | | No | No |
| • Ni 100 | Yes; Standard | | Yes; Standard/climate | Yes |
| • Ni 1000 | No | | Yes | No |
| • LG-Ni 1000 | No | | Yes; Standard/climate | No |
| • Ni 120 | No | | No | No |
| • Ni 200 | No | | No | No |
| • Ni 500 | No | | No | No |
| • Pt 100 | Yes; Standard | | Yes; Standard/climate | Yes |
| • Pt 1000 | No | | No | No |
| • Pt 200 | No | | No | No |
| • Pt 500 | No | | No | No |
| Input ranges (rated values), resistors | | | | |
| • 0 to 150 ohms | Yes | | No | Yes |
| • 0 to 300 ohms | Yes | | No | Yes |
| • 0 to 600 ohms | Yes | | Yes | Yes |
| • 0 to 6000 ohms | No | | Yes | No |
| Thermocouple (TC) | | | | |
| Temperature compensation | | | | |
| - Parameterizable | Yes | | No | Yes |
| - internal temperature compensation | Yes | | No | Yes |
| - external temperature compensation with compensations socket | Yes | | No | Yes |
| Characteristic linearization | | | | |
| • Parameterizable | Yes | | Yes | Yes |
| - for thermocouples | Type E, J, K, L, N | | No | Type E, J, K, L, N |
| - for resistance thermometer | Pt100 (standard, climatic range), Ni100 (standard, climatic range) | | yes; Pt100 standard/air con.; Ni100 standard/air con.; Ni1000 standard/air con.; LG-Ni1000 standard/air con. | Pt100 (standard, climatic range), Ni100 (standard, climatic range) |
| Cable length | | | | |
| • shielded, max. | 200 m; 50 m at 80 mV and thermocouples | 200 m | 200 m; max. 50 m at 50 mV | 200 m; 50 m at 80 mV and thermocouples |

Technical specifications (continued)

| Article number | 6ES7331-7KF02-0AB0 SM331, 8AI, 9/12/14BIT | 6ES7331-7HF01-0AB0 SM331, 8AI, 14BIT, 0,052MS/CHANNEL | 6ES7331-1KF02-0AB0 SM331, 8AI, 13BIT | 6ES7331-7KB02-0AB0 SM331, 2AI, 9/12/14BIT |
|--|--|--|---|--|
| Analog value creation | | | | |
| Measurement principle | integrating | Actual value encryption | integrating | integrating |
| Integration and conversion time/resolution per channel | | | | |
| <ul style="list-style-type: none"> Resolution with overrange (bit including sign), max. | 15 bit; Unipolar: 9/12/12/14 bits; bipolar: 9 bits + sign/ 12 bits + sign/12 bits + sign/ 14 bits + sign | 14 bit; Unipolar: 14 bits; bipolar: 13 bits + sign | 13 bit | 15 bit; Unipolar: 9/12/12/14 bits; bipolar: 9 bits + sign/ 12 bits + sign/12 bits + sign/ 14 bits + sign |
| <ul style="list-style-type: none"> Integration time, parameterizable | Yes; 2,5 / 16,67 / 20 / 100 ms | Yes | Yes; 60 / 50 ms | Yes; 2,5 / 16,67 / 20 / 100 ms |
| <ul style="list-style-type: none"> Basic conversion time (ms) | 3 / 17 / 22 / 102 ms | 52 µs per channel | 66 / 55 ms | 3 / 17 / 22 / 102 ms |
| <ul style="list-style-type: none"> Interference voltage suppression for interference frequency f1 in Hz | 10 / 50 / 60 / 400 Hz | none / 400 / 60 / 50 Hz | 50 / 60 Hz | 10 / 50 / 60 / 400 Hz |
| Encoder | | | | |
| Connection of signal encoders | | | | |
| <ul style="list-style-type: none"> for current measurement as 2-wire transducer | Yes | Yes | Yes; with external supply | Yes |
| <ul style="list-style-type: none"> for current measurement as 4-wire transducer | Yes | Yes | Yes | Yes |
| <ul style="list-style-type: none"> for resistance measurement with two-wire connection | Yes | | Yes | Yes |
| <ul style="list-style-type: none"> for resistance measurement with three-wire connection | Yes | | Yes | Yes |
| <ul style="list-style-type: none"> for resistance measurement with four-wire connection | Yes | | Yes | Yes |
| Errors/accuracies | | | | |
| Operational limit in overall temperature range | | | | |
| <ul style="list-style-type: none"> Voltage, relative to input area, (+/-) | 1 %; ±1% (80 mV); ±0.6% (250 mV to 1 000 mV); ±0.8% (2.5 V to 10 V) | 0.4 % | 0.6 %; +/-0.6% (+/-5 V, 10 V, 1 to 5 V, 0 to 10 V); +/-0.5% (+/-50 mV, 500 mV, 1 V) | 1 %; ±1% (80 mV); ±0.6% (250 mV to 1 000 mV); ±0.8% (2.5 V to 10 V) |
| <ul style="list-style-type: none"> Current, relative to input area, (+/-) | 0.7 %; From 3.2 to 20 mA | 0.3 % | 0.5 %; +/-20 mA, 0 to 20 mA, 4 to 20 mA | 0.7 %; From 3.2 to 20 mA |
| <ul style="list-style-type: none"> Resistance, relative to input area, (+/-) | 0.7 %; 150, 300, 600 Ohm | | 0.5 %; 0 to 6 kohms, 0 to 600 kohms | 0.7 %; 150, 300, 600 Ohm |
| <ul style="list-style-type: none"> Resistance thermometer, relative to input area, (+/-) | 0.7 %; +/-0.7% (Pt100/ Ni100); +/-0.8% (Pt100 climate) | | 1 Kelvin (Pt100, Ni100, climatic; Ni1000, LG-Ni1000, standard; Ni1000, LG-Ni1000, climatic); 1.2 Kelvin (Pt100, Ni100, standard) | 0.7 %; +/-0.7% (Pt100/ Ni100); +/-0.8% (Pt100 climate) |
| Basic error limit (operational limit at 25 °C) | | | | |
| <ul style="list-style-type: none"> Voltage, relative to input area, (+/-) | 0.6 %; +/-0.4% (250 to 1000 mV); +/-0.6 % (2.5 to 10 mV); +/-0.7 % (80 mV) | 0.25 % | 0.4 %; 0.4% (+/-5 V, 10 V, 1 to 5 V, 0 to 10 V); 0.3% (+/-50 mV, 500 mV, 1 V) | 0.6 %; ±0.6% (80 mV, 2.5 V to 10 V); ±0.4% (250 mV to 1 000 mV) |
| <ul style="list-style-type: none"> Current, relative to input area, (+/-) | 0.5 %; 3.2 to 20 mA | 0.2 % | 0.3 %; +/-20 mA, 0 to 20 mA, 4 to 20 mA | 0.5 %; 3.2 to 20 mA |
| <ul style="list-style-type: none"> Resistance, relative to input area, (+/-) | 0.5 %; 150, 300, 600 Ohm | | 0.3 %; 0 to 6 kohms, 0 to 600 kohms | 0.5 %; 150, 300, 600 Ohm |
| <ul style="list-style-type: none"> Resistance thermometer, relative to input area, (+/-) | 0.6 %; ±0.5% (Pt100/ Ni100), ±0.6% (Pt100 climate) | | 1 Kelvin (Pt100, Ni100, standard); 0.8 Kelvin (Pt100, Ni100, climatic; Ni1000, LG-Ni1000, standard; Ni1000, LG-Ni1000, climatic) | 0.6 %; ±0.5% (Pt100/ Ni100), ±0.6% (Pt100 climate) |

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I/O modules

Analog modules

SM 331 analog input modules**Technical specifications (continued)**

| Article number | 6ES7331-7KF02-0AB0 SM331, 8AI, 9/12/14BIT | 6ES7331-7HF01-0AB0 SM331, 8AI, 14BIT, 0,052MS/CHANNEL | 6ES7331-1KF02-0AB0 SM331, 8AI, 13BIT | 6ES7331-7KB02-0AB0 SM331, 2AI, 9/12/14BIT | |
|---|--|---|--|---|---|
| Isochronous mode | | | | | |
| Isochronous operation (application synchronized up to terminal) | No | Yes | No | No | |
| Interrupts/diagnostics/ status information | | | | | |
| Alarms | | | | | |
| • Diagnostic alarm | Yes; Parameterizable, channels 0 and 2 | Yes; Parameterizable | No | Yes | |
| • Limit value alarm | Yes; Parameterizable | Yes; Parameterizable, channels 0 and 2 | No | Yes; Parameterizable, channel 0 | |
| Diagnostic messages | | | | | |
| • Diagnostic information readable | Yes | Yes | No | Yes | |
| Galvanic isolation | | | | | |
| Galvanic isolation analog inputs | | | | | |
| • between the channels | No | No | No | No | |
| • between the channels and the backplane bus | Yes | Yes | Yes | Yes | |
| Isolation | | | | | |
| Isolation checked with | 500 V DC | 500 V DC | 500 V DC | 500 V DC | |
| Connection method | | | | | |
| required front connector | 20-pin | 20-pin | 40-pin | 20-pin | |
| Dimensions | | | | | |
| Width | 40 mm | 40 mm | 40 mm | 40 mm | |
| Height | 125 mm | 125 mm | 125 mm | 125 mm | |
| Depth | 120 mm | 120 mm | 117 mm | 120 mm | |
| Weights | | | | | |
| Weight, approx. | 250 g | 200 g | 250 g | 250 g | |
| Article number | 6ES7331-7PF01-0AB0 SM331, 8AI, RESIST., PT100/200/1000, .. | 6ES7331-7PF11-0AB0 SM331, 8AI, 16BIT, THERMOCOUPLE | 6ES7331-7PE10-0AB0 SM331, 6AI, 16BIT, THERMOCOUPLE | 6ES7331-7NF00-0AB0 SM331,8AI, +/-5/10V,1-5V, +/-20MA,0/4-20MA | 6ES7331-7NF10-0AB0 SM331,8AI, +/-5/10V,1-5V, +/-20MA,0/4-20MA |
| Product type designation | | | | | |
| Supply voltage | | | | | |
| Load voltage L+ | | | | | |
| • Rated value (DC) | 24 V | 24 V | 24 V | 24 V | |
| • Reverse polarity protection | Yes | Yes | Yes | Yes | |
| Input current | | | | | |
| from load voltage L+ (without load), max. | 240 mA | 200 mA | 150 mA | 200 mA | |
| from backplane bus 5 V DC, max. | 100 mA | 100 mA | 100 mA | 130 mA | |
| Power losses | | | | | |
| Power loss, typ. | 4.6 W | 3 W | 2.2 W | 0.6 W | |
| Analog inputs | | | | | |
| Number of analog inputs | 8 | 8 | 6 | 8 | |
| • For resistance measurement | 8 | | | | |
| permissible input voltage for voltage input (destruction limit), max. | 75 V; 35 V continuous, 75 V for max. 1 s (mark to space ratio 1:20) | 75 V; 20 V DC permanent, 75 V DC for max. 1 s (duty factor 1:20) | 35 V; 35 V continuous, 75 V for max. 1 s (mark to space ratio 1:20) | 50 V; Permanent | |
| permissible input current for current input (destruction limit), max. | | | | 32 mA | |
| | | | | 40 mA | |

Technical specifications (continued)

| Article number | 6ES7331-7PF01-0AB0 | 6ES7331-7PF11-0AB0 | 6ES7331-7PE10-0AB0 | 6ES7331-7NF00-0AB0 | 6ES7331-7NF10-0AB0 |
|--|---|---------------------------------|---------------------------------|---|---|
| | SM331, 8AI, RESIST., PT100/200/1000, .. | SM331, 8AI, 16BIT, THERMOCOUPLE | SM331, 6AI, 16BIT, THERMOCOUPLE | SM331, 8AI, +/-5/10V, 1-5V, +/-20MA, 0/4-20MA | SM331, 8AI, +/-5/10V, 1-5V, +/-20MA, 0/4-20MA |
| Input ranges (rated values), voltages | | | | | |
| • 0 to +10 V | No | No | No | No | No |
| • 1 V to 5 V | No | No | No | Yes | Yes |
| • 1 V to 10 V | No | No | No | No | No |
| • -1 V to +1 V | No | No | Yes | No | No |
| • -10 V to +10 V | No | No | No | Yes | Yes |
| • -2.5 V to +2.5 V | No | No | No | No | No |
| • -250 mV to +250 mV | No | No | Yes | No | No |
| • -5 V to +5 V | No | No | No | Yes | Yes |
| • -50 mV to +50 mV | No | No | Yes | No | No |
| • -500 mV to +500 mV | No | No | Yes | No | No |
| • -80 mV to +80 mV | No | No | Yes | No | No |
| Input ranges (rated values), currents | | | | | |
| • 0 to 20 mA | No | No | No | Yes | Yes |
| • -10 mA to +10 mA | No | No | No | No | No |
| • -20 mA to +20 mA | No | No | No | Yes | Yes |
| • -3.2 mA to +3.2 mA | No | No | No | No | No |
| • 4 mA to 20 mA | No | No | No | Yes | Yes |
| Input ranges (rated values), thermoelements | | | | | |
| • Type B | No | Yes | Yes | No | No |
| • Type E | No | Yes | Yes | No | No |
| • Type J | No | Yes | Yes | No | No |
| • Type K | No | Yes | Yes | No | No |
| • Type L | No | Yes | Yes | No | No |
| • Type N | No | Yes | Yes | No | No |
| • Type R | No | Yes | Yes | No | No |
| • Type S | No | Yes | Yes | No | No |
| • Type T | No | Yes | Yes | No | No |
| • Type U | No | Yes | Yes | No | No |
| • Type TXK/TXK(L) to GOST | No | Yes | Yes | No | No |
| • Input resistance (Type TXK/TXK(L) to GOST) | | | 10 MΩ | | |
| Input ranges (rated values), resistance thermometer | | | | | |
| • Cu 10 | Yes | No | No | No | No |
| • Ni 100 | Yes | No | No | No | No |
| • Ni 1000 | Yes | No | No | No | No |
| • LG-Ni 1000 | Yes | No | No | No | No |
| • Ni 120 | Yes | No | No | No | No |
| • Ni 200 | Yes | No | No | No | No |
| • Ni 500 | Yes | No | No | No | No |
| • Pt 100 | Yes | No | No | No | No |
| • Pt 1000 | Yes | No | No | No | No |
| • Pt 200 | Yes | No | No | No | No |
| • Pt 500 | Yes | No | No | No | No |

SIMATIC S7-300 advanced controller

I/O modules

Analog modules

SM 331 analog input modules**Technical specifications (continued)**

| Article number | 6ES7331-7PF01-0AB0 SM331, 8AI, RESIST., PT100/200/1000, .. | 6ES7331-7PF11-0AB0 SM331, 8AI, 16BIT, THERMOCOUPLE | 6ES7331-7PE10-0AB0 SM331, 6AI, 16BIT, THERMOCOUPLE | 6ES7331-7NF00-0AB0 SM331,8AI, +/-5/10V,1-5V, +/-20MA,0/4-20MA | 6ES7331-7NF10-0AB0 SM331,8AI, +/-5/10V,1-5V, +/-20MA,0/4-20MA |
|--|--|---|--|---|---|
| Input ranges (rated values), resistors | | | | | |
| • 0 to 150 ohms | Yes | No | No | No | No |
| • 0 to 300 ohms | Yes | No | No | No | No |
| • 0 to 600 ohms | Yes | No | No | No | No |
| • 0 to 6000 ohms | | No | No | No | No |
| Thermocouple (TC) | | | | | |
| Temperature compensation | | | | | |
| - Parameterizable | | Yes | Yes | | |
| - internal temperature compensation | | Yes | Yes | | |
| - external temperature compensation with compensations socket | | Yes | Yes | | |
| - external temperature compensation with Pt100 | | Yes | Yes | | |
| Characteristic linearization | | | | | |
| • Parameterizable | Yes | Yes | Yes | | |
| - for thermocouples | | Type B, E, J, K, L, N, R, S, T, U, C | Type B, E, J, K, L, N, R, S, T, U, C, TXK, XK(L) | | |
| - for resistance thermometer | Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10; (standard/ climate) | | No | | |
| Cable length | | | | | |
| • shielded, max. | 200 m | 100 m | 200 m | 200 m | 200 m |
| Analog value creation | | | | | |
| Measurement principle | integrating | integrating | integrating | integrating | integrating |
| Integration and conversion time/ resolution per channel | | | | | |
| • Resolution with overrange (bit including sign), max. | 16 bit; Two's complement | 16 bit; Two's complement | 16 bit; Two's complement | 16 bit; Unipolar: 15/15/15/15 bits; bipolar: 15 bits + sign/ 15 bits + sign/ 15 bits + sign/ 15 bits + sign | 16 bit; Unipolar: 15/15/15/15 bits; bipolar: 15 bits + sign/ 15 bits + sign/ 15 bits + sign/ 15 bits + sign |
| • Integration time, parameterizable | Yes | Yes | Yes | Yes; 10/ 16.67/ 20/ 100 ms | Yes; 23 / 72 / 83 / 95 ms |
| • Basic conversion time (ms) | up to 4 channels: 10 ms per module, over 5 channels: 190 ms per module, 8 channels: 80 ms | Up to 4 channels: 10 ms per module, 5 channels upwards: 190 ms per module | 30 / 50 / 60 / 300 | | 10 ms (4-channel mode); 95/83/72/23 ms (8-channel mode) |
| • Integration time (ms) | | | 10 / 16,67 / 20 / 100 | | |
| • Interference voltage suppression for interference frequency f1 in Hz | 400 / 60 / 50 Hz | 400 / 60 / 50 Hz | 10 / 50 / 60 / 400 Hz | 10 / 50 / 60 / 400 Hz | 400 / 60 / 50 Hz, combinations of 400, 60, 50 Hz |
| Encoder | | | | | |
| Connection of signal encoders | | | | | |
| • for current measurement as 2-wire transducer | | | | Yes; with external transmitter; possible with separate supply for transmitter | Yes; with external transmitter, current supply; possible with separate supply for transmitter |
| • for current measurement as 4-wire transducer | | | | Yes | Yes |
| • for resistance measurement with two-wire connection | Yes; without resistance correction | | | | |
| • for resistance measurement with three-wire connection | Yes | | | | |
| • for resistance measurement with four-wire connection | Yes | | | | |

Technical specifications (continued)

| Article number | 6ES7331-7PF01-0AB0 | 6ES7331-7PF11-0AB0 | 6ES7331-7PE10-0AB0 | 6ES7331-7NF00-0AB0 | 6ES7331-7NF10-0AB0 |
|---|---|---------------------------------|--|--|---|
| | SM331, 8AI, RESIST., PT100/200/1000, .. | SM331, 8AI, 16BIT, THERMOCOUPLE | SM331, 6AI, 16BIT, THERMOCOUPLE | SM331, 8AI, +/-5/10V, 1-5V, +/-20MA, 0/4-20MA | SM331, 8AI, +/-5/10V, 1-5V, +/-20MA, 0/4-20MA |
| Errors/accuracies | | | | | |
| Operational limit in overall temperature range | | | | | |
| • Voltage, relative to input area, (+/-) | | +/- 1 K | Operating error at 0 ... 60 °C: ±0.12% @ ±25 mV, ±0.08% @ ±50 mV, ±0.6% @ ±80 mV, ±0.05% @ ±250 mV, ±0.05% @ 500 mV, ±0.05% @ ±1 V | 0.1 %; At Ucm = 0 V or ±0.7 % at Ucm = 50 V | 0.1 % |
| • Current, relative to input area, (+/-) | | | | 0.3 %; At Ucm = 0 V or ±0.9 % at Ucm = 50 V | 0.1 % |
| • Resistance, relative to input area, (+/-) | 0.1 % | | | | |
| • Resistance thermometer, relative to input area, (+/-) | +/- 1 K | | | | |
| Basic error limit (operational limit at 25 °C) | | | | | |
| • Voltage, relative to input area, (+/-) | | | See manual for details | 0.05 % | 0.05 % |
| • Current, relative to input area, (+/-) | | | | 0.05 % | 0.05 % |
| • Resistance, relative to input area, (+/-) | 0.05 % | | | | |
| • Resistance thermometer, relative to input area, (+/-) | +/- 0,5 K | | | | |
| Isochronous mode | | | | | |
| Isochronous operation (application synchronized up to terminal) | No | No | No | No | No |
| Interrupts/diagnostics/status information | | | | | |
| Alarms | | | | | |
| • Diagnostic alarm | Yes; Parameterizable per group | Yes; Parameterizable per group | Yes; channel by channel | Yes; Parameterizable | Yes; Parameterizable |
| • Limit value alarm | Yes; Parameterizable | Yes; Parameterizable | Yes; Parameterizable | Yes; Parameterizable, channels 0 and 2 | Yes; Parameterizable all channels (end of cycle interrupt is also supported across modules) |
| Diagnostic messages | | | | | |
| • Diagnostic information readable | Yes | Yes | Yes | Yes | Yes |
| Galvanic isolation | | | | | |
| Galvanic isolation analog inputs | | | | | |
| • between the channels | No | No | Yes | No | No |
| • between the channels, in groups of 2 | 2 | 2 | 1 | 2 | 2 |
| • between the channels and the backplane bus | Yes | Yes | Yes | Yes | Yes |
| Isolation | | | | | |
| Isolation checked with | 500 V DC | 500 V DC | 2500 V DC | 500 V DC | 500 V AC |
| Connection method | | | | | |
| required front connector | 40-pin | 40-pin | 40-pin | 40-pin | 40-pin |
| Dimensions | | | | | |
| Width | 40 mm | 40 mm | 40 mm | 40 mm | 40 mm |
| Height | 125 mm | 125 mm | 125 mm | 125 mm | 125 mm |
| Depth | 120 mm | 120 mm | 120 mm | 120 mm | 120 mm |
| Weights | | | | | |
| Weight, approx. | 272 g | 272 g | 272 g | 272 g | 272 g |

SIMATIC S7-300 advanced controller

I/O modules

Analog modules

SM 331 analog input modules**Ordering data****Article No.****Article No.****SM 331 analog input modules**Including labeling strips,
bus connector,
measuring range modules

8 inputs, 13-bit resolution

6ES7331-1KF02-0AB0

8 inputs, resolution 9/12/14 bits

6ES7331-7KF02-0AB0

2 inputs, resolution 9/12/14 bits

6ES7331-7KB02-0AB08 inputs, enhanced resolution
16 bits**6ES7331-7NF00-0AB0**8 inputs, enhanced resolution
16 bits, 4-channel mode**6ES7331-7NF10-0AB0**8 inputs, resolution 14 bits,
for isochronous mode**6ES7331-7HF01-0AB0**6 inputs, for thermal elements,
resolution 16 bits**6ES7331-7PE10-0AB0**

8 inputs, for thermal resistors

6ES7331-7PF01-0AB0

8 inputs, for thermoelements

6ES7331-7PF11-0AB0**Measuring range module
for analog inputs**1 module for 2 analog inputs;
2 units (spare part)**6ES7974-0AA00-0AA0****Front connectors**

20-pin, with screw contacts

- 1 unit
- 100 units

6ES7392-1AJ00-0AA0
6ES7392-1AJ00-1AB0

20-pin, with spring-loaded contacts

- 1 unit
- 100 units

6ES7392-1BJ00-0AA0
6ES7392-1BJ00-1AB0

40-pin, with screw contacts

- 1 unit
- 100 units

6ES7392-1AM00-0AA0
6ES7392-1AM00-1AB0

40-pin, with spring-loaded contacts

- 1 unit
- 100 units

6ES7392-1BM01-0AA0
6ES7392-1BM01-1AB0**Front door, elevated design****6ES7328-0AA00-7AA0**e.g. for 32-channel modules;
for connecting
1.3 mm²/16 AWG wires**SIMATIC TOP connect**

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Bus connectors**6ES7390-0AA00-0AA0**

1 unit (spare part)

Shield connecting element**6ES7390-5AA00-0AA0**80 mm wide, with 2 rows
for 4 terminal elements each**Terminal elements**

2 units

For 2 cables with 2 mm to 6 mm
diameter**6ES7390-5AB00-0AA0**For 1 cable with 3 mm to 8 mm
diameter**6ES7390-5BA00-0AA0**For 1 cable with 4 mm to 13 mm
diameter**6ES7390-5CA00-0AA0****Label cover****6ES7392-2XY00-0AA0**10 units (spare part), for modules
with 20-pin front connector**Labeling strips****6ES7392-2XX00-0AA0**10 units (spare part), for modules
with 20-pin front connector**Labeling sheets for machine
labeling**for modules with 20-pin front
connector, DIN A4, for printing with
laser printer; 10 units

petrol

6ES7392-2AX00-0AA0

light-beige

6ES7392-2BX00-0AA0

yellow

6ES7392-2CX00-0AA0

red

6ES7392-2DX00-0AA0for modules with 40-pin front
connector, DIN A4, for printing with
laser printer; 10 units

petrol

6ES7392-2AX10-0AA0

light-beige

6ES7392-2BX10-0AA0

yellow

6ES7392-2CX10-0AA0

red

6ES7392-2DX10-0AA0**SIMATIC Manual Collection****6ES7998-8XC01-8YE0**Electronic manuals on DVD,
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