MANUFACTURER DOCUMENT PACKAGE

# Manufacturer's Manual

Reference package for procurement and maintenance review

SIEMENS

## 6ES7145-5ND00-0BA0

**FOUR-CHANNEL ANALOG OUTPUT MODULE**

Used with the applicable SIMATIC ET 200AL AQ 4xU/I configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Siemens 6ES7145-5ND00-0BA0 original product data, applicable source pages 1, 2, 3.

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## Data sheet 6ES7145-5ND00-0BA0

Siemens EcoTech

SIMATIC ET 200AL, AQ 4xU/I, 4xM12, Degree of protection IP67



Figure similar

| | |
|---|---|
| **General information** | |
| Product type designation | AQ 4xU/I |
| HW functional status | FS06 |
| Firmware version | V2.0.x |
| Product function | |
| ● I&M data | Yes; I&M0 to I&M3 |
| Engineering with | |
| ● STEP 7 TIA Portal configurable/integrated from version | STEP 7 V14 or higher |
| ● STEP 7 configurable/integrated from version | V5.5 SP4 Hotfix 7 or higher |
| ● PROFIBUS from GSD version/GSD revision | GSD as of Revision 5 |
| ● PROFINET from GSD version/GSD revision | GSDML V2.3.1 |
| **Supply voltage** | |
| power supply according to NEC Class 2 required | No |
| Load voltage 1L+ | |
| ● Rated value (DC) | 24 V |
| ● permissible range, lower limit (DC) | 20.4 V |
| ● permissible range, upper limit (DC) | 28.8 V |
| ● Reverse polarity protection | Yes; Against destruction; actuator power supply outputs applied with reversed polarity |
| **Input current** | |
| Current consumption (rated value) | 75 mA; without load |
| from load voltage 1L+ (unswitched voltage) | 4 A; Maximum value |
| from load voltage 2L+, max. | 4 A; Maximum value |
| **Actuator supply** | |
| Number of outputs | 4 |
| Short-circuit protection | Yes; per module, electronic |
| Output current | |
| ● Rated value | Total current 1 A up to 45 °C; 0.5 A up to 55 °C |
| **Power loss** | |
| Power loss, typ. | 2.6 W |
| **Analog outputs** | |
| Number of analog outputs | 4 |
| Voltage output, short-circuit protection | Yes |
| Voltage output, short-circuit current, max. | 24 mA |
| Current output, no-load voltage, max. | 15 V |


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| Cycle time (all channels) max. | 1 ms |
| Output ranges, voltage | |
| ● 0 to 10 V | Yes; 15 bit |
| ● 1 V to 5 V | Yes; 14 bit |
| ● -10 V to +10 V | Yes; 16 bit incl. sign |
| Output ranges, current | |
| ● 0 to 20 mA | Yes; 15 bit |
| ● -20 mA to +20 mA | Yes; 16 bit incl. sign |
| ● 4 mA to 20 mA | Yes; 14 bit |
| Connection of actuators | |
| ● for voltage output two-wire connection | Yes |
| ● for voltage output four-wire connection | Yes |
| ● for current output two-wire connection | Yes |
| ● for current output four-wire connection | Yes |
| Load impedance (in rated range of output) | |
| ● with voltage outputs, min. | 1 kΩ |
| ● with voltage outputs, capacitive load, max. | 1 µF |
| ● with current outputs, max. | 500 Ω |
| ● with current outputs, inductive load, max. | 1 mH |
| Destruction limits against externally applied voltages and currents | |
| ● Voltages at the outputs towards MANA | 16 V |
| Cable length | |
| ● shielded, max. | 30 m |
| **Analog value generation for the outputs** | |
| Integration and conversion time/resolution per channel | |
| ● Resolution with overrange (bit including sign), max. | 16 bit |
| Settling time | |
| ● for resistive load | 1 ms |
| ● for capacitive load | 1 ms |
| ● for inductive load | 1 ms |
| **Errors/accuracies** | |
| Output ripple (relative to output range, bandwidth 0 to 50 kHz), (+/-) | 0.02 % |
| Linearity error (relative to output range), (+/-) | 0.1 % |
| Temperature error (relative to output range), (+/-) | 0.005 %/K |
| Crosstalk between the outputs, max. | -70 dB |
| Repeat accuracy in steady state at 25 °C (relative to output range), (+/-) | 0.03 % |
| Operational error limit in overall temperature range | |
| ● Voltage, relative to output range, (+/-) | 0.25 % from 55 °C to -25 °C and 0.35 % to -30 °C |
| ● Current, relative to output range, (+/-) | 0.25 % |
| Basic error limit (operational limit at 25 °C) | |
| ● Voltage, relative to output range, (+/-) | 0.15 % |
| ● Current, relative to output range, (+/-) | 0.15 % |
| **Interrupts/diagnostics/status information** | |
| Substitute values connectable | Yes; channel by channel, parameterizable |
| Alarms | |
| ● Diagnostic alarm | Yes; Parameterizable |
| Diagnoses | |
| ● Wire break | Yes; channel-by-channel, only for output type "current" |
| ● Short-circuit | Yes; Actuator supply module by module; channel by channel for output type "voltage" |
| Diagnostics indication LED | |
| ● Channel status display | Yes; green LED |
| ● for module diagnostics | Yes; green/red LED |
| **Potential separation** | |
| between the load voltages | Yes |
| Potential separation channels | |
| ● between the channels | No |
| ● between the channels and backplane bus | Yes |


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| | |
|---|---|
| ● between the channels and the power supply of the electronics | No |
| **Isolation** | |
| Isolation tested with | 707 V DC (type test) |
| **Degree and class of protection** | |
| IP degree of protection | IP65/67 |
| **Standards, approvals, certificates** | |
| Suitable for safety-related tripping of standard modules | Yes; From FS03 |
| Highest safety class achievable for safety-related tripping of standard modules | |
| ● Performance level according to ISO 13849-1 | PL d |
| ● Category according to ISO 13849-1 | Cat. 3 |
| ● SIL acc. to IEC 62061 | SIL 2 |
| ● remark on safety-oriented shutdown | https://support.industry.siemens.com/cs/de/en/view/39198632 |
| **Security** | |
| signed firmware update | Yes |
| data integrity | Yes |
| **Ambient conditions** | |
| Ambient temperature during operation | |
| ● min. | -30 °C |
| ● max. | 55 °C |
| Altitude during operation relating to sea level | |
| ● Ambient air temperature-barometric pressure-altitude | Up to max. 5 000 m, at installation height > 2 000 m additional restrictions |
| **Connection method** | |
| Design of electrical connection for the inputs and outputs | M12, 5-pole |
| Design of electrical connection for supply voltage | M8, 4-pole |
| ET-Connection | |
| ● ET-Connection | M8, 4-pin, shielded |
| **Dimensions** | |
| Width | 30 mm |
| Height | 159 mm |
| Depth | 40 mm |
| **Weights** | |
| Weight, approx. | 175 g |

**Classifications**

| | Version | Classification |
|---|---|---|
| eClass | 14 | 27-24-26-01 |
| eClass | 12 | 27-24-26-01 |
| eClass | 9.1 | 27-24-26-01 |
| eClass | 9 | 27-24-26-01 |
| eClass | 8 | 27-24-26-01 |
| eClass | 7.1 | 27-24-26-01 |
| eClass | 6 | 27-24-26-01 |
| ETIM | 10 | EC001596 |
| ETIM | 9 | EC001596 |
| ETIM | 8 | EC001596 |
| ETIM | 7 | EC001596 |
| IDEA | 4 | 3562 |
| UNSPSC | 15 | 32-15-17-05 |

**Approvals / Certificates**

| General Product Approval | EMV |
|---|---|


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