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## Data sheet 6AG2136-6PA00-1BC0



SIPLUS ET 200SP F-PM-E 24VDC/8A PPM rail based on 6ES7136-6PA00-0BC0 with conformal coating, -30…+60 °C, OT1 with ST1/2 (+70 °C für 10 minutes), fail-safe power module PROFIsafe, 24 V DC safe shutdown of DQ and F-DQ up to PL D/SIL2 or PL E/SIL3 2 safe digital inputs 1 safe digital output PPM

| | |
|---|---|
| **General information** | |
| Product type designation | F-PM-E PPM 24VDC |
| based on | 6ES7136-6PA00-0BC0 |
| usable BaseUnits | BU type C0 |
| Color code for module-specific color-coded label | CC52 |
| Product function | |
| ● I&M data | Yes; I&M0 to I&M3 |
| Engineering with | |
| ● STEP 7 TIA Portal configurable/integrated from version | see entry ID: 109746275 |
| **Supply voltage** | |
| 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 |
| **Input current** | |
| Current consumption (rated value) | 75 mA; without load |
| Current consumption, max. | 21 mA; From the backplane bus |
| **Output voltage** | |
| Rated value (DC) | 24 V |
| **Encoder supply** | |
| Number of outputs | 2 |
| Short-circuit protection | Yes; Electronic (response threshold 0.7 A to 2.1 A) |
| Output current | |
| ● up to 60 °C, max. | 0.3 A |
| 24 V encoder supply | |
| ● 24 V | Yes; min. L+ (-1.5 V) |
| ● Short-circuit protection | Yes |
| ● Output current, max. | 600 mA; Total current of all encoders |
| **Power** | |
| Power consumption from the backplane bus | 70 mW |
| **Power loss** | |
| Power loss, typ. | 5 W |
| **Address area** | |
| Address space per module | |
| ● Inputs | 7 byte |
| ● Outputs | 5 byte |
| **Hardware configuration** | |
| Automatic encoding | Yes |
| ● Electronic coding element type F | Yes |


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| **Digital inputs** | |
| Number of digital inputs | 2 |
| Sourcing/sinking input | Yes; P-reading |
| Input characteristic curve in accordance with IEC 61131, type 1 | Yes |
| Input voltage | |
| ● Type of input voltage | DC |
| ● Rated value (DC) | 24 V |
| ● for signal "0" | -30 to +5 V |
| ● for signal "1" | +15 to +30 V |
| Input current | |
| ● for signal "1", typ. | 3.7 mA |
| Input delay (for rated value of input voltage) | |
| for standard inputs | |
| — parameterizable | Yes |
| — at "0" to "1", min. | 0.4 ms |
| — at "0" to "1", max. | 20 ms |
| — at "1" to "0", min. | 0.4 ms |
| — at "1" to "0", max. | 20 ms |
| for technological functions | |
| — parameterizable | No |
| Cable length | |
| ● shielded, max. | 1 000 m |
| ● unshielded, max. | 500 m |
| **Digital outputs** | |
| Number of digital outputs | 1 |
| Digital outputs, parameterizable | Yes |
| Short-circuit protection | Yes |
| ● Response threshold, typ. | > 14.8 A |
| Open-circuit detection | Yes |
| ● Response threshold, typ. | 8 mA |
| Overload protection | Yes |
| ● Response threshold, typ. | 8.8 A |
| Limitation of inductive shutdown voltage to | max. 1.5 V |
| Switching capacity of the outputs | |
| ● with resistive load, max. | 8 A |
| ● on lamp load, max. | 100 W |
| Load resistance range | |
| ● lower limit | 3 Ω |
| ● upper limit | 2 000 Ω |
| Output voltage | |
| ● for signal "1", min. | 24 V; L+ (-0.5 V) |
| Output current | |
| ● for signal "1" rated value | 8 A |
| ● for signal "0" residual current, max. | 1.5 mA; PP-switching: max. 1.5 mA; PM-switching: max. 1 mA |
| Switching frequency | |
| ● with resistive load, max. | 10 Hz; Symmetrical |
| ● with inductive load, max. | 0.1 Hz; according to IEC 60947-5-1, DC-13, symmetrical |
| ● on lamp load, max. | 4 Hz; Symmetrical |
| Total current of the outputs | |
| ● Current per channel, max. | 8 A; note derating data in the manual |
| ● Current per module, max. | 8 A; note derating data in the manual |
| Total current of the outputs (per module) | |
| horizontal installation | |
| — up to 40 °C, max. | 8 A; note derating data in the manual |
| — up to 50 °C, max. | 6 A; note derating data in the manual |
| — up to 60 °C, max. | 4 A; note derating data in the manual |
| — up to 70 °C, max. | 4 A; note derating information in the manual; only with configured slots to the left and right of the module |
| Cable length | |


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| ● shielded, max. | 1 000 m |
| ● unshielded, max. | 500 m |
| **Interrupts/diagnostics/status information** | |
| Diagnostics function | Yes; See Chapter "Alarms/diagnostic messages" in the manual |
| Substitute values connectable | No |
| Alarms | |
| ● Diagnostic alarm | Yes |
| ● Hardware interrupt | No |
| Diagnostics indication LED | |
| ● RUN LED | Yes; green LED |
| ● ERROR LED | Yes; red LED |
| ● Monitoring of the supply voltage (PWR-LED) | Yes; green PWR LED |
| ● Channel status display | Yes; green LED |
| ● for channel diagnostics | Yes; red LED |
| ● for module diagnostics | Yes; green/red DIAG LED |
| **Potential separation** | |
| Potential separation channels | |
| ● between the channels | No |
| ● between the channels and backplane bus | Yes |
| ● between the channels and the power supply of the electronics | No |
| **Isolation** | |
| Isolation tested with | 750 V DC (type test) and according to EN 50155 (routine test) |
| **Standards, approvals, certificates** | |
| Suitable for safety functions | Yes |
| Ecological footprint | |
| ● environmental product declaration | Yes |
| Global warming potential | |
| — global warming potential, (total) [CO2 eq] | 88.3 kg |
| — global warming potential, (during production) [CO2 eq] | 13.1 kg |
| — global warming potential, (during operation) [CO2 eq] | 76.6 kg |
| — global warming potential, (after end of life cycle) [CO2 eq] | -1.37 kg |
| Highest safety class achievable in safety mode | |
| ● Performance level according to ISO 13849-1 | PLe |
| ● SIL acc. to IEC 61508 | SIL 3 |
| ● SIL in accordance with EN 50126-1, 50129, 50159, 50716 | SIL 2; a higher safety integrity level is possible if tested and approved for the specific application under consideration of all local regulations. |
| Probability of failure (for service life of 20 years and repair time of 100 hours) | |
| — Low demand mode: PFDavg in accordance with SIL2 | < 2.00E-04 |
| — Low demand mode: PFDavg in accordance with SIL3 | < 2.00E-05 |
| — High demand/continuous mode: PFH in accordance with SIL2 | < 1.00E-08 1/h |
| — High demand/continuous mode: PFH in accordance with SIL3 | < 1.00E-09 1/h |
| Railway application | |
| ● EN 50121-3-2 | Yes; EMC for rail vehicles |
| ● EN 50121-4 | Yes; EMC for signal and telecommunications systems |
| ● EN 50121-5 | Yes; EMC for fixed installations and railway power supply equipment (shielded cables required) |
| ● EN 50124-1 | Yes; Railway applications - overvoltage category OV2; pollution degree PD2; rated surge voltage UNi = 0.5 kV; UNm = 24 V DC |
| ● EN 50125-1 | Yes; Rail vehicles - see ambient conditions |
| ● EN 50125-2 | Yes; Stationary electrical equipment - see ambient conditions |
| ● EN 50125-3 | Yes; Signal and telecommunications systems - see ambient conditions; vibrations and shocks: Application point outside of tracks (1 m to 3 m away from track) |
| ● EN 50155 | Yes; Rail vehicles - temperature class OT1, ST1/ST2, horizontal mounting position |


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| ● EN 61373 | Yes; Rail vehicles - vibrations and shocks: Category 1 Class A/B |
| ● Fire protection acc. to EN 45545-2 | Yes; For proof of conformity, see Service & Support |
| **Ambient conditions** | |
| Ambient temperature during operation | |
| ● horizontal installation, min. | -30 °C; = Tmin (incl. condensation/frost) |
| ● horizontal installation, max. | 60 °C; = Tmax; +70 °C for 10 min (OT1, ST1/ST2 acc. to EN 50155); +70 °C continuously with spacing modules (6AG2193-6BN00-4BA0) or configured empty slots to the left and right of the module (OT3, ST1/ST2 acc. to EN 50155) |
| ● vertical installation, min. | -30 °C; = Tmin |
| ● vertical installation, max. | 50 °C; = Tmax |
| Altitude during operation relating to sea level | |
| ● Installation altitude above sea level, max. | 2 000 m |
| ● Ambient air temperature-barometric pressure-altitude | Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) |
| Relative humidity | |
| ● With condensation, tested in accordance with IEC 60068-2-38, max. | 100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation |
| Resistance | |
| Coolants and lubricants | |
| — Resistant to commercially available coolants and lubricants | Yes; Incl. diesel and oil droplets in the air |
| 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, * |
| — Against mechanical environmental conditions acc. to EN 60721-3-3 | Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0) |
| Use on land craft, rail vehicles and special-purpose vehicles | |
| — to biologically active substances according to EN 60721-3-5 | Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request |
| — to chemically active substances according to EN 60721-3-5 | Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * |
| — to mechanically active substances according to EN 60721-3-5 | Yes; Class 5S3 incl. sand, dust; * |
| — Against mechanical environmental conditions acc. to EN 60721-3-5 | Yes; Class 5M2 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0) |
| — against mechanical environmental conditions in agriculture acc. to ISO 15003 | Yes; level 1 (Location LE) using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0) |
| 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! |
| Conformal coating | |
| ● Coatings for printed circuit board assemblies acc. to EN 61086 | Yes; Class 2 for high reliability |
| ● Protection against fouling acc. to EN 60664-3 | Yes; Type 1 protection |
| ● Electronic equipment on rolling stock acc. to EN 50155 | Yes; Class PC2 protective coating acc. to EN 50155:2017 |
| ● Military testing according to MIL-I-46058C, Amendment 7 | Yes; Discoloration of coating possible during service life |
| ● Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A | Yes; Conformal coating, Class A |
| **Dimensions** | |
| Width | 20 mm |
| Height | 72 mm |
| Depth | 55 mm |
| **Weights** | |


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| Weight, approx. | 70 g |

**Other**

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| Note: | for use in railway applications, also observe the product information "SIPLUS extreme RAIL" A5E37661960A, Online Support article 109736776 |

**Classifications**

| | Version | Classification |
|---|---|---|
| eClass | 16 | 27-24-26-11 |
| eClass | 14 | 27-24-26-11 |
| eClass | 12 | 27-24-26-11 |
| eClass | 9.1 | 27-24-26-11 |
| eClass | 9 | 27-24-26-11 |
| eClass | 8 | 27-24-26-11 |
| eClass | 7.1 | 27-24-26-11 |
| eClass | 6 | 27-24-26-11 |
| ETIM | 10 | EC002583 |
| ETIM | 9 | EC002583 |
| ETIM | 8 | EC002583 |
| ETIM | 7 | EC002583 |
| IDEA | 4 | 3575 |
| UNSPSC | 15 | 32-15-17-06 |

**Approvals / Certificates**

**General Product Approval**

Manufacturer Declaration

**General Product Approval** | **EMV** | **Functional Saftey**

China RoHS

TUEV | TUEV

**Railway** | **Environment**

Confirmation

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