



Figure similar

SIPLUS ET 200SP F-DI 4/8x24 V DC rail based on 6ES7136-6BA01-0CA0 with conformal coating, -40...+60 °C, OT2 with ST1/2 (+70 °C for 10 minutes), fail-safe digital inputs up to PL e (ISO 13849-1), SIL3 (IEC 61508)

General information	
Product type designation	F-DI 8x24VDC HF
Firmware version	
• FW update possible	Yes
based on	<a href="#">6ES7136-6BA01-0CA0</a>
usable BaseUnits	BU type A0
Color code for module-specific color identification plate	CC01
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
Operating mode	
• DI	Yes
CiR - Configuration in RUN	
Reparameterization possible in RUN	No
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
power supply according to NEC Class 2 required	No
Input current	
Current consumption, max.	40 mA; without load
Encoder supply	
Number of outputs	8
Short-circuit protection	Yes; Electronic (response threshold 0.7 A to 1.8 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; Electronic (response threshold 0.7 A to 1.8 A)
• Output current per channel, max.	300 mA
• Output current per module, max.	800 mA; Total current of all encoders
Power loss	
Power loss, typ.	2 W
Address area	
Address space per module	
• Inputs	7 byte; S7-300/400F CPU, 6 byte

• Outputs	5 byte; S7-300/400F CPU, 4 byte
<b>Hardware configuration</b>	
Automatic encoding	Yes
• Electronic coding element type F	Yes
<b>Digital inputs</b>	
Number of digital inputs	8
Digital inputs, parameterizable	Yes
Source/sink input	Yes; P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5 V
• for signal "1"	+15 to +30 V
<b>Input current</b>	
• for signal "1", typ.	3.7 mA
<b>Input delay (for rated value of input voltage)</b>	
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
<b>Cable length</b>	
• shielded, max.	1 000 m
• unshielded, max.	500 m
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes; See Chapter "Alarms/diagnostic messages" in the manual
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Hardware interrupt	No
<b>Diagnostics indication LED</b>	
• 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
<b>Potential separation</b>	
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
<b>Isolation</b>	
Isolation tested with	750 V DC (type test) and according to EN 50155 (routine test)
<b>Standards, approvals, certificates</b>	
Suitable for safety functions	Yes
<b>Ecological footprint</b>	
• environmental product declaration	Yes
<b>Global warming potential</b>	
— global warming potential, (total) [CO2 eq]	52 kg
— global warming potential, (during production) [CO2 eq]	6.8 kg
— global warming potential, (during operation) [CO2 eq]	45.8 kg
— global warming potential, (after end of life cycle) [CO2 eq]	-0.628 kg
Highest safety class achievable in safety mode	

<ul style="list-style-type: none"> <li>• Performance level according to ISO 13849-1</li> <li>• Category according to ISO 13849-1</li> <li>• SIL acc. to IEC 61508</li> <li>• SIL in accordance with EN 50126, 50128, 50129</li> </ul>	<p>PLe</p> <p>Cat. 4</p> <p>SIL 3</p> <p>SIL 2; a higher safety integrity level is possible if tested and approved for the specific application under consideration of all local regulations.</p>
<b>Probability of failure (for service life of 20 years and repair time of 100 hours)</b>	
— Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
— High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09 1/h
<b>Railway application</b>	
<ul style="list-style-type: none"> <li>• EN 50121-3-2</li> <li>• EN 50121-4</li> <li>• EN 50121-5</li> <li>• EN 50124-1</li> <li>• EN 50125-1</li> <li>• EN 50125-2</li> <li>• EN 50125-3</li> <li>• EN 50155</li> <li>• EN 61373</li> <li>• Fire protection acc. to EN 45545-2</li> </ul>	<p>Yes; EMC for rail vehicles</p> <p>Yes; EMC for signal and telecommunications systems</p> <p>Yes; EMC for fixed installations and railway power supply equipment (shielded cables required)</p> <p>Yes; Railway applications - overvoltage category OV2; pollution degree PD2; rated surge voltage UNi = 0.5 kV; UNm = 24 V DC</p> <p>Yes; Rail vehicles - see ambient conditions</p> <p>Yes; Stationary electrical equipment - see ambient conditions</p> <p>Yes; Signal and telecommunications systems - see ambient conditions; vibrations and shocks: Application point outside of tracks (1 m to 3 m away from track)</p> <p>Yes; Rail vehicles - temperature class OT2, ST1/ST2, horizontal mounting position</p> <p>Yes; Rail vehicles - vibrations and shocks: Category 1 Class A/B</p> <p>Yes; For proof of conformity, see Service &amp; Support</p>
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
<ul style="list-style-type: none"> <li>• horizontal installation, min.</li> <li>• horizontal installation, max.</li> <li>• vertical installation, min.</li> <li>• vertical installation, max.</li> </ul>	<p>-40 °C; = Tmin (incl. condensation/frost)</p> <p>60 °C; = Tmax; +70 °C for 10 min (OT2, ST1/ST2 acc. to EN 50155); +70 °C continuously with spacing modules (6AG2193-6BN00-4BA0) or configured slots to the left and right of the module (OT4, ST1/ST2 acc. to EN 50155)</p> <p>-40 °C; = Tmin</p> <p>50 °C; = Tmax</p>
<b>Altitude during operation relating to sea level</b>	
<ul style="list-style-type: none"> <li>• Installation altitude above sea level, max.</li> <li>• Ambient air temperature-barometric pressure-altitude</li> </ul>	<p>2 000 m</p> <p>Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)</p>
<b>Relative humidity</b>	
<ul style="list-style-type: none"> <li>• With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>	
<b>Coolants and lubricants</b>	
— Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>	
— 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)
<b>Use on land craft, rail vehicles and special-purpose vehicles</b>	
— 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)
<b>Usage in industrial process technology</b>	

— Against chemically active substances acc. to EN 60654-4  
 — Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04

Yes; Class 3 (excluding trichlorethylene)  
 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
- Protection against fouling acc. to EN 60664-3
- Electronic equipment on rolling stock acc. to EN 50155
- Military testing according to MIL-I-46058C, Amendment 7
- Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A

Yes; Class 2 for high reliability  
 Yes; Type 1 protection  
 Yes; Class PC2 protective coating acc. to EN 50155:2017  
 Yes; Discoloration of coating possible during service life  
 Yes; Conformal coating, Class A

**Dimensions**

Width	15 mm
Height	73 mm
Depth	58 mm

**Weights**

Weight, approx.	29 g
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**Other**

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

**Classifications**

	Version	Classification
eClass	14	27-24-26-04
eClass	12	27-24-26-04
eClass	9.1	27-24-26-04
eClass	9	27-24-26-04
eClass	8	27-24-26-04
eClass	7.1	27-24-26-04
eClass	6	27-24-26-04
ETIM	10	EC001599
ETIM	9	EC001599
ETIM	8	EC001599
ETIM	7	EC001599
IDEA	4	3566
UNSPSC	15	32-15-17-05

**Approvals / Certificates**

<b>General Product Approval</b>	<b>EMV</b>	<b>Functional Safety</b>
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[Manufacturer Declaration](#)



[China RoHS](#)



[TUEV](#)

<b>Railway</b>	<b>Environment</b>
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[Confirmation](#)



last modified:

10/23/2025

