## **SIEMENS**

## **Data sheet**

## 6AG1551-1AB00-7AB0

SIPLUS S7-1500 TM Posinput 2 based on 6ES7551-1AB00-0AB0 with conformal coating, -25...+70 °C, counting and position feedback module, 2 channels, for RS-422 incremental encoder or SSI absolute encoder, 2 DI, 2 DQ per channel

General information	422 incremental encoder of SSI absolute encoder, 2 DI, 2 DQ per channel	
Product type designation	TM PosInput 2	
Product function		
● I&M data	Yes; I&M 0	
Isochronous mode	Yes	
Engineering with		
STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275	
Installation type/mounting	300 chily 15. 100140210	
Rail mounting	Yes; S7-1500 mounting rail	
Supply voltage	res, 37-1300 mounting rail	
Load voltage L+		
9	24.1/	
Rated value (DC)  Transpiration for the property of the p	24 V	
• permissible range, lower limit (DC)	19.2 V	
permissible range, upper limit (DC)	28.8 V	
Reverse polarity protection	Yes	
Input current		
Current consumption, max.	75 mA; without load	
Encoder supply		
Number of outputs	4; One 5V and 24V encoder supply per channel	
5 V encoder supply		
• 5 V	Yes; 5.2 V ±2 %	
Short-circuit protection	Yes	
Output current, max.	300 mA; Per channel	
24 V encoder supply		
• 24 V	Yes; L+ (-0.8 V)	
<ul> <li>Short-circuit protection</li> </ul>	Yes	
<ul> <li>Output current, max.</li> </ul>	300 mA; Per channel	
Power		
Power consumption from the backplane bus	1.3 W	
Power loss		
Power loss, typ.	5.5 W	
Address area		
Address space per module		
• Inputs	16 byte; Per channel	
<ul> <li>Outputs</li> </ul>	12 byte; per channel; 4 bytes for Motion Control	
Digital inputs		
Number of digital inputs	4; 2 per channel	
Digital inputs, parameterizable	Yes	
Input characteristic curve in accordance with IEC 61131, type 3	Yes	
Digital input functions, parameterizable		
Gate start/stop	Yes; only for pulse and incremental encoders	
• Capture	Yes	
Synchronization	Yes; only for pulse and incremental encoders	
Freely usable digital input	Yes	
Input voltage		
Type of input voltage	DC	
Rated value (DC)	24 V	
• for signal "0"	-30 to +5 V	
• for signal "1"	+11 to +30V	
<ul> <li>permissible voltage at input, min.</li> </ul>	-30 V	
■ permissible voltage at imput, min.	-00 V	

Pytermisone Vollage at Typh, Tibb.	• normissible voltage at input may	30 V
For signal 11 typ.   2.5 mA	permissible voltage at input, max.  Input current	30 V
Input delay (for rated value of input vottage)	·	2.5 mA
For standard Inputs		2.5 IIIA
Test-included and incidence of test-included and incidence of test-included and incidence of test-included and incidence of test-incidence		
For technological functions	•	Vas: none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- parameterizable  Cable length  • sheleded, max.		1 es, 11011e / 0.03 / 0.1 / 0.4 / 0.6 / 1.0 / 3.2 / 12.6 / 20 IIIS
Cable length  • shelded, max. • unshielded, max. • unshielded, max.  • unshielded, max.  • unshielded, max.    1 000 m    1	-	Vac
shielded, max. 600 m    Digital outputs		165
■ unshielded, max.  Digital outputs Type of digital outputs  Number of digital outputs  \$4,2 per channel Digital outputs, parameterizable  Yes Short-circuit protection  • Response threshold, typ.  Limitation of inductive shutdown voltage to Controlling a digital input  Digital output functions, parameterizable  • Switching priped by comparison values  • Freely usable digital output  • Switching priped by comparison values  • With resistive load, max.  • on lamp load, max.  • on lamp load, max.  • (Lover limit)  • (Lover limit	•	1 000 m
Type of digital outputs  Type of digital outputs  As a per digital outputs  Digital outputs, parameterizable  Pess Short-circult protection  Response threshold, typ.  1 A  Limitation of inductive shutdown voltage to  Controlling a digital input  Pes  Bytes in the output functions, parameterizable  Switching tripped by comparison values  Freely usable digital output  Pes  Switching ripped by comparison values  With resistive load, max.  O. 5 A; Per digital output  With resistive load, max.  O. 5 A; Per digital output  Switching capacity of the outputs  With resistive load, max.  Output voltage  Freely usable digital output  Output voltage  Freely output voltage  Output voltage  Freely output voltage  Freely output voltage  Output user  Output urerent  For signal "1" rated value  For signal "1" rated valu		
Type of digital output  Number of digital outputs  4: 2 per channel  Digital outputs, parameterizable  Yes  Short-circuit protection  • Response threshold, typ.  Limitation of inductive shutdown voltage to  Controlling a digital input  Digital output functions, parameterizable  • Switching fixped by comparison values  • Freely usable digital output  Switching capacity of the outputs  • with resistive load, max.  • on lamp load, max.  • lover limit  • Laca resistance range  • lover limit  • upper limit  Output voltage  • Type of out	·	000 111
Number of digital outputs Digital outputs, parameterizable Ves Short-dirout protection Response threshold, lyp. 1 A Limitation of inductive shutdown voltage to Controlling a digital input Ves Digital output functions, parameterizable Switching tipped by comparison values Freely usable digital output Ves Switching tipped by comparison values Freely usable digital output Ves Switching capacity of the outputs With resistive load, max. Os 5 A: Per digital output Ves Switching capacity of the outputs With resistive load, max. Os 5 A: Per digital output Ves Switching capacity of the outputs Ves Ves Ves Ves Ves Ves Ves Ves Ves Ve		Transistar
Digital outputs, parameterizable  Short-circuit protection  Response threshold, typ.  Limitation of inductive shutdown voltage to  Chrorolling a digital input  Switching tripped by comparison values  Freely usable digital output  with resistive load, max.  on lamp load, max.  on lamp load, max.  lower limit  for signal "1" rated value  for signal "1" minimum load current  for signal "0" residual current, max.  Output delay with resistive load  "0" to "1", max.  \$50 µs  "1" to "0", max.  \$50 µs  "1" to "0", max.  \$50 µs  "1" to "0", max.  \$10 kHz  with inductive load, max.  on lamp load, max.  10 kHz  ounshielded, max.  on lamp load, max.  10 kHz  shielded, max.  10 kHz  shielded, max.  on lamp load, max.  10 kHz  shielded, max.  4 MHz; with quadruple evaluation		
Short-circuit protection  Response threshold, typ. Limitation of inductive shutdown voltage to Le (-33 V) Controlling a digital input Yes  Digital output functions, parameterizable Switching tripped by comparison values Freely usable digital output Yes Switching tripped by comparison values With resistive load, max. O. 5 A; Per digital output Output voltage I vaper limit Ves Switching capacity of the outputs  Ves Switching reduced to the outputs  Ves Switching referency  Ves  Ves Switching referency  Ves Ves Switching referency  Ves Ves Switching referency  Ves Ves Switching referency  Ves Ves Switching referency  Ves Ves Switching referency  Ves Ves Switching referency  Ves Ves Switching referency  Ves Ves Switching referency  Ves Ves Switching referency  Ves Ves Switching referency  Ves Ves Switching referency  Ves Ves Switching referency  Ves Ves Switching referency  Ves Ves Ves Switching referency  Ves Ves Ves Switching referency  Ves Ves Ves Ves Ves Ves Ves Ves Ves Ve	·	·
Response threshold, typ.  Limitation of inductive shutdown voltage to Chorfolling a digital input Yes  Digital output functions, parameterizable Switching tripped by comparison values Freely usable digital output Yes Switching capacity of the outputs  with resistive load, max. on lamp load, max. ols A; Per digital output Suttended the comparison of the outputs  lower limit I de Q I over limit I de Q I de Q I over limit I de Q I de	•	
Limitation of inductive shutdown voltage to Controlling a digital input Pes Digital output functions, parameterizable  • Switching tripped by comparison values • Freely usable digital output Switching capacity of the outputs • with resistive load, max. • on lamp load, max.  • lower limit • upper limit • upper limit • upper limit • for signal "1", min.  Output current • for signal "1" rated value • for signal "1" permissible range, max. • for signal "1" permissible range, max. • on signal "1" permissible range, max. • for signal "0" residual current, max.  Output delay with resistive load • "0" to "1", max. • "1" to "0", max. • "1" t	·	
Controlling a digital input Digital output functions, parameterizable Switching tripped by comparison values Freely usable digital output Ves Switching capacity of the outputs  with resistive load, max. o. 5. A; Per digital output Switching capacity of the outputs with resistive load, max. on lamp load, max. 5 W  Load resistance range lower limit AB Q Output voltage Type of output voltage For signal "1" min. Casa 2 V; L+ (-0.8 V)  Output current for signal "1" reted value For signal "1" resistive load For signal "1" minimum load current For signal "1" minimum load current For signal "0" residual current, max. O.5 A; Per digital output For signal "0" residual current, max. O.5 mA  Output delay with resistive load C" "0" to "1", max. So µs Switching frequency With resistive load, max. With inductive load, max. O.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve On lamp load, max. OLD max. Switching frequency Switching frequency With resistive load, max. O.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve Output current per module, max. O.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve Output delay max. OLD Hz  Total current of the outputs Current per module, max. O.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve Output per module, max. OLD Hz  Total current of the outputs Current per module, max. OLD Hz  Total current of the outputs Current per module, max. OLD Hz  Total current of the outputs OUTPUT per module, max. OLD Hz  Total current of the outputs OUTPUT per module, max. OLD Hz  Total current of the outputs OUTPUT per module, max. OLD Hz  Total current of the outputs OUTPUT per module, max. OLD Hz  Total current of the outputs OUTPUT per module, max. OUTPUT per	·	
Digital output functions, parameterizable  Switching tripped by comparison values  Freely usable digital output  with resistive load, max.  on lamp load, max.  on lamp load, max.  Output voltage  Type of output voltage  of ro signal "1", min.  Output voltage  for signal "1" rated value  of ro signal "1" rated value  of ro signal "1" permissible range, max.  of signal "1" resistive load current, max.  Output delay with resistive load  "0" to "1", max.  of signal "0" residual current, max.  Output delay with resistive load  "0" to "1", max.  of signal "1" ro "0", max.  sol ps  "1" to "0", max.  of signal "1" ro "	·	
■ Switching tripped by comparison values ■ Freely usable digital output  ■ With resistive load, max. ■ on lamp load, max. ■ on lamp load, max. ■ O.5 A; Per digital output  ■ With resistive load, max. ■ O.5 W  Load resistance range ■ lower limit ■ upper limit ■ 12 kΩ  Output voltage ■ Type of output voltage ■ for signal "1", min. ■ 23.2 V; L+ (-0.8 V)  Output current ■ or signal "1" rated value ■ or signal "1" rated value ■ or signal "1" remissible range, max. ■ of signal "1" remissible range, max. ■ of signal "1" residual current ■ or signal "1" residual current, max. ■ of signal "0" residual current, max.  Output delay with resistive load ■ "0" to "1", max. ■ 50 μs ■ "1" to "0", max.  Switching frequency ■ with resistive load, max. ■ on lamp load, max. ■ on lamp load, max. ■ Other on the outputs ■ Current per module, max. ■ Cable length ■ shielded, max. ■ unshielded, max. ■ unshielded, max. ■ unshielded, max. ■ loud requency, max.  I MHz ■ Counting frequency, max.  4 MHz; with quadruple evaluation		Yes
Freely usable digital output  With resistive load, max.  on lamp load, max.  10 MHz  output voltage  Type of output voltage  of risignal "1" rated value of risignal "1" rated value of risignal "1" riminimum load current of risignal "1" riminimum load current of risignal "1" riminimum load current of risignal "0" residual current, max.  of risignal "0" residual current, max.  Output delay with resistive load  o" 0" to "1", max.  o" to "1", max.  o" to "1", max.  o" to "1" to "0", max.  Switching frequency  with inductive load, max. on lamp load, max. on lam		V
■ with resistive load, max.  ■ on lamp load, max.  ■ outper limit  ■ 48 Ω  ■ upper limit  ■ 12 kΩ   Output voltage  ■ Type of output voltage  ■ or signal "1", min.  Output current  ■ of or signal "1" rated value  ■ of or signal "1" rated value  ■ of or signal "1" remissible range, max.  ■ of or signal "1" minimum load current  ■ of or signal "1" residual current, max.  ■ of or signal "1" residual current, max.  ■ o.5 mA  Output delay with resistive load  ■ "0" to "1", max.  ■ o.5 μs  ■ '1" to "0", max.  Switching frequency  ■ with resistive load, max.  ■ o.1 kHz  ■ with inductive load, max.  ■ on lamp load		
<ul> <li>with resistive load, max.</li> <li>on lamp load, max.</li> <li>5 W</li> <li>Load resistance range</li> <li>lower limit</li> <li>upper limit</li> <li>12 kΩ</li> <li>Output voltage</li> <li>for signal "1", min.</li> <li>23.2 V; L+ (-0.8 V)</li> <li>Output current</li> <li>for signal "1" permissible range, max.</li> <li>for signal "1" permissible range, max.</li> <li>for signal "1" minmum load current</li> <li>for signal "0" residual current, max.</li> <li>for signal "1" minimum load current</li> <li>for signal "1" ninimum load current</li> <li>for signal "1" ninimum load current</li> <li>for signal "1" ninimum load current</li> <li>for signal "1" residual current</li> <li>fo</li></ul>		Yes
<ul> <li>on lamp load, max.</li> <li>Load resistance range</li> <li>lower limit</li> <li>upper limit</li> <li>12 kΩ</li> <li>Output voltage</li> <li>Type of output voltage</li> <li>of or signal "1", min.</li> <li>23.2 V; L+ (-0.8 V)</li> <li>Output current</li> <li>of or signal "1" permissible range, max.</li> <li>of or signal "1" permissible range, max.</li> <li>of or signal "0" residual current</li> <li>of or signal "0" residual current, max.</li> <li>O.5 A; Per digital output</li> <li>of or signal "1" minimum load current</li> <li>2 mA</li> <li>of or signal "0" residual current, max.</li> <li>0.5 mA</li> </ul> Output delay with resistive load <ul> <li>"0" to "1", max.</li> <li>"1" to "0", max.</li> <li>50 μs</li> </ul> Switching frequency <ul> <li>with resistive load, max.</li> <li>on lamp load, max.</li> <li>on lamp load, max.</li> <li>on lamp load, max.</li> <li>to Hz</li> <li>current per module, max.</li> <li>2 A</li> </ul> Cable length <ul> <li>shelded, max.</li> <li>on lamp load, max.</li> <li>on max.</li> <li>shelded, max.</li> <li>on max.</li> <li>on max.</li> <li>shelded, max.</li> <li>on max.<!--</td--><td></td><td></td></li></ul>		
Load resistance range     Load resistance range ran		
<ul> <li>lower limit</li></ul>		5 W
<ul> <li>upper limit</li> <li>Output voltage</li> <li>Type of output voltage</li> <li>for signal "1", min.</li> <li>23.2 V; L+ (-0.8 V)</li> <li>Output current</li> <li>for signal "1" rated value</li> <li>of or signal "1" minimum load current</li> <li>of or signal "1" minimum load current</li> <li>of or signal "0" residual current, max.</li> <li>o.5 mA</li> <li>Output delay with resistive load</li> <li>"0" to "1", max.</li> <li>"1" to "0", max.</li> <li>So μs</li> <li>"1" to "0", max.</li> <li>Switching frequency</li> <li>with inductive load, max.</li> <li>on lamp load, max.</li> <li>on lamp load, max.</li> <li>Cable length</li> <li>shielded, max.</li> <li>unshielded, max.</li> <li>unshielded, max.</li> <li>enshielded, max.</li> <li>enshielded, max.</li> <li>enshielded, max.</li> <li>enshielded, max.</li> <li>enshielded, max.</li> <li>encoder</li> <li>Encoder</li> <li>Encoder signals, incremental encoder (symmetrical)</li> <li>Input voltage</li> <li>Input requency, max.</li> <li>4 MHz</li> <li>With quadruple evaluation</li> </ul>	•	
Output voltage  • Type of output voltage • for signal "1", min.  Output current  • for signal "1" rated value • for signal "1" rated value • for signal "1" minimum load current • for signal "1" minimum load current • for signal "0" residual current, max.  • for signal "0" residual current, max.  Output delay with resistive load • "0" to "1", max. • "1" to "0", max.  Switching frequency • with resistive load, max. • with inductive load, max. • on lamp load, max. • on lamp load, max. • Output delay max. • Output delay with resistive load  • "1" to "0", max.  Switching frequency • with resistive load, max. • Uo Hz  Courrent per module, max. • Output delay max. • Output delay with resistive load • "0" to "1", max. • With resistive load, max. • Output delay with resistive load, max. • Output delay with resistive load • "0" to "1", max. • With resistive load, max. • Output grequency • With resistive load, max. • Output grequency • In DC-13; observe derating curve • Output grequency • With resistive load, max. • Output grequency • Output grequency • Input frequency, max. • Output grequency, max. • Output grequency, max. • A MHz; with quadruple evaluation		
<ul> <li>Type of output voltage</li> <li>for signal "1", min.</li> <li>23.2 V; L+ (-0.8 V)</li> <li>Output current</li> <li>for signal "1" rated value</li> <li>o.5 A; Per digital output</li> <li>for signal "1" minimum load current</li> <li>for signal "1" minimum load current</li> <li>for signal "0" residual current, max.</li> <li>0.5 mA</li> <li>Output delay with resistive load</li> <li>"0" to "1", max.</li> <li>"1" to "0", max.</li> <li>50 μs</li> <li>"1" to "0", max.</li> <li>switching frequency</li> <li>with resistive load, max.</li> <li>on lamp load, max.</li> <li>to Hz</li> <li>current per module, max.</li> <li>current per module, max.</li> <li>a Shelded, max.</li> <li>a shielded, max.</li> <li>a shielded, max.</li> <li>a unshielded, max.</li> <li>a unshielded, max.</li> <li>a linguity of the current of the coder (symmetrical)</li> <li>Input voltage</li> <li>Input frequency, max.</li> <li>4 MHz</li> <li>counting frequency, max.</li> <li>4 MHz; with quadruple evaluation</li> </ul>		12 kΩ
• for signal "1", min.  Output current  • for signal "1" rated value • for signal "1" permissible range, max. • for signal "1" minimum load current • for signal "0" residual current, max. • for signal "0" residual current, max.  Output delay with resistive load • "0" to "1", max. • "1" to "0", max.  Switching frequency • with resistive load, max. • on lamp load, max. • on lamp load, max. • Output of the outputs • Current per module, max. • shelded, max. • shelded, max. • unshielded, max. • unshielded, max. • In 000 m • shielded, max. • In 1000 m • Input voltage • Input frequency, max.  I MHz • Counting frequency, max.  4 MHz; with quadruple evaluation	_	
Output current  • for signal "1" rated value • for signal "1" permissible range, max. • for signal "1" minimum load current • for signal "0" residual current, max. • 0.5 mA  Output delay with resistive load • "0" to "1", max. • "1" to "0", max. • "1" to "0", max.  50 µs  Switching frequency • with resistive load, max. • uith inductive load, max. • on lamp load, max. 10 kHz • on lamp load, max. 10 Hz  Total current of the outputs • Current per module, max. 2 A  Cable length • shielded, max. • unshielded, max. • unshielded, max. • unshielded, max. • loop m  Encoder  Encoder signals, incremental encoder (symmetrical) • Input voltage • Input frequency, max. • Counting frequency, max.  4 MHz; with quadruple evaluation		
<ul> <li>for signal "1" rated value</li> <li>for signal "1" permissible range, max.</li> <li>for signal "1" minimum load current</li> <li>for signal "0" residual current, max.</li> <li>for signal "0" residual current, max.</li> <li>50 µs</li> <li>"0" to "1", max.</li> <li>"1" to "0", max.</li> <li>\$0 µs</li> <li>with resistive load, max.</li> <li>with resistive load, max.</li> <li>with inductive load, max.</li> <li>on lamp load, max.</li> <li>on lamp load, max.</li> <li>Current per module, max.</li> <li>a shielded, max.</li> <li>a shielded, max.</li> <li>a unshielded, max.</li> <li>a unshielded, max.</li> <li>b shielded, max.</li> <li>a unshielded, max.</li> <li>a lnput voltage</li> <li>lnput voltage</li> <li>lnput frequency, max.</li> <li>Counting frequency, max.</li> <li>A MHz</li> <li>WhHz</li> <li>Counting frequency, max.</li> <li>4 MHz; with quadruple evaluation</li> </ul>		23.2 V; L+ (-0.8 V)
<ul> <li>for signal "1" permissible range, max.</li> <li>for signal "1" minimum load current</li> <li>for signal "0" residual current, max.</li> <li>0.5 mA</li> </ul> Output delay with resistive load <ul> <li>"0" to "1", max.</li> <li>"1" to "0", max.</li> </ul> 50 μs <li>switching frequency</li> <li>with resistive load, max.</li> <li>with inductive load, max.</li> <li>on lamp load, max.</li> <li>on lamp load, max.</li> <li>Current of the outputs</li> <li>Current per module, max.</li> <li>shielded, max.</li> <li>unshielded, max.</li> <li>unshielded, max.</li> <li>unshielded, max.</li> <li>foo m</li> Encoder  Encoder signals, incremental encoder (symmetrical)  RS 422  Input voltage  Input frequency, max. <li>Counting frequency, max.</li> <li>MHz</li> <li>Counting frequency, max.</li> <li>4 MHz; with quadruple evaluation</li>	·	
<ul> <li>for signal "1" minimum load current</li> <li>for signal "0" residual current, max.</li> <li>0.5 mA</li> </ul> Output delay with resistive load <ul> <li>"0" to "1", max.</li> <li>"1" to "0", max.</li> </ul> 50 μs  Switching frequency <ul> <li>with resistive load, max.</li> <li>with inductive load, max.</li> <li>on lamp load, max.</li> <li>to Hz</li> </ul> Total current of the outputs <ul> <li>Current per module, max.</li> <li>shielded, max.</li> <li>unshielded, max.</li> <li>unshielded, max.</li> <li>unshielded, max.</li> <li>nunshielded, max.</li> <li>nunshie</li></ul>	-	
<ul> <li>for signal "0" residual current, max.</li> <li>Output delay with resistive load</li> <li>• "0" to "1", max.</li> <li>• "1" to "0", max.</li> <li>50 µs</li> <li>Switching frequency</li> <li>• with resistive load, max.</li> <li>• with inductive load, max.</li> <li>• on lamp load, max.</li> <li>• on lamp load, max.</li> <li>• Current of the outputs</li> <li>• Current per module, max.</li> <li>• Shielded, max.</li> <li>• shielded, max.</li> <li>• unshielded, max.</li> <li>• Input voltage</li> <li>• Input voltage</li> <li>• Input frequency, max.</li> <li>• Counting frequency, max.</li> <li>• Counting frequency, max.</li> <li>• MHz, with quadruple evaluation</li> </ul>		
Output delay with resistive load  • "0" to "1", max. • "1" to "0", max.  50 µs  Switching frequency  • with resistive load, max. • with inductive load, max. • on lamp load, max. • on lamp load, max.  • Current of the outputs • Current per module, max.  • shielded, max. • unshielded, max. • unshielded, max. • unshielded, max.  Encoder  Encoder signals, incremental encoder (symmetrical) • Input voltage • Input frequency, max. • Counting frequency, max. • Counting frequency, max. • Counting frequency, max. • Counting frequency, max. • WHZ; with quadruple evaluation	G .	2 mA
<ul> <li>"0" to "1", max.</li> <li>"1" to "0", max.</li> <li>Switching frequency</li> <li>with resistive load, max.</li> <li>with inductive load, max.</li> <li>on lamp load, max.</li> <li>10 Hz</li> <li>Total current of the outputs</li> <li>Current per module, max.</li> <li>2 A</li> <li>Cable length</li> <li>shielded, max.</li> <li>unshielded, max.</li> <li>600 m</li> <li>Encoder</li> <li>Encoder signals, incremental encoder (symmetrical)</li> <li>Input voltage</li> <li>Input frequency, max.</li> <li>1 MHz</li> <li>Counting frequency, max.</li> <li>4 MHz; with quadruple evaluation</li> </ul>		0.5 mA
• "1" to "0", max.  Switching frequency  • with resistive load, max.  • with inductive load, max.  • on lamp load, max.  • Current of the outputs  • Current per module, max.  2 A  Cable length  • shielded, max.  • unshielded, max.  • unshielded, max.  Encoder  Encoder signals, incremental encoder (symmetrical)  • Input voltage • Input frequency, max.  • Counting frequency, max.  4 MHz; with quadruple evaluation		
Switching frequency  • with resistive load, max.  • with inductive load, max.  • on lamp load, max.  • Current of the outputs  • Current per module, max.  • shielded, max.  • unshielded, max.  • Input voltage  • Input frequency, max.  • Counting frequency, max.  • With resistive load, max.  10 kHz  10 kHz  10 kHz  10 kHz  2 A Counting frequency, max.  10 Hz  10 MB		50 μs
<ul> <li>with resistive load, max.</li> <li>with inductive load, max.</li> <li>0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve</li> <li>on lamp load, max.</li> <li>10 Hz</li> </ul> Total current of the outputs <ul> <li>Current per module, max.</li> <li>2 A</li> </ul> Cable length <ul> <li>shielded, max.</li> <li>unshielded, max.</li> <li>foo m</li> </ul> Encoder Encoder Encoder signals, incremental encoder (symmetrical) <ul> <li>RS 422</li> <li>Input voltage</li> <li>Input frequency, max.</li> <li>MHz</li> <li>Counting frequency, max.</li> <li>4 MHz; with quadruple evaluation</li> </ul>	• "1" to "0", max.	50 µs
<ul> <li>with inductive load, max.</li> <li>on lamp load, max.</li> <li>10 Hz</li> </ul> Total current of the outputs <ul> <li>Current per module, max.</li> <li>\$\text{Stable length}\$</li> <li>shielded, max.</li> <li>unshielded, max.</li> <li>600 m</li> </ul> Encoder Encoder signals, incremental encoder (symmetrical) <ul> <li>Input voltage</li> <li>Input frequency, max.</li> <li>Counting frequency, max.</li> <li>4 MHz; with quadruple evaluation</li> </ul>	· · · · ·	
<ul> <li>on lamp load, max.</li> <li>Total current of the outputs</li> <li>Current per module, max.</li> <li>2 A</li> <li>Cable length</li> <li>shielded, max.</li> <li>unshielded, max.</li> <li>foo m</li> </ul> Encoder Encoder signals, incremental encoder (symmetrical) <ul> <li>Input voltage</li> <li>Input frequency, max.</li> <li>Ocunting frequency, max.</li> <li>4 MHz; with quadruple evaluation</li> </ul>	·	10 kHz
Total current of the outputs  Current per module, max.  2 A  Cable length  shielded, max.  unshielded, max.  1 000 m  600 m  Encoder  Encoder Signals, incremental encoder (symmetrical)  Input voltage Input frequency, max.  MHz  Counting frequency, max.  4 MHz; with quadruple evaluation		0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
Cable length  shielded, max.  unshielded, max.  1 000 m  ounshielded, max.  600 m   Encoder  Encoder signals, incremental encoder (symmetrical)  Input voltage Input frequency, max.  Counting frequency, max.  4 MHz; with quadruple evaluation		10 Hz
Cable length  • shielded, max. • unshielded, max.  • unshielded, max.  600 m  Encoder  Encoder signals, incremental encoder (symmetrical)  • Input voltage • Input frequency, max.  • Counting frequency, max.  4 MHz; with quadruple evaluation		
<ul> <li>shielded, max.</li> <li>unshielded, max.</li> <li>600 m</li> </ul> Encoder Encoder signals, incremental encoder (symmetrical) <ul> <li>Input voltage</li> <li>Input frequency, max.</li> <li>Counting frequency, max.</li> <li>4 MHz; with quadruple evaluation</li> </ul>	Current per module, max.	2 A
<ul> <li>unshielded, max.</li> <li>Encoder</li> <li>Encoder signals, incremental encoder (symmetrical)</li> <li>Input voltage</li> <li>Input frequency, max.</li> <li>Counting frequency, max.</li> <li>4 MHz; with quadruple evaluation</li> </ul>	Cable length	
Encoder  Encoder signals, incremental encoder (symmetrical)  • Input voltage • Input frequency, max. • Counting frequency, max.  4 MHz; with quadruple evaluation	• shielded, max.	1 000 m
Encoder signals, incremental encoder (symmetrical)  • Input voltage  • Input frequency, max.  • Counting frequency, max.  4 MHz; with quadruple evaluation	• unshielded, max.	600 m
<ul> <li>Input voltage</li> <li>Input frequency, max.</li> <li>Counting frequency, max.</li> <li>4 MHz; with quadruple evaluation</li> </ul>	Encoder	
<ul> <li>Input frequency, max.</li> <li>Counting frequency, max.</li> <li>4 MHz; with quadruple evaluation</li> </ul>	Encoder signals, incremental encoder (symmetrical)	
Counting frequency, max.  4 MHz; with quadruple evaluation	Input voltage	RS 422
	<ul> <li>Input frequency, max.</li> </ul>	1 MHz
• Cable length, shielded, max. 32 m; at 1 MHz	Counting frequency, max.	4 MHz; with quadruple evaluation
	Cable length, shielded, max.	32 m; at 1 MHz
• Signal filter, parameterizable Yes	Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset  Yes	<ul> <li>Incremental encoder with A/B tracks 90° phase offset</li> </ul>	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	incremental encoder many 22 stacks, 50 phase encod	
• pulse encoder Yes	• Incremental encoder with A/B tracks, 90° phase offset	Yes
Pulse encoder with direction     Yes	<ul> <li>Incremental encoder with A/B tracks, 90° phase offset and zero track</li> </ul>	
• pulse encoder with one impulse signal per count direction Yes	<ul> <li>Incremental encoder with A/B tracks, 90° phase offset and zero track</li> <li>pulse encoder</li> </ul>	Yes

Encoder signals, incremental angular (as a section to	
Encoder signals, incremental encoder (asymmetrical)	5 V TTL
Input voltage	
• Input frequency, max.	1 MHz
Counting frequency, max.	4 MHz; with quadruple evaluation
Signal filter, parameterizable    Signal filter, parameterizable	Yes
Incremental encoder with A/B tracks, 90° phase offset	Yes
<ul> <li>Incremental encoder with A/B tracks, 90° phase offset and zero track</li> </ul>	Yes
• pulse encoder	Yes
pulse encoder with direction	Yes
pulse encoder with one impulse signal per count direction	Yes
Encoder signals, absolute encoder (SSI)	
• Input signal	to RS-422
Telegram length, parameterizable	10 40 bit
Clock frequency, max.	2 MHz; 125 kHz, 250 kHz, 500 kHz, 1 MHz, 1.5 MHz or 2 MHz
Binary code	Yes
• Gray code	Yes
Cable length, shielded, max.	320 m; Cable length, RS-422 SSI absolute encoders, Siemens type 6FX2001-
Cable length, shielded, max.	5, 24 V supply: 125 kHz, 320 meters shielded, max.; 250 kHz, 160 meters shielded, max.; 500 kHz, 60 meters shielded, max.; 1 MHz, 20 meters shielded, max. 1.5 MHz, 10 meters shielded, max.; 2 MHz, 8 meters shielded, max.
Parity bit, parameterizable	Yes
Monoflop time	16, 32, 48, 64 µs & automatic
Multiturn	Yes
Singleturn	Yes
Interface types	
• TTL 5 V	Yes
• RS 422	Yes
Isochronous mode	
Filtering and processing time (TCI), min.	130 µs; only for pulse and incremental encoders
Bus cycle time (TDP), min.	250 μs
Interrupts/diagnostics/status information	
Alarms	
7 Marino	
Diagnostic alarm	Yes
	Yes Yes
Diagnostic alarm	
Diagnostic alarm     Hardware interrupt	
Diagnostic alarm     Hardware interrupt  Diagnoses	Yes
<ul> <li>Diagnostic alarm</li> <li>Hardware interrupt</li> <li>Diagnoses</li> <li>Monitoring the supply voltage</li> </ul>	Yes Yes
<ul> <li>Diagnostic alarm</li> <li>Hardware interrupt</li> <li>Diagnoses</li> <li>Monitoring the supply voltage</li> <li>Wire-break</li> </ul>	Yes Yes Yes
Diagnostic alarm     Hardware interrupt  Diagnoses     Monitoring the supply voltage     Wire-break     Short-circuit	Yes Yes Yes Yes
Diagnostic alarm     Hardware interrupt  Diagnoses      Monitoring the supply voltage     Wire-break     Short-circuit     A/B transition error at incremental encoder	Yes Yes Yes Yes Yes Yes
Diagnostic alarm Hardware interrupt  Diagnoses  Monitoring the supply voltage Wire-break Short-circuit A/B transition error at incremental encoder Telegram error at SSI encoder	Yes Yes Yes Yes Yes Yes
Diagnostic alarm     Hardware interrupt  Diagnoses     Monitoring the supply voltage     Wire-break     Short-circuit     A/B transition error at incremental encoder     Telegram error at SSI encoder  Diagnostics indication LED	Yes
Diagnostic alarm Hardware interrupt  Diagnoses  Monitoring the supply voltage Wire-break Short-circuit A/B transition error at incremental encoder Telegram error at SSI encoder  Diagnostics indication LED RUN LED	Yes Yes Yes Yes Yes Yes Yes Yes Yes
Diagnostic alarm Hardware interrupt  Diagnoses  Monitoring the supply voltage Wire-break Short-circuit A/B transition error at incremental encoder Telegram error at SSI encoder  Diagnostics indication LED RUN LED ERROR LED	Yes
Diagnostic alarm Hardware interrupt  Diagnoses  Monitoring the supply voltage Wire-break Short-circuit A/B transition error at incremental encoder Telegram error at SSI encoder  Diagnostics indication LED RUN LED ERROR LED MAINT LED	Yes Yes Yes Yes Yes Yes Yes Yes Yes; green LED Yes; red LED Yes; Yellow LED
Diagnostic alarm Hardware interrupt  Diagnoses  Monitoring the supply voltage Wire-break Short-circuit A/B transition error at incremental encoder Telegram error at SSI encoder  Diagnostics indication LED RUN LED RROR LED MAINT LED Monitoring of the supply voltage (PWR-LED)	Yes
Diagnostic alarm Hardware interrupt  Diagnoses  Monitoring the supply voltage Wire-break Short-circuit A/B transition error at incremental encoder Telegram error at SSI encoder  Diagnostics indication LED RUN LED RUN LED REROR LED MAINT LED Monitoring of the supply voltage (PWR-LED) Channel status display	Yes
Diagnostic alarm Hardware interrupt  Diagnoses  Monitoring the supply voltage Wire-break Short-circuit A/B transition error at incremental encoder Telegram error at SSI encoder  Diagnostics indication LED RUN LED RUN LED REROR LED MAINT LED Monitoring of the supply voltage (PWR-LED) Channel status display for channel diagnostics	Yes
Diagnostic alarm Hardware interrupt  Diagnoses  Monitoring the supply voltage Wire-break Short-circuit A/B transition error at incremental encoder Telegram error at SSI encoder  Diagnostics indication LED RUN LED RUN LED REROR LED MAINT LED Monitoring of the supply voltage (PWR-LED) Channel status display for channel diagnostics  Integrated Functions	Yes Yes Yes Yes Yes Yes Yes Yes; green LED Yes; red LED Yes; green LED
Diagnostic alarm Hardware interrupt  Diagnoses  Monitoring the supply voltage Wire-break Short-circuit A/B transition error at incremental encoder Telegram error at SSI encoder  Diagnostics indication LED RUN LED RROR LED MAINT LED Monitoring of the supply voltage (PWR-LED) Channel status display for channel diagnostics  Integrated Functions  Counter	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes; green LED Yes; red LED Yes; Yellow LED Yes; green LED Yes; green LED Yes; green LED Yes; green LED Yes; red LED
Diagnoses  Monitoring the supply voltage Wire-break Short-circuit A/B transition error at incremental encoder Telegram error at SSI encoder  Diagnostics indication LED RUN LED RROR LED MAINT LED Monitoring of the supply voltage (PWR-LED) Channel status display for channel diagnostics  Integrated Functions  Counter Number of counters	Yes Yes Yes Yes Yes Yes Yes Yes Yes; green LED Yes; red LED Yes; Yellow LED Yes; green LED
Diagnoses  Monitoring the supply voltage Wire-break Short-circuit A/B transition error at incremental encoder Telegram error at SSI encoder  Diagnostics indication LED RUN LED RROR LED MAINT LED Monitoring of the supply voltage (PWR-LED) Channel status display for channel diagnostics  Integrated Functions  Counter Number of counters Counting frequency, max.	Yes Yes Yes Yes Yes Yes Yes Yes Yes; green LED Yes; red LED Yes; Yellow LED Yes; green LED
Diagnoses  Monitoring the supply voltage Wire-break Short-circuit A/B transition error at incremental encoder Telegram error at SSI encoder  Diagnostics indication LED RUN LED RUN LED REROR LED MAINT LED Monitoring of the supply voltage (PWR-LED) Channel status display for channel diagnostics  Integrated Functions  Counter Number of counters Counting frequency, max.  Counting functions	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes; green LED Yes; red LED Yes; green LED Yes; with quadruple evaluation
Diagnoses  Monitoring the supply voltage Wire-break Short-circuit A/B transition error at incremental encoder Telegram error at SSI encoder  Diagnostics indication LED RUN LED RUN LED REROR LED MAINT LED Monitoring of the supply voltage (PWR-LED) Channel status display for channel diagnostics  Integrated Functions  Counter Number of counters Counting frequency, max.  Counting functions Can be used with TO High_Speed_Counter	Yes Yes Yes Yes Yes Yes Yes Yes Yes; green LED Yes; red LED Yes; qreen LED Yes; green LED Yes; green LED Yes; green LED Yes; green LED Yes; ored LED Yes; ored LED Yes; red LED Yes; red LED
Diagnoses  Monitoring the supply voltage Wire-break Short-circuit A/B transition error at incremental encoder Telegram error at SSI encoder  Diagnostics indication LED RUN LED RUN LED RAINT LED Monitoring of the supply voltage (PWR-LED) Channel status display for channel diagnostics  Integrated Functions  Counter Number of counters Counting frequency, max.  Counting functions Can be used with TO High_Speed_Counter Continuous counting	Yes
Diagnoses  Monitoring the supply voltage Wire-break Short-circuit A/B transition error at incremental encoder Telegram error at SSI encoder  Diagnostics indication LED RUN LED RUN LED REROR LED Maint LED Monitoring of the supply voltage (PWR-LED) Channel status display for channel diagnostics  Integrated Functions  Counter Number of counters Counting frequency, max.  Counting functions Can be used with TO High_Speed_Counter Counter Counter Counter Counter Counter Counter Hardware gate via digital input	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes; green LED Yes; red LED Yes; Yellow LED Yes; green LED Yes; ored LED Yes; red LED Yes; red LED
Diagnoses  Monitoring the supply voltage Wire-break Short-circuit A/B transition error at incremental encoder Telegram error at SSI encoder  Diagnostics indication LED RUN LED RUN LED REROR LED Maint LED Monitoring of the supply voltage (PWR-LED) Channel status display for channel diagnostics  Integrated Functions  Counter Number of counters Counting frequency, max.  Counting functions Counter Continuous counting Counter response parameterizable Hardware gate via digital input Software gate	Yes
Diagnoses  Monitoring the supply voltage Wire-break Short-circuit A/B transition error at incremental encoder Telegram error at SSI encoder  Diagnostics indication LED RUN LED RUN LED RUN LED Maint LED Monitoring of the supply voltage (PWR-LED) Channel status display for channel diagnostics  Integrated Functions  Counter Number of counters Counting frequency, max.  Counting functions Can be used with TO High_Speed_Counter Continuous counting Counter response parameterizable Hardware gate via digital input Software gate Event-controlled stop	Yes
Diagnoses  Monitoring the supply voltage Wire-break Short-circuit A/B transition error at incremental encoder Telegram error at SSI encoder  Diagnostics indication LED RUN LED RUN LED REROR LED MAINT LED Monitoring of the supply voltage (PWR-LED) Channel status display for channel diagnostics  Integrated Functions  Counter Number of counters Counting frequency, max.  Counting functions  Can be used with TO High_Speed_Counter Counter response parameterizable Hardware gate via digital input Software gate	Yes

Number of comparators	2; Per channel	
Direction dependency	Yes	
Can be changed from user program	Yes	
Position detection		
Incremental acquisition	Yes	
Absolute acquisition	Yes	
Suitable for S7-1500 Motion Control	Yes	
Measuring functions		
Measuring time, parameterizable	Yes	
<ul> <li>Dynamic measurement period adjustment</li> </ul>	Yes	
<ul> <li>Number of thresholds, parameterizable</li> </ul>	2	
Measuring range		
<ul> <li>Frequency measurement, min.</li> </ul>	0.04 Hz	
<ul> <li>Frequency measurement, max.</li> </ul>	4 MHz	
<ul> <li>Cycle duration measurement, min.</li> </ul>	0.25 μs	
<ul> <li>Cycle duration measurement, max.</li> </ul>	25 s	
Accuracy		
<ul> <li>Frequency measurement</li> </ul>	100 ppm; depending on measuring interval and signal evaluation	
<ul> <li>Cycle duration measurement</li> </ul>	100 ppm; depending on measuring interval and signal evaluation	
Velocity measurement	100 ppm; depending on measuring interval and signal evaluation	
Potential separation		
Potential separation channels		
between the channels	No	
<ul> <li>between the channels and backplane bus</li> </ul>	Yes	
Between the channels and load voltage L+	No	
Isolation		
Isolation tested with	707 V DC (type test)	
Ambient conditions		
Ambient temperature during operation		
<ul> <li>horizontal installation, min.</li> </ul>	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	
<ul> <li>horizontal installation, max.</li> </ul>	70 °C; Please note derating for inductive loads	
<ul> <li>vertical installation, min.</li> </ul>	0 °C	
vertical installation, max.	40 °C; Please note derating for inductive loads	
Altitude during operation relating to sea level		
<ul> <li>Installation altitude above sea level, max.</li> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>	5 000 m  Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax -10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 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  to machinisally active substances according to EN.	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  Use on ships/at sea	Yes; Class 3S4 incl. sand, dust, *	
to biologically active substances according to EN	Yes: Class 6R2 mold and fundal shores (evoluting fauna): Class 6R3 on	
60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request  Yes: Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity	
to chemically active substances according to EN 60721-3-6      to mechanically active substances according to EN	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *  Yes; Class 6S3 incl. sand, dust; *	
60721-3-6	1 co, ciaso coo inci. sanu, adot,	
Usage in industrial process technology		
<ul> <li>Against chemically active substances acc. to EN 60654-4</li> </ul>	Yes; Class 3 (excluding trichlorethylene)	
<ul> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	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 \* The supplied plug covers must remain in place over the unused interfaces conditions acc. to EN 60721, EN 60654-4 and during operation! ANSI/ISA-71.04 Conformal coating • Coatings for printed circuit board assemblies acc. to EN Yes; Class 2 for high reliability • Protection against fouling acc. to EN 60664-3 Yes; Type 1 protection • Military testing according to MIL-I-46058C, Amendment 7 Yes; Discoloration of coating possible during service life • Qualification and Performance of Electrical Insulating Yes; Conformal coating, Class A Compound for Printed Board Assemblies according to IPC-CC-830A Decentralized operation to SIMATIC S7-1500 Yes to standard PROFINET controller Yes Width 35 mm Height 147 mm Depth 129 mm Weights Weight, approx. 325 g

lassifications	

	Version	Classification
eClass	14	27-24-22-05
eClass	12	27-24-22-05
eClass	9.1	27-24-22-05
eClass	9	27-24-22-05
eClass	8	27-24-22-05
eClass	7.1	27-24-22-05
eClass	6	27-24-22-05
ETIM	9	EC001422
ETIM	8	EC001422
ETIM	7	EC001422
IDEA	4	3567
UNSPSC	15	32-15-17-05

## Approvals / Certificates

General Product Approval

Miscellaneous



Manufacturer Declaration





<u>KC</u>

EMV

For use in hazardous locations

Maritime application









last modified:

12/8/2024