

SIPLUS S7-300 SM 331 2AI HART -25...+70 °C with conformal coating based on 6ES7331-7TB00-0AB0

### Supply voltage

#### Load voltage L+

- |                               |      |
|-------------------------------|------|
| • Rated value (DC)            | 24 V |
| • Reverse polarity protection | Yes  |

### Input current

- |   |        |
|---|--------|
| from load voltage L+ (without load), max. | 180 mA |
| from backplane bus 5 V DC, max.           | 100 mA |

### Output voltage

#### Power supply to the transmitters

- |                        |                    |
|------------------------|--------------------|
| • present              | Yes                |
| • Rated value (DC)     | 15 V; at 22 mA     |
| • short-circuit proof  | Yes; approx. 30 mA |
| • No-load voltage (DC) | 29.6 V             |

### Power loss

- |                  |       |
|------------------|-------|
| Power loss, typ. | 4.5 W |
|------------------|-------|

### Analog inputs

- |   |       |
|---|-------|
| Number of analog inputs   | 2     |
| permissible input current for current input (destruction limit), max. | 40 mA |

#### Input ranges (rated values), currents

- |                                    |      |
|------------------------------------|------|
| • 0 to 20 mA                       | Yes  |
| • Input resistance (0 to 20 mA)    | 50 Ω |
| • 4 mA to 20 mA                    | Yes  |
| • Input resistance (4 mA to 20 mA) | 50 Ω |

#### Cable length

- |                  |       |
|------------------|-------|
| • shielded, max. | 400 m |
|------------------|-------|

### Analog value generation for the inputs

- |                       |             |
|-----------------------|-------------|
| Measurement principle | Sigma Delta |
|-----------------------|-------------|

#### Integration and conversion time/resolution per channel

- |  |                                 |
|--|---------------------------------|
| • Resolution with overrange (bit including sign), max. | 16 bit; 10 bit to 15 bit + sign |
| • Integration time, parameterizable                    | Yes                             |
| • Integration time (ms)                                | 2,5 / 16,67 / 20 / 100 ms       |

• Basic conversion time, including integration time (ms)	2.5 / 16.67 / 20 / 100 (1 channel enabled); 7.5 / 50 / 60 / 300 (2 channels enabled)
• Interference voltage suppression for interference frequency f1 in Hz	10 / 50 / 60 / 400 Hz

## Encoder

### Connection of signal encoders

• for current measurement as 2-wire transducer	Yes
• for current measurement as 4-wire transducer	Yes

## Errors/accuracies

Linearity error (relative to input range), (+/-)	0.01 %
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Temperature error (relative to input range), (+/-)	0.01 %/K
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Crosstalk between the inputs, min.	130 dB
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Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.05 %
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### Operational error limit in overall temperature range

• Current, relative to input range, (+/-)	0.55 %; From 0/4 to 20 mA
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### Basic error limit (operational limit at 25 °C)

• Current, relative to input range, (+/-)	0.1 %; From 0/4 to 20 mA
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### Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$ , $f_1 =$ interference frequency

• Series mode interference (peak value of interference < rated value of input range), min.	60 dB
• Common mode interference, min.	130 dB

## Interrupts/diagnostics/status information

Diagnostic functions	Yes; can be set in parameters, red LED, alarm message
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### Alarms

• Diagnostic alarm	Yes; Parameterizable
• Limit value alarm	Yes; Parameterizable, channels 0 and 1

### Diagnostic messages

• Diagnostic information readable	Yes
• Overrange	Yes; Red LED, signal
• Wire-break in signal transmitter cable	Yes; Red LED, signal
• Short-circuit of the signal encoder cable	Yes; Red LED, signal
• HART communication active	Yes; green LED (H)

### Diagnostics indication LED

• Group error SF (red)	Yes
• Channel fault indicator F (red)	Yes

## Ex(i) characteristics

Module for Ex(i) protection	Yes
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### Maximum values of input circuits (per channel)

• Co (permissible external capacity), max.	62 nF
• Io (short-circuit current), max.	96.1 mA

• Lo (permissible external inductivity), max.	3 mH
• Po (power of load), max.	511 mW
• Uo (output no-load voltage), max.	26 V
• Um (fault voltage), max.	250 V; DC
• Ta (permissible ambient temperature), max.	0.6 °C

### Potential separation

#### Potential separation analog inputs

• between the channels	Yes
• between the channels and backplane bus	Yes

### Permissible potential difference

between the inputs (UCM)	60 V DC/30 V AC
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### Isolation

#### tested with

• Channels against backplane bus and load voltage L+	1500 V AC
• Channels among one another	1500 V AC
• Load voltage L+ against backplane bus	500 V DC

### Standards, approvals, certificates

CE mark	Yes
UL approval	Yes; File E239877
FM approval	Yes; CofC 3028431
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes

#### Use in hazardous areas

• Test number KEMA	KEMA 09 ATEX 0082X
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### Ambient conditions

#### Ambient temperature during operation

• min.	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use

#### Ambient temperature during storage/transportation

• min.	-40 °C
• max.	70 °C

#### Altitude during operation relating to sea level

• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	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

<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 under condensation conditions)
<b>Resistance</b>	
<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, *
<b>Use on ships/at sea</b>	
— to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
— to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
— to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
<b>from supply voltage 1L+</b>	
— Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Dimensions</b>	
Width	40 mm
Height	125 mm
Depth	120 mm
<b>Weights</b>	
Weight, approx.	260 g
<b>last modified:</b>	05/18/2018