

# SIEMENS

## Product data sheet

**6ES7331-7TB00-0AB0**


SIMATIC DP, HART ANALOG INPUT SM 331,  
2 AI, 0/4 - 20MA HART,  
FOR ET200M WITH IM153-2, 1 X 20 PIN

Supply voltage	
Load voltage L+	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Input current	
from backplane bus 5 V DC, max.	100 mA
from supply voltage L+, max.	180 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 losses	
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	
Current	Yes
Input ranges (rated values), currents	
0 to 20 mA	Yes
Input resistance (0 to 20 mA)	50 $\Omega$
4 to 20 mA	Yes
Input resistance (4 to 20 mA)	50 $\Omega$
Cable length	
Cable length, shielded, max.	400 m
Analog value creation	
Measurement principle	Sigma Delta
Integrations and conversion time/ resolution per channel	
Resolution with overrange (bit including sign), max.	16 bit ; 10 to 15 bits + 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 area)	+/- 0.01 %
Temperature error (relative to input area)	+/- 0.01 %
Crosstalk between the inputs, min.	130 dB
Repeat accuracy in settled status at 25 °C (relative to input area)	+/- 0.05 %
Operational limit in overall temperature range	

Current, relative to input area	+/- 0,45 % ; From 0/4 to 20 mA
<b>Basic error limit (operational limit at 25 °C)</b>	
Current, relative to input area	+/- 0,1 % ; From 0/4 to 20 mA
<b>Interference voltage suppression for <math>f = n \times (f_l \pm 1\%)</math>, <math>f_l</math> = interference frequency</b>	
Series mode interference (peak value of interference < rated value of input range), min.	60 dB
Common mode interference, min.	130 dB
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
Diagnostic alarm	Yes ; Parameterizable
Limit value alarm	Yes ; Parameterizable, channels 0 and 1
<b>Diagnostic messages</b>	
Diagnostic functions	Yes ; can be set in parameters, red LED, alarm message
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)
<b>Diagnostics indication LED</b>	
Group error SF (red)	Yes
Channel error indicator F (red)	Yes
<b>Ex(i) characteristics</b>	
Module for Ex(i) protection	Yes
<b>Max. values of input circuits (per channel)</b>	
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
<b>Galvanic isolation</b>	
between the channels and backplane bus	Yes

<b>Galvanic isolation analog inputs</b>	
Galvanic isolation analog inputs	Yes
<b>Galvanic isolation analog outputs</b>	
between the channels	Yes
between the channels and the load voltage L+	Yes
<b>Permissible potential difference</b>	
between the inputs (UCM)	60 V DC/30 V AC
<b>Isolation</b>	
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
<b>Standards, approvals, certificates</b>	
FM approval	Available soon
<b>Use in hazardous areas</b>	
Type of protection acc. to EN 50020 (CENELEC)	[EEx ib] IIC
Type of protection acc. to FM	Class I, Division 2, Group A, B, C, D T4; Class I, Zone 2, Group IIC T4
Test number KEMA	KEMA 97; ATEX3039 X
Type of protection acc. to KEMA	II3 (2) G Eex nA [ib] IIC T4
<b>Ambient conditions</b>	
Operating temperature	
max.	60 °C
<b>Dimensions</b>	
Width	40 mm
Height	125 mm
Depth	120 mm
<b>Weight</b>	
Weight, approx.	260 g
Status	Jun 23, 2012