

SIMATIC DP, HART analog input SM 331, 2 AI, 0/4 - 20 mA HART, to HART rev. 5.0, for ET200M with IM 153-2, 1 x 20-pole



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
<b>Input ranges (rated values), currents</b>	
• 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
<b>Cable length</b>	
• shielded, max.	400 m

### Analog value generation for the inputs

Measurement principle	Sigma Delta
<b>Integration and conversion time/resolution per channel</b>	
• 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

<b>Connection of signal encoders</b>	
• 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 %
Temperature error (relative to input range), (+/-)	0.01 %/K
Crosstalk between the inputs, min.	130 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.05 %
<b>Operational error limit in overall temperature range</b>	
• Current, relative to input range, (+/-)	0.45 %; From 0/4 to 20 mA
<b>Basic error limit (operational limit at 25 °C)</b>	
• Current, relative to input range, (+/-)	0.1 %; From 0/4 to 20 mA
<b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, f1 = interference frequency</b>	
• 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

Diagnostics function	Yes; can be set in parameters, red LED, alarm message
<b>Alarms</b>	
• Diagnostic alarm	Yes; Parameterizable

• Limit value alarm	Yes; Parameterizable, channels 0 and 1
<b>Diagnostic messages</b>	
• 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 fault indicator F (red)	Yes
<b>Ex(i) characteristics</b>	
Module for Ex(i) protection	Yes
<b>Maximum 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>Potential separation</b>	
<b>Potential separation analog inputs</b>	
• between the channels	Yes
• between the channels and backplane bus	Yes
<b>Permissible potential difference</b>	
between the inputs (UCM)	60 V DC/30 V AC
<b>Isolation</b>	
<b>tested with</b>	
• Channels against backplane bus and load voltage L+	1500 V AC
• Between channels	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)	[Ex 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
• Type of protection acc. to KEMA	II3 (2) G Eex nA [ib] IIC T4

• Test number KEMA

KEMA 97 ATEX 3039X

### Ambient conditions

Ambient temperature during operation

• max.

60 °C

### Dimensions

Width

40 mm

Height

125 mm

Depth

120 mm

### Weights

Weight, approx.

260 g

**last modified:**

06/19/2019