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Data sheet 6DL1136-6AA00-0PH1



SIMATIC ET 200SP HA, analog input module, safety-oriented, F-AI 8xI 2-wire/4-wire HART HA, 16-bit, 2-wire/4-wire, SIL3 (IEC 61508), up to PL e (ISO 13849-1), suitable for terminal block H1, F1, color code CC00, channel diagnostics

General information	
Product type designation	F-AI 8xI 2-/4-wire HART HA
Firmware version	V1.0
● FW update possible	Yes
Usable terminal block	TB type H1, F1, H0 and N0
Color code for module-specific color identification plate	CC00
Product function	
● I&M data	Yes; I&M0 to I&M3
Redundancy	
● Redundancy capability	Yes; with TB type F1
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
Input current	
Current consumption (rated value)	90 mA; without sensor supply
Encoder supply	
Number of outputs	8
Short-circuit protection	Yes
24 V encoder supply	
● 24 V	Yes
● Short-circuit protection	Yes
● Output current per channel, max.	30 mA
Power	
Power available from the backplane bus	90 mW
Power loss	
Power loss, typ.	2.8 W
Address area	
Address space per module	
● Inputs	22 byte
● Outputs	5 byte
Analog inputs	
Number of analog inputs	
● For current measurement	8
permissible input current for current input (destruction limit), max.	35 mA
Input ranges (rated values), currents	
● 0 to 20 mA	Yes
— Input resistance (0 to 20 mA)	150 Ω

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● 4 mA to 20 mA	Yes
— Input resistance (4 mA to 20 mA)	150 Ω
HART communication	
● Primary Master	Yes
● Secondary Master	No
● input resistance (with HART communication)	150 Ω; for operation with an external secondary master (e.g. communicator), an external load may be necessary to achieve a total impedance of 230 - 600 Ω.
Cable length	
● shielded, max.	1 000 m; shielded, twisted pair
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
● Integration time, parameterizable	Yes
● Integration time (ms)	20 ms (at 50 Hz); 16.66 ms (at 60 Hz)
● Interference voltage suppression for interference frequency f1 in Hz	50 / 60 Hz
Smoothing of measured values	
● parameterizable	Yes; in 4 stages (1, 4, 16, 64 conversion cycles), channel-by-channel
Encoder	
Connection of signal encoders	
● for current measurement as 2-wire transducer	Yes
● for current measurement as 4-wire transducer	Yes
Errors/accuracies	
Crosstalk between the inputs, min.	-70 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.008 %
safety-relevant accuracy	
● up to 40 °C, max.	0.6 %; (0.7% in vertical installation)
● up to 70 °C, max.	0.9 %
note regarding accuracy	the safety-relevant accuracy consists of a basic error, a temperature-dependent drift, aging and internal safety measures
Influence of a HART signal modulated on the input signal in relation to input range	
● error at 16.6 ms integration time	0.11 %
● error at 20 ms integration time	0.11 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
● Series mode interference (peak value of interference < rated value of input range), min.	40 dB
● Common mode voltage, max.	35 V
● Common mode interference, min.	80 dB
Protocols	
HART protocol	Yes
● Protocol version	up to Revision 7
Interrupts/diagnostics/status information	
Alarms	
● Diagnostic alarm	Yes
Diagnoses	
● Monitoring the supply voltage	Yes
● Wire-break	Yes
● Short-circuit	Yes
● Overflow/underflow	Yes
Diagnostics indication LED	
● MAINT LED	Yes; Yellow 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
Potential separation	
Potential separation channels	
● between the channels	No
● between the channels and backplane bus	Yes
● Between the channels and load voltage L+	No

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Permissible potential difference	
between the inputs (UCM)	30 V DC / 25 V AC
Isolation	
tested with	
● between backplane bus and load voltage	1 500 V DC (load voltage L+ and channels I+n bridged)
● between the backplane bus and functional ground (FE)	1 500 V DC
● between load voltage and functional ground (FE)	1 500 V DC (load voltage L+ and channels I+n bridged)
● between the channels and load voltage	370 V AC
● between the potential groups of the channels	370 V AC
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
● Performance level according to ISO 13849-1	PLd (PLe for 1oo2 voting on the F-CPU)
● Category according to ISO 13849-1	cat. 3 (cat. 4 for 1oo2 voting on the F-CPU)
● SIL acc. to IEC 61508	Up to SIL 3
Probability of failure (for service life of 20 years and repair time of 100 hours)	
— Low demand mode: PFDavg in accordance with SIL3	< 27E-05 (< 9E-05 for 1oo2 voting on the F-CPU)
— High demand/continuous mode: PFH in accordance with SIL3	< 4E-09 1/h (< 1E-09 1/h for 1oo2 voting on the F-CPU)
Ambient conditions	
Ambient temperature during operation	
● horizontal installation, min.	-40 °C
● horizontal installation, max.	70 °C
● vertical installation, min.	-40 °C
● vertical installation, max.	60 °C
Dimensions	
Width	22.5 mm
Height	115 mm
Depth	138 mm
Weights	
Weight, approx.	220 g

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