SIEMENS

Data sheet

6ES7531-7QD00-0AB0



SIMATIC S7-1500 Analog input module AI 4xU/I/RTD/TC ST, 16 bit resolution, Accuracy 0.3%, 4 channels in groups of 4; 2 channels for RTD measurement; Common mode voltage 10 V; Diagnostics; Hardware interrupts; Delivery including push-in front connector, infeed element, shield bracket, and shield terminal

General information	
Product type designation	AI 4xU/I/RTD/TC ST
HW functional status	From FS01
Firmware version	V1.0.0
 FW update possible 	Yes
Product function	
• I&M data	Yes; I&M0 to I&M3
 Isochronous mode 	No
 Prioritized startup 	No
 Measuring range scalable 	No
 Scalable measured values 	No
 Adjustment of measuring range 	No
Engineering with	
 STEP 7 TIA Portal configurable/integrated from version 	V13 / V13.0.2
 STEP 7 configurable/integrated from version 	V5.5 SP3 / -
 PROFIBUS from GSD version/GSD revision 	V1.0 / V5.1
 PROFINET from GSD version/GSD revision 	V2.3 / -
Operating mode	
Oversampling	No
• MSI	Yes
CiR - Configuration in RUN	
Reparameterization possible in RUN	Yes
Calibration possible in RUN	Yes
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, max.	140 mA; with 24 V DC supply
Encoder supply	
24 V encoder supply	
Short-circuit protection	Yes
• Output current, max.	20 mA; Max. 47 mA per channel for a duration < 10 s
Power	
Power available from the backplane bus	0.7 W
Power loss	
Power loss, typ.	2.3 W

Number of analog inputs 4 • For current measurement 4 • For resistance/resistance thermometer measurement 2 • For resistance/resistance thermometer measurement 2 • For resistance/resistance thermometer measurement 2 • For resistance/resistance thermometer measurement or unage to value to va	Analog inputs	
		4
• For Voltage measurement 4 • For streament 2 • For streament 4 permissible inpla voltage for voltage input (destruction imm), max. 28.8 V permissible inpla current for releatance-type transmitter, typ. 40 mA Constant measurement unput (destruction imm), max. 40 mA Constant measurement unput (destruction imm), max. 40 mA Constant measurement unput (destruction imm), max. 600 Ohm, 600 Ohm, 600 Ohm, P100, P1200, N1000, L3-N1000, 0.825 mA, PTC; 0.472 mA Constant measurement unput (destruction immain, max. No Standardization of measured values No • 10 to 5 V Yes - Input resistance (1V to 5 V) Yes - Input resistance (1V to 1V) Yes • Input resistance (250 mV to +25 V) 10 MΩ • 250 mV to +25 mV Yes - Input resistance (50 mV to +25 mV) 10 MΩ • 50 mV to +50 mV Yes - Input resis		
• For resistance/measurement 4 • For thermocouple measurement 4 • Permissible input voltage for voltage input (destruction minit, max. 28.8 V minit, max. 28.8 V permissible input current for current input (destruction minit, max. 40 mA minit, max. 50 Ohm, 500 Ohm, P100, P1200, N100: 1.25 mA; 6.000 Technical unit for temperature measurement adjustable Yes: "OF FK • To 15 V No • To 15 V Yes • Input resistance (1V to 15 V) Yes • Input resistance (25 V to 25 V) Yes • Start Vol 250 mV Yes • Input resistance (25 m V to 250 mV) Yes • Stare Vo		
measurement 4 err thermocupie measurement 4 permissible input voltage for voltage input (destruction inmi), max. 28.8 V permissible input current for current input (destruction inmi), max. 40 mA Constant measurement current for resistance-type arrammiter, typ. 50.0 m, 300.0 m, 600.0 m, Pt100 Pt200 N1001 125.mA, 6.000.0 Pt000 N1000 IC-N10000 0625.mA; PTC: 0.472 mA Technical unit for temperature measurement adjustable Ves. "C/F/K Analog input with oversampling No Standardization of measurement adjustable Ves. "C/F/K - Oto + 5V No - Oto + 1V to 5V Yes - Input resistance (1 V to 5 V) Yes - Input resistance (2 V to + 12 V) Yes - Input resistance (2 V to + 2.5 V) Yes - Input resistance (2 V to + 12 V) Yes - Input resistance (2 N to + 50 mV) Yes - Input resistance (2 M to + 50 mV) Yes - Input resistance (2 M to + 50 mV) Yes - Input	-	
permissible input voltage for voltage input (destruction imit), max. 28.8 V permissible input current for current input (destruction imit), max. 40 mA Constant measurement current for resistance-type farasmiter, typ. 50.0 hm, 600.0 hm, 600.0 hm, Pti00, Pt200, Nt100: 1.25 mA; 6.000 Mm, Pt000, Nt1000: 0.625 mA; PTC: 0.472 mA Analog input with oversampling Standardization of measured values No Standardization of measured values No Input resistance (1 V to 5 V) Yes I V to 5 V Yes I hopt resistance (1 V to 1 V) 100 kD Yes I hopt resistance (2 V to 1 + 2.5 V) Yes I hopt resistance (2 5 V to 1 + 2.5 V) Yes I hopt resistance (2 5 V to 1 + 5 V) Yes I hopt resistance (2 5 V to 1 + 5 V) Yes I hopt resistance (2 5 V to 1 + 5 V) Yes I hopt resistance (2 N V to 1 + 50 mV) <td></td> <td></td>		
permissible input voltage for voltage input (destruction imit), max. 28.8 V permissible input current for current input (destruction imit), max. 40 mA Constant measurement unrent for resistance-type farasmiter, typ. 50 Ohm, 600 Ohm, Pti00, Pt200, N1000: 0.325 mA; PTC: 0.472 mA Technical unit for temperature measurement adjustable Yes; "C/Fix(Analog input Whoressamping No Standardization of measured values No Input registrate (Tells values), voltages No - 10 to 5 V No - 10 to 5 V Yes Input resistance (1 V to 5 V) No Input resistance (1 V to 1 V) 100 KD Input resistance (1 V to 1 V) 100 KD	For thermocouple measurement	4
permissible input current for current input (destruction imity, max. 40 mA Constant measurement current for resistance-type dimarsmiter, typ. 150 Ohm, 300 Ohm, 600 Ohm, PH00, P1200, NH00: 1.25 mA; 6.000 Technical unit for temperature measurement adjustable Yes; "C/Fix Analog input with oversampling No Standardization of measured values No Input ranges (rated values), voltages No Input ranges (rated values), voltages No Input ranges (rated values), voltages No Input resistance (1 V to 5 V) Yes Input resistance (-1 V to +1 V) 100 kCD Input resistance (-1 V to +1 V) 100 kCD Input resistance (-1 V to +1 V) 100 kCD Input resistance (-2.5 V to +2.5 V) 100 kCD Ze mV to +25 mV Yes Input resistance (-5.5 V to +2.5 V) 100 MCD Ze mV to +25 mV Yes Input resistance (-5.5 V to +2.5 V) 100 MCD Ze mV to +50 mV Yes Input resistance (-50 mV to +50 mV) 100 MCD So mV to +50 mV Yes Input resistance (-50 mV to +50 mV) 100 MCD	permissible input voltage for voltage input (destruction	28.8 V
Constant measurement current for resistance-type frammiter, typ. 150 Ohm, 300 Ohm, 800 Ohm, P100, P1200, N1001; 125 mA; 6 000 Ohm, P1000, N1000, LG-N1000; 0.625 mA; PTC; 0.472 mA Technical unit for temperature measurement adjustable No Anatog input with oversampling No Standardization of measured values No Input ranges (rated values), voltages No Input ranges (rated values), voltages No Input ranges (rated values), voltages No Input resistance (1 V to 5 V) No I to 6 to 5 V No I to 1 to 5 V No I to 4 to 4 V Yes I hight resistance (1 V to 5 V) 100 KD I to 2 to 2 SV Yes I hight resistance (-10 V to +10 V) 100 MD I to 2 to 2 SV Yes I hight resistance (-250 mV to +25 M) 100 MD I to 2 to 5 V Yes I hight resistance (-250 mV to +50 mV) 100 MD I to 50 mV to 50 mV I hight resistance (-260 mV to +50 mV) 10 MD I hight resistance (-30 mV to +50 mV) 10 MD I hight resistance (-30 mV to +50 mV) 1	permissible input current for current input (destruction	40 mA
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Standardzation of measured values No Input ranges (rated values), voltages No • 0 to +5 V No • 0 to +5 V No • 1 V to 5 V Yes - Input resistance (1 V to 5 V) 100 kΩ • 1 V to 5 V Yes - Input resistance (1 V to +1 V) Yes - Input resistance (-10 V to +10 V) 100 kΩ • 2.55 V to +2.5 V Yes - Input resistance (-10 V to +10 V) 100 kΩ • 2.55 V to +2.5 V Yes - Input resistance (-50 mV to +25 mV) 10 MΩ • 2.56 mV to +25 M Yes - Input resistance (-50 mV to +50 mV) 10 MΩ • 500 mV to +50 mV Yes - Input resistance (-50 mV to +50 mV) 10 MΩ • 500 mV to +50 mV Yes - Input resistance (-50 mV to +50 mV) 10 MΩ • 500 mV to +50 mV Yes - Input resistance (-50 mV to +50 mV) 10 MΩ • 500 mV to +50 mV Yes - Input resistance (-50 mV to +50 mV) 10 MΩ • 200 mA Yes - Input	Technical unit for temperature measurement adjustable	Yes; °C/°F/K
Input ranges (rated values), voltages No • 0 to +5 V No • 0 to +10 V No • 1 V to 5 V No • - Input resistance (1 V to 5 V) 10 kΩ • - Input resistance (1 V to +10 V) Yes Input resistance (-10 V to +10 V) 10 MΩ • 10 V to +10 V Yes Input resistance (-25 V to +25 V) 10 MΩ • - 258 mV to +25 mV Yes Input resistance (-25 V to +25 V) 10 MΩ • - 258 mV to +25 mV Yes Input resistance (-25 V to +25 V) 10 MΩ • - 258 mV to +25 mV Yes Input resistance (-50 mV to +250 mV) 10 MΩ • - 250 mV to +250 mV Yes Input resistance (-50 mV to +50 mV) 10 MΩ • Input resistance (-50 mV to +50 mV) 10 MΩ • Input resistance (-50 mV to +50 mV) 10 MΩ • Input resistance (-50 mV to +50 mV) 10 MΩ •	Analog input with oversampling	No
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	• 0 to +10 V	No
• 1 V to +1 V Yes Input resistance (-1 V to +1 V) 10 MΩ • 10 V to +10 V Yes Input resistance (-10 V to +10 V) 100 kΩ • 2.5 V to +2.5 V Yes Input resistance (-25 V to +2.5 V) 10 MΩ • 25 mV to +25 mV No • 250 mV to +25 mV No • 250 mV to +250 mV Yes Input resistance (-250 mV to +250 mV) 10 MΩ • 550 mV to +50 mV Yes Input resistance (-50 mV to +250 mV) 10 MΩ • 50 mV to +50 mV Yes Input resistance (-50 mV to +50 mV) 10 MΩ • 500 mV to +50 mV Yes Input resistance (-50 mV to +50 mV) 10 MΩ • 80 mV to +50 mV Yes Input resistance (-50 mV to +50 mV) 10 MΩ • B0 mV to +80 mV Yes Input resistance (-50 mV to +30 mV) 10 MΩ • 10 to 20 mA Yes Input resistance (-20 mA to +20 mA) 25 Ω, Plus approx. 42 ohms for overvoltage protection by PTC • 4 mA to 20 mA Yes Input resistance (Typ	• 1 V to 5 V	Yes
	— Input resistance (1 V to 5 V)	100 kΩ
• -10 V to +10 V Yes - Input resistance (-10 V to +10 V) 100 kΩ • 2.5 V to +2.5 V Yes - Input resistance (-10 V to +10 V) 100 kΩ • 2.5 mV to +25 mV No • 250 mV to +25 mV No • 250 mV to +25 mV No • 250 mV to +25 mV Yes - Input resistance (-250 mV to +250 mV) 10 MΩ • 5 V to +5 V Yes - Input resistance (-50 mV to +50 mV) 100 kΩ • 500 mV to +50 mV Yes - Input resistance (-50 mV to +50 mV) 10 MΩ • 500 mV to +50 mV Yes - Input resistance (-50 mV to +50 mV) 10 MΩ • 500 mV to +50 mV Yes - Input resistance (-50 mV to +50 mV) 10 MΩ • 500 mV to +50 mV Yes - Input resistance (-50 mV to +80 mV) 10 MΩ Input resistance (-50 mV to +80 mV) 10 MΩ Input resistance (-20 mA to +20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC • A nk to 20 mA Yes - Input resistance (Type B) 10 MΩ • Type B	• -1 V to +1 V	Yes
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• -2.5 V to +2.5 V Yes — Input resistance (-2.5 V to +2.5 V) 10 MΩ • -250 mV to +250 mV No • -250 mV to +250 mV Yes — Input resistance (-25 V to +250 mV) 10 MΩ • -55 V to +5 V Yes — Input resistance (-50 mV to +250 mV) 100 MΩ • -50 mV to +50 mV Yes — Input resistance (-50 mV to +50 mV) 100 MΩ • -500 mV to +500 mV Yes — Input resistance (-50 mV to +50 mV) 10 MΩ • -500 mV to +500 mV Yes — Input resistance (-50 mV to +50 mV) 10 MΩ • -500 mV to +500 mV Yes — Input resistance (-50 mV to +50 mV) 10 MΩ • -500 mV to +500 mV Yes — Input resistance (-50 mV to +50 mV) 10 MΩ • -10 ruput resistance (-50 mV to +80 mV) Yes — Input resistance (-50 mV to +80 mV) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC • 0 to 20 mA Yes — Input resistance (-20 mA to +20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC • 10 mL resistance (-20 mA to +20 mA) Yes	— Input resistance (-10 V to +10 V)	100 kΩ
• -25 mV to +25 mV No • -250 mV to +250 mV Yes - Input resistance (-250 mV to +250 mV) 10 MΩ • 5 V to +5 V Yes - Input resistance (-50 mV to +50 mV) 100 kΩ • -50 mV to +50 mV Yes - Input resistance (-50 mV to +50 mV) 10 MΩ • -500 mV to +500 mV Yes - Input resistance (-50 mV to +50 mV) 10 MΩ • -500 mV to +500 mV Yes - Input resistance (-50 mV to +50 mV) 10 MΩ • -1 mput resistance (-50 mV to +50 mV) 10 MΩ • -1 mput resistance (-50 mV to +50 mV) 10 MΩ • -1 mput resistance (-50 mV to +50 mV) 10 MΩ Input resistance (-50 mV to +50 mV) 10 MΩ Input resistance (-50 mV to +50 mV) 10 MΩ Input resistance (-50 mA to +20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC • -20 mA to +20 mA Yes - Input resistance (-10 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC • Papt resistance (-20 mA) Yes - Input resistance (Type B) 10 MΩ • Type B Yes - Input resistance (Type B) 10 MΩ		Yes
- 250 mV to +250 mV Yes — Input resistance (-250 mV to +250 mV) 10 MΩ • - SV to +5 V Yes — Input resistance (-50 to +5 V) 100 kΩ • - S0 mV to +50 mV Yes — Input resistance (-50 mV to +50 mV) 10 MΩ • - S00 mV to +50 mV Yes — Input resistance (-500 mV to +50 mV) 10 MΩ • - S00 mV to +50 mV Yes — Input resistance (-500 mV to +50 mV) 10 MΩ • - B0 mV to +80 mV Yes — Input resistance (-200 mV to +50 mV) 10 MΩ • B0 mV to +80 mV Yes — Input resistance (-20 mA to +20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC • Log trasistance (-20 mA) Yes — Input resistance (-20 mA) Yes		10 ΜΩ
$\begin{tabular}{lllllllllllllllllllllllllllllllllll$	• -25 mV to +25 mV	No
• -5 V to +5 V Yes — Input resistance (-5 V to +5 V) 100 kΩ • -50 mV to +50 mV Yes — Input resistance (-50 mV to +50 mV) 10 MΩ • -500 mV to +50 mV Yes — Input resistance (-50 mV to +50 mV) 10 MΩ • - 1nput resistance (-50 mV to +50 mV) 10 MΩ • - 1nput resistance (-50 mV to +50 mV) 10 MΩ • - 1nput resistance (-80 mV to +80 mV) 10 MΩ Input resistance (-80 mV to +80 mV) 10 MΩ Input resistance (-80 mV to +80 mV) 10 MΩ Input resistance (-180 mV to +80 mV) 10 MΩ Input resistance (-180 mX to +80 mV) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC • - 1nput resistance (0 to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC • - 1nput resistance (-20 mA to +20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC Input ranges (rated values), thermocouples • Yes • Type B Yes — Input resistance (Type B) 10 MΩ • Type C No • Type F Yes — Input resistance (Type K) 10 MΩ • Type K Yes — Input resist	• -250 mV to +250 mV	Yes
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• -50 mV to +50 mV Yes — Input resistance (-50 mV to +50 mV) 10 MΩ • -500 mV to +500 mV Yes — Input resistance (-500 mV to +500 mV) 10 MΩ • -80 mV to +80 mV Yes — Input resistance (-50 mV to +500 mV) 10 MΩ • -80 mV to +80 mV Yes — Input resistance (-80 mV to +80 mV) 10 MΩ Input ranges (rated values), currents - • 10 to 20 mA Yes — Input resistance (0 to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC • 20 mA to +20 mA Yes — Input resistance (4 mA to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC • Input resistance (4 mA to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC Input resistance (4 mA to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC Input resistance (Type B) 10 MΩ • Type B Yes — Input resistance (Type B) 10 MΩ • Type E Yes — Input resistance (Type E) 10 MΩ • Type K Yes — Input resistance (Type K)	— Input resistance (-5 V to +5 V)	100 kΩ
• -500 mV to +500 mV Yes — Input resistance (-500 mV to +500 mV) 10 MΩ • -80 mV to +80 mV Yes — Input resistance (-80 mV to +80 mV) 10 MΩ Input ranges (rated values), currents Volume • 0 to 20 mA Yes — Input resistance (0 to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC • -20 mA to +20 mA Yes — Input resistance (-20 mA to +20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC • -1nput resistance (-20 mA to +20 mA) Yes — Input resistance (4 mA to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC • Input resistance (4 mA to 20 mA) Yes — Input resistance (Type B) 10 MΩ • Type B Yes — Input resistance (Type B) 10 MΩ • Type C No • Input resistance (Type E) 10 MΩ • Type K Yes — Input resistance (Type K) Yes		Yes
• -500 mV to +500 mV Yes — Input resistance (-500 mV to +500 mV) 10 MΩ • -80 mV to +80 mV Yes — Input resistance (-80 mV to +80 mV) 10 MΩ Input ranges (rated values), currents Volume • 0 to 20 mA Yes — Input resistance (0 to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC • -20 mA to +20 mA Yes — Input resistance (-20 mA to +20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC • -1nput resistance (-20 mA to +20 mA) Yes — Input resistance (4 mA to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC • Input resistance (4 mA to 20 mA) Yes — Input resistance (Type B) 10 MΩ • Type B Yes — Input resistance (Type B) 10 MΩ • Type C No • Input resistance (Type E) 10 MΩ • Type K Yes — Input resistance (Type K) Yes	- Input resistance (-50 mV to +50 mV)	10 ΜΩ
•-80 mV to +80 mV Yes — Input resistance (-80 mV to +80 mV) 10 MΩ Input ranges (rated values), currents Yes • 0 to 20 mA Yes — Input resistance (0 to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC • -20 mA to +20 mA Yes — Input resistance (-20 mA to +20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC • Input resistance (-20 mA to ±0 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC • Input resistance (4 mA to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC Input resistance (4 mA to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC Input resistance (4 mA to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC Input resistance (4 mA to 20 mA) Yes — Input resistance (Type B) 10 MΩ • Type C No • Type C No • Type F Yes — Input resistance (Type F) 10 MΩ • Type K Yes — Input resistance (Type K) Yes — Input resistance (Type K) Yes — Input resistance (T		Yes
•-80 mV to +80 mV Yes — Input resistance (-80 mV to +80 mV) 10 MΩ Input ranges (rated values), currents Yes • 0 to 20 mA Yes — Input resistance (0 to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC • -20 mA to +20 mA Yes — Input resistance (-20 mA to +20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC • Input resistance (-20 mA to ±0 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC • Input resistance (4 mA to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC Input resistance (4 mA to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC Input resistance (4 mA to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC Input resistance (4 mA to 20 mA) Yes — Input resistance (Type B) 10 MΩ • Type C No • Type C No • Type F Yes — Input resistance (Type F) 10 MΩ • Type K Yes — Input resistance (Type K) Yes — Input resistance (Type K) Yes — Input resistance (T	- Input resistance (-500 mV to +500 mV)	10 ΜΩ
Input ranges (rated values), currents Yes - Input resistance (0 to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC - 20 mA to +20 mA Yes - Input resistance (-20 mA to +20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC • 4 mA to 20 mA Yes - Input resistance (-20 mA to +20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC • 4 mA to 20 mA Yes - Input resistance (4 mA to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC Input ranges (rated values), thermocouples Yes - Input resistance (Type B) 10 MΩ • Type C No • Type E Yes - Input resistance (Type E) 10 MΩ • Type J Yes - Input resistance (type J) 10 MΩ • Type K Yes - Input resistance (type J) 10 MΩ • Type K Yes - Input resistance (Type K) Yes - Input resistance (Type K) Yes - Input resistance (Type N) No • Type R Yes - Input re		Yes
• 0 to 20 mAYes- Input resistance (0 to 20 mA)25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC• -20 mA to +20 mAYes- Input resistance (-20 mA to +20 mA)25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC• 4 mA to 20 mAYes- Input resistance (4 mA to 20 mA)25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC• 4 mA to 20 mAYes- Input resistance (4 mA to 20 mA)25 Ω; Plus approx. 42 ohms for overvoltage protection by PTCInput ranges (rated values), thermocouples10 MΩ• Type BYes- Input resistance (Type B)10 MΩ• Type CNo• Type EYes- Input resistance (Type E)10 MΩ• Type JYes- Input resistance (type L)10 MΩ• Type KYes- Input resistance (Type K)10 MΩ• Type INo• Type NYes- Input resistance (Type K)Yes- Input resistance (Type K)10 MΩ• Type NYes- Input resistance (Type K)10 MΩ• Type NYes- Input resistance (Type N)10 MΩ• Type RYes- Input resistance (Type N)10 MΩ• Type RYes- Input resistance (Type R)10 MΩ	— Input resistance (-80 mV to +80 mV)	10 ΜΩ
- Input resistance (0 to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC - 20 mA to +20 mA Yes - Input resistance (-20 mA to +20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC • 4 mA to 20 mA Yes - Input resistance (4 mA to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC Input resistance (4 mA to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC Input resistance (4 mA to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC Input resistance (4 mA to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC Input resistance (4 mA to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC Input resistance (4 mA to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC Input resistance (7 mages (rated values), thermocouples 10 MΩ Input resistance (Type E) 10 MΩ Input resistance (Type K) 10 MΩ Input resistance (Type K) 10 MΩ Input resistance (Type N) 10 MΩ		
• -20 mA to +20 mAYes- Input resistance (-20 mA to +20 mA)25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC• 4 mA to 20 mAYes- Input resistance (4 mA to 20 mA)25 Ω; Plus approx. 42 ohms for overvoltage protection by PTCInput resistance (4 mA to 20 mA)15 Ω; Plus approx. 42 ohms for overvoltage protection by PTCInput resistance (4 mA to 20 mA)25 Ω; Plus approx. 42 ohms for overvoltage protection by PTCInput resistance (4 mA to 20 mA)25 Ω; Plus approx. 42 ohms for overvoltage protection by PTCInput resistance (7 matching approx. 42 ohms for overvoltage protection by PTCInput resistance (1 matching approx. 42 ohms for overvoltage protection by PTCInput resistance (Type B)10 MΩFype CNoInput resistance (Type E)10 MΩYes- Input resistance (Type K)Yes- Input resistance (Type K)Yes- Input resistance (Type K)Yes- Input resistance (Type K)Yes- Input resistance (Type N)Yes- Input resistance (Type N)Yes- Input resistance (Type N)Yes- Input resistance (Type R)Yes- Inpu	• 0 to 20 mA	
Input resistance (-20 mA to +20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC • 4 mA to 20 mA Yes Input resistance (4 mA to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC Input resistance (4 mA to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC Input resistance (4 mA to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC Input resistance (4 mA to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC Input resistance (4 mA to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC Input resistance (7 ma to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC Input resistance (7 ma to 20 mA) 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC Input resistance (Type B) 10 MΩ Input resistance (Type K) Yes Input resistance (Type K) 10 MΩ Input resistance (Type N) 10 MΩ Input resistance (Type N) 10 MΩ Input resistance (Type N) 10 MΩ Input resistance (Type R) Yes Input resistance (Type R) 10 MΩ		25 Ω ; Plus approx. 42 ohms for overvoltage protection by PTC
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— Input resistance (4 mA to 20 mA)25 Ω; Plus approx. 42 ohms for overvoltage protection by PTCInput ranges (rated values), thermocouplesYes• Type BYes— Input resistance (Type B)10 MΩ• Type CNo• Type EYes— Input resistance (Type E)10 MΩ• Type JYes— Input resistance (type E)10 MΩ• Type JYes— Input resistance (type J)10 MΩ• Type KYes— Input resistance (Type K)10 MΩ• Type LNo• Type RYes— Input resistance (Type R)10 MΩ• Type RYes— Input resistance (Type R)10 MΩ		25 Ω ; Plus approx. 42 ohms for overvoltage protection by PTC
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- Input resistance (type J) 10 MΩ • Type K Yes - Input resistance (Type K) 10 MΩ • Type L No • Type N Yes - Input resistance (Type N) 10 MΩ • Type R Yes - Input resistance (Type N) 10 MΩ • Type R Yes - Input resistance (Type R) 10 MΩ	— Input resistance (Type E)	10 ΜΩ
• Type K Yes — Input resistance (Type K) 10 MΩ • Type L No • Type N Yes — Input resistance (Type N) 10 MΩ • Type R Yes — Input resistance (Type R) 10 MΩ • Type R Yes — Input resistance (Type R) 10 MΩ	● Туре Ј	
— Input resistance (Type K) 10 MΩ • Type L No • Type N Yes — Input resistance (Type N) 10 MΩ • Type R Yes — Input resistance (Type R) 10 MΩ • Type R Yes — Input resistance (Type R) 10 MΩ	— Input resistance (type J)	
• Type L No • Type N Yes — Input resistance (Type N) 10 MΩ • Type R Yes — Input resistance (Type R) 10 MΩ	• Туре К	
• Type N Yes - Input resistance (Type N) 10 MΩ • Type R Yes - Input resistance (Type R) 10 MΩ	— Input resistance (Type K)	10 MΩ
— Input resistance (Type N) 10 MΩ • Type R Yes — Input resistance (Type R) 10 MΩ	• Type L	No
• Type R Yes — Input resistance (Type R) 10 MΩ	• Type N	Yes
• Type R Yes — Input resistance (Type R) 10 MΩ	— Input resistance (Type N)	10 ΜΩ
— Input resistance (Type R) 10 MΩ		Yes
• Type S Yes	— Input resistance (Type R)	10 ΜΩ
	• Type S	Yes

— Input resistance (Type S)	10 ΜΩ
Type T	Yes
 Type T Input resistance (Type T) 	10 MΩ
• Type U	No
 Type 0 Type TXK/TXK(L) to GOST 	No
Input ranges (rated values), resistance thermometer	NU
Cu 10	No
Cu 10 according to GOST	No
• Cu 50	No
Cu 50 according to GOST	No
• Cu 100	No
Cu 100 according to GOST	No
• Ni 10	No
Ni 10 according to GOST	No
• Ni 100	Yes; Standard/climate
— Input resistance (Ni 100)	10 MΩ
Ni 100 according to GOST	No
• Ni 1000	Yes; Standard/climate
— Input resistance (Ni 1000)	10 ΜΩ
Ni 1000 according to GOST	No
• LG-Ni 1000	Yes; Standard/climate
— Input resistance (LG-Ni 1000)	10 ΜΩ
• Ni 120	No
 Ni 120 according to GOST 	No
• Ni 200	No
 Ni 200 according to GOST 	No
• Ni 500	No
 Ni 500 according to GOST 	No
• Pt 10	No
 Pt 10 according to GOST 	No
• Pt 50	No
 Pt 50 according to GOST 	No
• Pt 100	Yes; Standard/climate
— Input resistance (Pt 100)	10 MΩ
 Pt 100 according to GOST 	No
• Pt 1000	Yes; Standard/climate
— Input resistance (Pt 1000)	10 ΜΩ
Pt 1000 according to GOST	No
• Pt 200	Yes; Standard/climate
— Input resistance (Pt 200)	10 MΩ
Pt 200 according to GOST	No Voc. Standard/climate
Pt 500 Input registered (Pt 500)	Yes; Standard/climate
— Input resistance (Pt 500)• Pt 500 according to GOST	10 MΩ No
Pt 500 according to GOST Input ranges (rated values), resistors	
• 0 to 150 ohms	Yes
- Input resistance (0 to 150 ohms)	10 MΩ
• 0 to 300 ohms	Yes
- Input resistance (0 to 300 ohms)	10 MΩ
• 0 to 600 ohms	Yes
— Input resistance (0 to 600 ohms)	10 ΜΩ
• 0 to 3000 ohms	No
• 0 to 6000 ohms	Yes
— Input resistance (0 to 6000 ohms)	10 ΜΩ
• PTC	Yes
— Input resistance (PTC)	10 ΜΩ
Thermocouple (TC)	
Temperature compensation	
— parameterizable	Yes
 internal temperature compensation 	Yes

— external temperature compensation via RTD	Yes
 — Compensation for 0 °C reference point temperature 	Yes; fixed value can be set
— Reference channel of the module	No
Cable length	
 shielded, max. 	800 m; for U/I, 200 m for R/RTD, 50 m for TC
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
 Resolution with overrange (bit including sign), max. 	16 bit
Integration time, parameterizable	Yes
Integration time (ms)	2,5 / 16,67 / 20 / 100 ms
Basic conversion time, including integration time (ms)	9 / 23 / 27 / 107 ms
 additional conversion time for wire-break monitoring 	9 ms (to be considered in R/RTD/TC measurement)
 additional conversion time for resistance measurement 	150 ohm, 300 ohm, 600 ohm, Pt100, Pt200, Ni100: 2 ms, 6000 ohm, Pt500, Pt1000, Ni1000, LG-Ni1000, PTC: 4 ms
 Interference voltage suppression for interference frequency f1 in Hz 	400 / 60 / 50 / 10
Time for offset calibration (per module)	Basic conversion time of the slowest channel
Smoothing of measured values	
parameterizable	Yes
Step: None	Yes
Step: low	Yes
Step: Medium	Yes
Step: High	Yes
Encoder	
Connection of signal encoders	
for voltage measurement	Yes
 for current measurement as 2-wire transducer 	Yes
— Burden of 2-wire transmitter, max.	820 Ω Vez
 for current measurement as 4-wire transducer for registering measurement with two wire 	Yes
 for resistance measurement with two-wire connection 	Yes; Only for PTC
 for resistance measurement with three-wire connection 	Yes; All measuring ranges except PTC; internal compensation of the cable resistances
 for resistance measurement with four-wire connection 	Yes; All measuring ranges except PTC
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.02 %
Temperature error (relative to input range), (+/-)	0.005 %/K; With TC type T 0.02 ± % / K
Crosstalk between the inputs, max. Repeat accuracy in steady state at 25 °C (relative to input	-80 dB 0.02 %
range), (+/-)	±6 °C
Temperature error of internal compensation note regarding accuracy	at temperatures below 0 °C, the figures for operating error and
noto regarding accuracy	temperature error are doubled
Operational error limit in overall temperature range	
 Voltage, relative to input range, (+/-) 	0.3 %
 Current, relative to input range, (+/-) 	0.3 %
 Resistance, relative to input range, (+/-) 	0.3 %
 Resistance thermometer, relative to input range, (+/-) 	0.3 %; Ptxxx standard: ±1.5 K, Ptxxx climate: ±0.5 K, Nixxx standard: ±0.5 K, Nixxx climate: ±0.3 K
Thermocouple, relative to input range, (+/-)	0.3 %; Type B: > 600 °C ±4.6 K, type E: > -200 °C ±1.5 K, type J: > -210 °C ±1.9 K, type K: > -200 °C ±2.4 K, type N: > -200 °C ±2.9 K, type R: > 0 °C ±4.7 K, type S: > 0 °C ±4.6 K, type T: > -200 °C ±2.4 K
Basic error limit (operational limit at 25 °C)	
 Voltage, relative to input range, (+/-) 	0.1 %
 Current, relative to input range, (+/-) 	0.1 %
• Resistance, relative to input range, (+/-)	0.1 %
 Resistance thermometer, relative to input range, (+/-) 	0.1 %; Ptxxx standard: ±0.7 K, Ptxxx climate: ±0.2 K, Nixxx standard: ±0.3 K, Nixxx climate: ±0.15 K
 Thermocouple, relative to input range, (+/-) 	0.1 %; Type B: > 600 °C ±1.7 K, type E: > -200 °C ±0.7 K, type J: > -210

	°C ±0.8 K, type K: > -200 °C ±1.2 K, type N: > -200 °C ±1.2 K, type R: > 0 °C ±1.9 K, type S: > 0 °C ±1.9 K, type T: > -200 °C ±0.8 K
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 =	
 Series mode interference (peak value of interference < rated value of input range), min. 	40 dB
Common mode voltage, max.	10 V
 Common mode interference, min. 	60 dB
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
Diagnostic alarm	Yes
Limit value alarm	Yes; two upper and two lower limit values in each case
Diagnoses	
 Monitoring the supply voltage 	Yes
Wire-break	Yes; Only for 1 to 5 V, 4 to 20 mA, TC, R, and RTD
Overflow/underflow	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
 Monitoring of the supply voltage (PWR-LED) 	Yes; green LED
 Channel status display 	Yes; green LED
 for channel diagnostics 	Yes; red LED
 for module diagnostics 	Yes; red LED
Potential separation	
Potential separation channels	
 between the channels 	No
 between the channels, in groups of 	4
 between the channels and backplane bus 	Yes
 between the channels and the power supply of the electronics 	Yes
Permissible potential difference	
between the inputs (UCM)	20 V DC
Between the inputs and MANA (UCM)	10 V DC
Isolation	
Isolation tested with	707 V DC (type test)
Ambient conditions	
Ambient temperature during operation	
 horizontal installation, min. 	-25 °C; From FS03
 horizontal installation, max. 	60 °C
 vertical installation, min. 	-25 °C; From FS03
 vertical installation, max. 	40 °C
Altitude during operation relating to sea level	
 Installation altitude above sea level, max. 	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions	
Width	25 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	210 g
Other	
Note:	Supplied incl. 40-pole push-in front connectors. Additional basic error and noise for integration time = 2.5 ms: Voltage: ±250 mV (±0.02%), ±80 mV (±0.05%), ±50 mV (±0.05%); resistance: 150 Ohms (±0.02%); resistance thermometer: Pt100 climate: ±0.08 K, Ni100 climate: ±0.08 K; thermoelement: Type B, R, S: ±3 K, type E, J, K, N, T: ±1 K
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