SIEMENS

Data sheet

6ES7145-5ND00-0BA0



SIMATIC ET 200AL, AQ 4xU/I, 4xM12, Degree of protection IP67

General information	
Product type designation	AQ 4xU/I
HW functional status	from FS04
Firmware version	V1.0.x
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
STEP 7 TIA Portal configurable/integrated from version	STEP 7 V14 or higher
 STEP 7 configurable/integrated from version 	V5.5 SP4 Hotfix 7 or higher
 PROFIBUS from GSD version/GSD revision 	GSD as of Revision 5
 PROFINET from GSD version/GSD revision 	GSDML V2.3.1
Supply voltage	
power supply according to NEC Class 2 required	No
Load voltage 1L+	
 Rated value (DC) 	24 V
 permissible range, lower limit (DC) 	20.4 V
 permissible range, upper limit (DC) 	28.8 V
Reverse polarity protection	Yes; Against destruction; actuator power supply outputs applied with reversed polarity
Input current	
Current consumption (rated value)	110 mA; without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
Actuator supply	
Number of outputs	4
Short-circuit protection	Yes; per module, electronic
Output current	
Rated value	Total current 1 A up to 45 °C; 0.5 A up to 55 °C
Power loss	
Power loss, typ.	2.6 W
Analog outputs	
Number of analog outputs	4
Voltage output, short-circuit protection	Yes
Voltage output, short-circuit current, max.	24 mA
Current output, no-load voltage, max.	15 V
Cycle time (all channels) max.	1 ms
Output ranges, voltage	
• 0 to 10 V	Yes; 15 bit

• 10 V US 5 V Yes, 16 bit incl. sign • 0 to 20 mA Yes, 16 bit incl. sign • 0 to 20 mA Yes, 16 bit incl. sign • • 0 to 20 mA Yes, 16 bit incl. sign • • 0 to 20 mA Yes, 16 bit incl. sign • • 0 to 20 mA Yes, 16 bit incl. sign • • 0 to 20 mA Yes, 16 bit incl. sign • • 0 to voltage output to write connection Yes, 16 bit • 0 to voltage output to write connection Yes, 16 bit • 0 to runnet output to write connection Yes, 16 bit • or runnet output to write connection Yes, 16 bit • or to runnet output to write connection Yes, 16 bit • with ournet outputs, inductive load, max. 1 µF • with ournet outputs, inductive load, max. 1 µF • with ournet outputs, inductive load, max. 10 Voltages at the output to work MANA • Ottages at the output to work MANA 16 V • Cables length • 0 to resolve load • Or resolve load 1 ms • Or resolve load		Voc 11 hit
Output ranges: current - • 0 to 20 mA Yes: 16 bit • 0 to 20 mA Yes: 16 bit incl. sign • • of voltage output flow-wire connection Yes • for voltage output flow-wire connection Yes • of or unern output flow-wire connection Yes • or unern output flow-wire connection Yes • with output output flow-wire connection Yes • with output output flow-wire connection Yes • with output outputs, inductive load, max. 1 µF • with outputs inductive load, max. 1 mE • or capacitive load 1 ms • bielded, max. 30 m Analog value generation for the outputs 1 for bit • for respacitive load 1 ms • for respacitive load 1 ms • for respacitive load 1 ms	• 1 V to 5 V	Yes; 14 bit
• 10 20 mA Yes: 16 bit • 20 mA Yes: 16 bit • 4 mA to 20 mA Yes: 14 bit Connection of actuators Yes: 14 bit For variant output to-wrise connection Yes Load Impedance (in rated arage of adupt) If P • with current outputs, max. 500 Ω • with current outputs towards MANA 16 V Cable length If P • with current outputs towards MANA 16 V Cable length If P • with current outputs towards MANA 16 V Cable length If P • for resistive load 1 ms • for dags,		Yes; 16 bit incl. sign
• Je mA to 20 mA Yes: 14 bit • for voltage output two-wire connection Yes • for voltage output two-wire connection Yes • for outges output fut-wire connection Yes • for outges output fut-wire connection Yes • for outges output fut-wire connection Yes • for current output fut-wire connection Yes • for current output fut-wire connection Yes • of wire outpage outputs, main 1 kD • with voltage outputs, capabilitie load, max. 1 µF • with output outputs, max. 1 µF • with output to towards MANA 16 V Cable length - • voltages at the outputs forwards MANA 16 V Cable length - • voltages at the outputs forwards MANA 16 bit Setting fine - • for cable with versample (bit including sign), max. 16 bit Setting fine - • for cable with versample (bit including sign), max. 16 bit Setting fine - • for cable with versample (bit including sign), max. 16 bit Setting fine - • for cable with versample (bit including sign), max. 16 bit Setting fine - - • for cable with versample (bit including sign), m	· · · ·	
• An A to 20 mA Yes; 14 bit Connection: of schators • • for voltage output throw-wire connection Yes • for current output to-wire connection Yes • for current outputs, main. 1 kQ • with voltage outputs, apacitive load, max. 1 µF • with current outputs, max. 500 Q • with current outputs (mack load, max. 1 P • with current outputs (mack load, max. 1 P • with current outputs (mack load, max. 1 P • with current outputs (mack load, max. 1 P • with current outputs (mack load, max. 1 P • othrass at the output sowards MANA 10 V • Cable length • • other resistive load 1 ms • for resistive load 0.05 %wK </td <td></td> <td></td>		
Consection of actuators for voltage output trouwire connection Yes for current output tow-wire connection Yes for current output tow-wire connection Yes for current output four-wire connection Yes with voltage output, scapatilive load, max. 1 µF with voltage outputs, capatilive load, max. 1 µF with current outputs, max. 500 Q with current outputs, inductive load, max. 1 mH Destruction limits against externally applied voltages and currents voltages at the output stowards MANA 16 V Casile length sheleled, max. as allow to correnge (bit including sign), max. 16 bit Setting time for capacitive load for		-
• for voltage output tow-wire connection Yes • for voltage output tow-wire connection Yes • for current outputs, min. 1 kΩ • with voltage outputs, capacitive load, max. 1 μF • with current outputs, max. 500 Ω • with current outputs gapaint externing appendent load, max. 10 H • Statucton limits against externing appendent load, max. 16 V • Status gapaint externing appendent load, max. 16 N • for resistive load 1 ms • for resistive load 1 ms<		Yes; 14 bit
e for vallage output four-wire connection Yes i for current output four-wire connection Yes Load impedance in rated range of output I kD with voltage outputs, nin, 1 kD with voltage outputs, inductive load, max. 1 μF with outputs, inductive load, max. 1 mB Destruction limits against externally applied voltages and currents. • Voltages at the outputs towards MANA 16 V Cable length • Voltages at the outputs towards MANA 16 V Cable length • Voltages at the outputs towards MANA 16 V Cable length • Voltages at the outputs towards MANA 16 V Cable length • Voltages at the outputs towards MANA 16 V Cable length • Voltages at the outputs towards MANA 16 V Cable ingth • Voltages class		
• for current output tou-wire connection Yes Load impedance (in rated range of output) • With voltage outputs, capacitive load, max. 1 k0 • with outrage outputs, capacitive load, max. 1 µF • with outrent outputs, mitorive load, max. 500 0 • with outrent outputs, mitorive load, max. 1 µF • with outrent outputs, mitorive load, max. 1 µF • with outrent outputs, mitorive load, max. 1 µF • Voltages at the outputs towards MNNA 16 V • Cable length • • Notages at the outputs towards MNNA 16 V • Resolution with overrange (bit including sign), max. 16 bit • For resistive load 1 ms • for resistive load 1 ms • for resistive load 1 ms • for inductive load 0.02 % Mt2), (/s/) 0.005 %/K Consistive lead 0.005 %/K Consistive lead 0.005 %/K Consistive leade the output range, (+/) 0.05 %/K Consistive leader the output range, (+/) 0.05 %/K Operature error (intell moverall temperature arroge • •	 for voltage output two-wire connection 	Yes
• of current output four-wire connection Yes Load impedance (in rated range of output) • with voltage outputs, min. 1 kΩ • with voltage outputs, min. 1 μF • with outputs, inductive load, max. 1 μF • with ourment outputs, max. 500 Ω • with ourment outputs, inductive load, max. 1 mH Destruction limits against externally applied voltages and currents • Voltages at the outputs towards MANA 16 V Cable length • Shelded, max. 30 m Analog yulus generation for the outputs • Integration and conversion limit/resolution per channel • For espisitive load 1 ms • for respisitive load 1 ms • for craspitive load 1 ms • for respisitive load 1 ms • for craspitive load 1 ms • for respisitive load 1 ms • for craspitive load 1 ms • for respisitive load 1 ms • for craspitive load 1 ms • for respisitive load 1 ms • for craspitive load 0.02 % • Linearity error (relative to output range, (+/-) 0.1 % • Crosstalk between the output range, (+/-) 0.03 % • Ovoltage, relative to output range,	 for voltage output four-wire connection 	Yes
Load impedance (in rated range of output) 1 KΩ • with voltage outputs, capacitive load, max. 1 μF • with ourment outputs, inductive load, max. 1 μF • with ourment outputs, inductive load, max. 1 μF • with ourment outputs, inductive load, max. 1 mH Destruction limits against externally applied voltages and currents • Voltages at the outputs towards MANA • Voltages at the outputs towards MANA 16 V • The standard externally applied voltages and currents • Voltages at the outputs • voltages at the outputs towards MANA 16 V • For advice generation for the outputs 16 bit • for resistive load 1 ms • for inductive load 1 ms • for inductive load 1 ms • for inductive load 0.02 % • (tri) 0.02 % • (tri) 0.03 % • (tri) 0.1 % • Temperature error (relative to output range, (tri) 0.03 % • Output range, (tri) 0.05 %/K • Corrent celative to output range, (tri) <td> for current output two-wire connection </td> <td>Yes</td>	 for current output two-wire connection 	Yes
• with voltage outputs, min. 1 k0 • with voltage outputs, capacitive load, max. 1 μF • with current outputs, max. 500 Ω • with current outputs, inductive load, max. 1 mH • Oblages at the outputs towards MANA 16 V • Shelded, max. 30 m • Analog vulue generation for the outputs 30 m Analog vulue generation for the outputs 30 m Integration and conversion time/resolution gene channel • • For resistive load 1 ms • for capacitive load 1 ms • for inductive load 1 ms • for inductive load 1 ms • for inductive load 1 ms • for capacitive load 1 ms • for capacitive load 1 ms • for inductive load 0.02 %	 for current output four-wire connection 	Yes
• with voltage outputs, capacitive load, max. 1 μF • with current outputs, inductive load, max. 1 mH Destruction limits against externally applied voltages and currents • Voltages at the outputs towards MANA 16 V Cable length • voltage generation for the outputs 30 m Analog value generation for the outputs 16 bit Setting time • for capacitive load • for resistive load 1 ms • for resistive load 1 ms • for inductive load 0.02 % Value, irright (relative to output range), (+/) 0.1 % • Temperature error (relative to output range), (+/) 0.05 %/k • Crosstalk between the output range, (+/) 0.25 % from 55 °C to -25 °C and 0.35 % to -30 °C • Output range, (+/) 0.25 % from 55 °C to -25 °C and 0.35 % to -30 °C • Output range, (+/) 0.15 % • Curre	Load impedance (in rated range of output)	
• with current outputs, inductive load, max. 500 0 • with current outputs, inductive load, max. 1 mH • Orlingse at the outputs towards MANA 16 V • Cable length 30 m • Analog value generation for the outputs Intervalue • Resolution with overrange (bit including sign), max. 16 bit • For capacitive load 1 ms • for inductive load 1 ms • for capacitive load 1 ms • for inductive load 1 ms • for capacitive load 1 ms • for inductive load 1 ms • for inductive load 1 ms • Carcent inter for induction and ins int at 25 °C 0.02 % • Carcent inter for induction ange, (+	 with voltage outputs, min. 	1 kΩ
• with current outputs, inductive load, max. 1 mH Destruction limits against externally applied voltages and currents • Voltages at the outputs towards MANA Gable length 50 • shelded, max. 30 m Analog value generation for the outputs 16 bit • Resolution with overrange (bit including sign), max. 16 bit • Resolution with overrange (bit including sign), max. 16 bit • for resistive load 1 ms • for resolutive load 1 ms • for resolutive load 1 ms • for inductive load 0.02 %/k • forestak beween	 with voltage outputs, capacitive load, max. 	1 µF
Destruction limits against externally applied voltages and currents • Voltages at the outputs towards MANA 16 V Cable length • • shielded, max. 30 m Analog value generation for the outputs • Integration and conversion time/resolution per channel • • for resistive load 1 ms • for resistive load 1 ms • for repactive load 0.02 % Linearity error (relative to output range), (+/-) 0.1 % Crosstalk between the output range), (+/-) 0.005 %K Crosstalk between the output range, (+/-) 0.005 %K Crosstalk between the output range, (+/-) 0.03 % • Voltage, (relative to output range, (+/-) 0.25 % • Voltage, (relative to output range, (+/-) 0.25 % • Voltage, relative to output range, (+/-) 0.25 % • Voltage, relative to output range, (+/-) 0.25 % • Voltage, relative to output range, (+/-) 0.25 % • Voltage, relative to output range, (+/-) 0.15 % • Vortage, relative to output range,	 with current outputs, max. 	500 Ω
Voltages at the outputs towards MANA 16 V Cable length shelded, max. 30 m Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. 16 bit Setting time for resistive load 1 ms for inductive load for more fill the output range, (+/-) 0.1 % Temperature error (relative to output range), (+/-) 0.03 % Output range, (+/-) 0.25 % from 55 °C to -25 °C and 0.35 % to -30 °C output range, (+/-) 0.25 % form s55 °C to -25 °C and 0.35 % to -30 °C output range, (+/-) 0.15 % current, relative to output range, (+/-) 0.15 % current, relative to output range, (+/-) 0.15 % current, relative to output range, (+/-) 0.15 % forterstippostice/status for output range, (+/-) output for output range, (+/-) for % forterstippostice/status for output range, (+/-) for % forterstippostice/status for output ra	 with current outputs, inductive load, max. 	1 mH
Cable length 30 m • shielded, max. 30 m Analog value generation for the outputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. 16 bit Setting time • for respisitive load 1 ms • for capacitive load 1 ms • for inductive load 1 ms • for inductive load 0.02 % Khzb, (+/-) 0.1 % Chemperature error (relative to output range, (+/-) 0.1005 %/K Crosstalk between the outputs, max. -70 dB Repeat accuracy in steady state at 25 °C (relative to output range, (+/-) 0.25 % from 55 °C to -25 °C and 0.35 % to -30 °C • Vortage, relative to output range, (+/-) 0.25 % Poterational error limit in overall temperature range •Vortage, relative to output range, (+/-) • Vortage, relative to output range, (+/-) 0.25 % Basic error limit (operational limformation Use the output range, (+/-) • Vortage, relative to output range, (+/-) 0.15 % • Vortage, relative to output range, (+/-) 0.15 % • Vortage, relative to output range, (+/-) 0.15 % • Vortage 0.1	Destruction limits against externally applied voltages and cur	rents
• shielded, max. 30 m Analog value generation for the outputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. 16 bit Setting time • for resistive load 1 ms • for resistive load 1 ms • for resistive load 1 ms • for inductive load 1 ms • for inductive load 1 ms Entrosistic relative to output range, bandwidth 0 to 50 0.02 % 0.005 %/K/L Output ripple (relative to output range), (+/-) 0.1 % 0.005 %/K/L Temperature error (relative to output range), (+/-) 0.1 % 0.005 %/K/L Crosstak between the output range, (+/-) 0.03 % 0.03 % output range), (+/-) 0.25 % from 55 °C to -25 °C and 0.35 % to -30 °C 0.00 °C • Voltage, relative to output range, (+/-) 0.25 % 0.05 % Basic error limit in overall temperature range • Voltage, relative to output range, (+/-) 0.25 % Substitute values connectable Yes; channel by channel, parameterizable No Substitute values connectable Yes; channel by channel, only for output type "current" • Diagno	 Voltages at the outputs towards MANA 	16 V
Analog value generation for the outputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. 16 bit Setting time • for resistive load 1 ms • for capacitive load 1 ms • for inductive load 1 ms • for inductive load 1 ms • for inductive load 0.02 % • thit, (r/-) 0.1 % Cutput ripple (relative to output range), (r/-) 0.05 %/K Crosstalk between the outputs, max. -70 dB Repeat accuracy in steady state at 25 °C (relative to output range), (r/-) 0.03 % Output ringle, (r/-) 0.25 % from 55 °C to -25 °C and 0.35 % to -30 °C • Voltage, relative to output range, (r/-) 0.25 % Basic error limit (operational limit at 25 °C) • Voltage, relative to output range, (r/-) • Voltage, relative to output range, (r/-) 0.15 % • Voltage, relative to output range, (r/-) 0.15 % • Voltage, relative to output range, (r/-) 0.15 % • Voltage, relative to output range, (r/-) 0.15 % • Voltage, relative to output range, (r/-) 0.15 % • Diagnostic alarm Yes; channel	Cable length	
Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. 16 bit Settling time 1 ms • for resistive load 1 ms • for inductive load 1 ms • for inductive load 1 ms Errors/accuracies 0.02 % Output ripple (relative to output range, bandwidth 0 to 50 k/k/s 0.02 % Temperature error (relative to output range), (+/-) 0.1 % Temperature error (relative to output range), (+/-) 0.05 %/k Crosstal between the output range, (+/-) 0.05 %/k Operational error limit in overall temperature range 0.02 % • Voltage, relative to output range, (+/-) 0.25 % from 55 °C to -25 °C and 0.35 % to -30 °C • Current, relative to output range, (+/-) 0.25 % Basic error limit (operational limit at 25 °C) • 0.25 % • Voltage, relative to output range, (+/-) 0.15 % • Voltage, relative to output range, (+/-) 0.15 % • Voltage, relative to output range, (+/-) 0.15 % • Unterrupts/diagnostics/status information Substitute values connectable Ves: channel by channel, parameterizable No Diagnostics indication LED Ve	• shielded, max.	30 m
Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. 16 bit Settling time 1 ms • for resistive load 1 ms • for inductive load 1 ms • for inductive load 1 ms Errors/accuracies 0.02 % Output ripple (relative to output range, bandwidth 0 to 50 k/k/s 0.02 % Temperature error (relative to output range), (+/-) 0.1 % Temperature error (relative to output range), (+/-) 0.05 %/k Crosstal between the output range, (+/-) 0.05 %/k Operational error limit in overall temperature range 0.02 % • Voltage, relative to output range, (+/-) 0.25 % from 55 °C to -25 °C and 0.35 % to -30 °C • Current, relative to output range, (+/-) 0.25 % Basic error limit (operational limit at 25 °C) • 0.25 % • Voltage, relative to output range, (+/-) 0.15 % • Voltage, relative to output range, (+/-) 0.15 % • Voltage, relative to output range, (+/-) 0.15 % • Unterrupts/diagnostics/status information Substitute values connectable Ves: channel by channel, parameterizable No Diagnostics indication LED Ve	Analog value generation for the outputs	
• Resolution with overrange (bit including sign), max. 16 bit Setting time • for resistive load 1 ms • for capacitive load 1 ms 1 ms • for inductive load 1 ms 0.02 % Linearity error (relative to output range), (+/-) 0.1 % 0.05 %/K Crosstalk between the outputs, max. -70 dB 0.03 % Repeat accuracy in steady state at 25 °C (relative to output range), (+/-) 0.25 % from 55 °C to -25 °C and 0.35 % to -30 °C • Voltage, relative to output range, (+/-) 0.25 % 0.25 % Basic error limit (porerational limit at 25 °C) • Voltage, relative to output range, (+/-) 0.15 % • Voltage, relative to output range, (+/-) 0.15 % • Corest, relative to output range, (+/-) 0.15 % • Voltage, relative to output range, (+/-) 0.15 % • Corest, relative to output range, (+/-) 0.15 % • Voltage, relative to output range, (+/-) 0.15 % • Corest, relative to output range, (+/-) 0.15 % • Voltage, relative to output range, (+/-) 0.15 % • Corest,		
Settling time for resistive load for resistive load for apacitive load for inductive load for inducti load for inducti load<td>6</td><td>16 bit</td>	6	16 bit
• for resistive load 1 ms • for capacitive load 1 ms • for capacitive load 1 ms Errors/accuracies 0.000 % Output ripple (relative to output range, bandwidth 0 to 50 k/tz), (+/-) 0.1 % Linearity error (relative to output range), (+/-) 0.1 % Temperature error (relative to output range), (+/-) 0.005 %/K Crosstalk between the outputs, max. -70 dB Repeat accuracy in steady state at 25 °C (relative to output range), (+/-) 0.25 % from 55 °C to -25 °C and 0.35 % to -30 °C Output range), (+/-) 0.25 % from 55 °C to -26 °C and 0.35 % to -30 °C 0.26 % Poerational error limit in overall temperature range • 0.015 % Current, relative to output range, (+/-) 0.15 % 0.15 % Current, relative to output range, (+/-) 0.15 % 1015 % Interrupts/diagnostics/status information Substitute values connectable Yes; channel by channel, parameterizable Alarms Diagnostic alarm Yes; channel-by-channel, only for output type "current" • Short-circuit Yes; green LED Yes; green LED Potential separation Diagnossits Yes; green/red		
• for capacitive load 1 ms • for inductive load 1 ms Errors/accuracies 0.02 % KHzb, (+/-) 0.1 % Linearity error (relative to output range), (+/-) 0.1 % Temperature error (relative to output range), (+/-) 0.005 %/K Crosstalk between the outputs, max. -70 dB Repeat accuracy in steady state at 25 °C (relative to output range), (+/-) 0.03 % Operational error limit in overall temperature range • Voltage, relative to output range, (+/-) • Voltage, relative to output range, (+/-) 0.25 % from 55 °C to -25 °C and 0.35 % to -30 °C • Operational error limit in overall temperature range • Voltage, relative to output range, (+/-) • Current, relative to output range, (+/-) 0.25 % • Current, relative to output range, (+/-) 0.15 % Interrupts//diagnostics/status information Substitute values connectable Yes; channel by channel, parameterizable Parameterizable Diagnostic alarm Yes; Parameterizable Diagnostic alarm Yes; reannel by channel, only for output type "current" • Nire-break Yes; green LED • Channel status display Yes; green LED • for module diagnostics Yes		1 ms
• for inductive load 1 ms Errors/accuracies 0.02 % Output ripple (relative to output range, bandwidth 0 to 50 0.02 % Linearity error (relative to output range), (+/-) 0.1 % Temperature error (relative to output range), (+/-) 0.05 %/K Crosstalk between the outputs, max. -70 dB Repeat accuracy in steady state at 25 °C (relative to output range), (+/-) 0.03 % Operational error limit in overall temperature range • Voltage, relative to output range, (+/-) Operational error limit in overall temperature range • Voltage, relative to output range, (+/-) • Voltage, relative to output range, (+/-) 0.25 % from 55 °C to -25 °C and 0.35 % to -30 °C • Current, relative to output range, (+/-) 0.15 % • Current, relative to output range, (+/-) 0.15 % • Current, relative to output range, (+/-) 0.15 % Interrupts/diagnostics/status information Yes; channel by channel, parameterizable Substitute values connectable Yes; channel-by-channel, only for output type "current" • Diagnostic alarm Yes; preanterizable Diagnostics indication LED Yes; green LED • Channel status display Yes; green LED		
Errors/accuracies 0.02 % Output ripple (relative to output range, bandwidth 0 to 50 kHz), (+/-) 0.1 % Linearity error (relative to output range), (+/-) 0.1 % Crosstalk between the outputs, max. -70 dB Repeat accuracy in steady state at 25 °C (relative to output range), (+/-) 0.03 % Output range), (+/-) 0.25 % from 55 °C to -25 °C and 0.35 % to -30 °C Output range, (+/-) 0.25 % Output range, relative to output range, (+/-) 0.25 % Output range, relative to output range, (+/-) 0.25 % Output relative to output range, (+/-) 0.25 % Voltage, relative to output range, (+/-) 0.25 % Voltage, relative to output range, (+/-) 0.15 % - Current, relative to output range, (+/-) 0.15 % - Uurrent, relative to output range, (+/-) 0.15 % - Uurrent, relative to output range, (+/-) 0.15 % - Current, relative to output range, (+/-) 0.15 % - Diagnostic alarm Yes; Parameterizable Diagnostic alarm Yes; channel by channel, parameterizable Diagnostic indication LED - - Channel status display Yes; green LED	•	
Output ripple (relative to output range, bandwidth 0 to 50 0.02 % KHz), (+/-) 0.1 % Temperature error (relative to output range), (+/-) 0.005 %/K Crosstalk between the outputs, max. -70 dB Repeat accuracy in steady state at 25 °C (relative to output range), (+/-) 0.03 % Operational error limit in overall temperature range 0.02 % • Voltage, relative to output range, (+/-) 0.25 % from 55 °C to -25 °C and 0.35 % to -30 °C Basic error limit (operational limit at 25 °C) 0.15 % • Voltage, relative to output range, (+/-) 0.15 % • Current, relative to output range, (+/-) 0.15 % • Lurrent, relative to output range, (+/-) 0.15 % • Lurrent, relative to output range, (+/-) 0.15 % • Lurrent, relative to output range, (+/-) 0.15 % • Lurent, relative to output range, (+/-) 0.15 % • Usingnostic alarm Yes; Parameterizable Diagnoses Yes; channel by channel, parameterizable Diagnoses Yes; Actuator supply module by module; channel for output type "voltage" Diagnostics indication LED Yes; green LED • Channel status display Yes; green LED Potential separation Yes </td <td></td> <td>1 110</td>		1 110
kHz), (+/-) 0.1 % Temperature error (relative to output range), (+/-) 0.005 %/K Crosstalk between the outputs, max. -70 dB Repeat accuracy in steady state at 25 °C (relative to output range), (+/-) 0.03 % Operational error limit in overall temperature range 0.25 % from 55 °C to -25 °C and 0.35 % to -30 °C Operational error limit in overall temperature range 0.15 % • Voltage, relative to output range, (+/-) 0.25 % Basic error limit (operational limit at 25 °C) • Voltage, relative to output range, (+/-) • Voltage, relative to output range, (+/-) 0.15 % • Current, relative to output range, (+/-) 0.15 % • Current, relative to output range, (+/-) 0.15 % • Current, relative to output range, (+/-) 0.15 % • Current, relative to output range, (+/-) 0.15 % • Current, relative to output range, (+/-) 0.15 % Interrupts/diagnostics/status information Substitute values connectable Yes; channel by channel, parameterizable Diagnoses • Wire-break Yes; channel-by-channel, only for output type "current" • Short-circuit Yes; green LED • Channel status display Yes; green LED • for module d		0.00.0/
Temperature error (relative to output range), (+/-) 0.005 %/K Crosstalk between the outputs, max. -70 dB Repeat accuracy in steady state at 25 °C (relative to output range), (+/-) 0.03 % Operational error limit in overall temperature range 0.03 % • Voltage, relative to output range, (+/-) 0.25 % from 55 °C to -25 °C and 0.35 % to -30 °C • Current, relative to output range, (+/-) 0.25 % Basic error limit (operational limit at 25 °C) • Voltage, relative to output range, (+/-) • Voltage, relative to output range, (+/-) 0.15 % • Voltage, relative to output range, (+/-) 0.15 % • Current, relative to output range, (+/-) 0.15 % • Otagonostics/status information Substitute values connectable Alarms • • Diagnostic alarm Yes; channel by channel, parameterizable Diagnostic status Yes; channel-by-channel, only for output type "current" • Short-circuit Yes; green LED • Channel status display Yes; green LED • for module diagnostics Yes; green LED • between the channels Yes • between the channels No • between the channels and backplane bus Yes	kHz), (+/-)	
Crosstalk between the outputs, max. -70 dB Repeat accuracy in steady state at 25 °C (relative to output range), (+/-) 0.03 % Operational error limit in overall temperature range 0.03 km output range, (+/-) • Voltage, relative to output range, (+/-) 0.25 % from 55 °C to -25 °C and 0.35 % to -30 °C • Current, relative to output range, (+/-) 0.25 % Basic error limit (operational limit at 25 °C) • Voltage, relative to output range, (+/-) • Voltage, relative to output range, (+/-) 0.15 % • Current, relative to output range, (+/-) 0.15 % • Current, relative to output range, (+/-) 0.15 % • Current, relative to output range, (+/-) 0.15 % • Substitute values connectable Yes; channel by channel, parameterizable Alarms Yes; Channel-by-channel, only for output type "current" • Diagnostic alarm Yes; Actuator supply module by module; channel for output type "current" • Short-circuit Yes; green LED • Channel status display Yes; green LED • for module diagnostics Yes; green LED • between the load voltages Yes • between the channels No • between the channels and backplane bus Yes • be		
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-) 0.03 % Operational error limit in overall temperature range 0.25 % from 55 °C to -25 °C and 0.35 % to -30 °C • Voltage, relative to output range, (+/-) 0.25 % Basic error limit (operational limit at 25 °C) 0.15 % • Voltage, relative to output range, (+/-) 0.15 % • Current, relative to output range, (+/-) 0.15 % • Voltage, relative to output range, (+/-) 0.15 % • Current, relative to output range, (+/-) 0.15 % • Current, relative to output range, (+/-) 0.15 % Interrupts/diagnostics/status information Substitute values connectable Alarms • Diagnostic alarm Yes; channel by channel, parameterizable Diagnoses • Wire-break Yes; channel-by-channel, only for output type "current" • Short-circuit Yes; green LED • Channel status display Yes; green LED • for module diagnostics Yes; green LED Potential separation between the channels No • between the channels and backplane bus Yes • between the channels and backplane bus Yes	Temperature error (relative to output range), (+/-)	0.005 %/K
output range), (+/-) Operational error limit in overall temperature range • Voltage, relative to output range, (+/-) 0.25 % from 55 °C to -25 °C and 0.35 % to -30 °C • Current, relative to output range, (+/-) 0.25 % Basic error limit (operational limit at 25 °C) • • Voltage, relative to output range, (+/-) 0.15 % • Current, relative to output range, (+/-) 0.15 % Interrupts/diagnostics/status information Substitute values connectable Yes; channel by channel, parameterizable Alarms - • Diagnostic alarm Yes; Parameterizable Diagnoses - • Wire-break Yes; channel-by-channel, only for output type "current" • Short-circuit Yes; green LED • for module diagnostics Yes; green LED • for module diagnostics Yes; green LED • for module diagnostics Yes Potential separation - between the load voltages Yes Potential separation channels No • between the channels and backplane bus Yes • between the channels and backplane bus Yes • between the channels and the power supply of the electronics <td< td=""><td>Crosstalk between the outputs, max.</td><td>-70 dB</td></td<>	Crosstalk between the outputs, max.	-70 dB
 Voltage, relative to output range, (+/-) 0.25 % from 55 °C to -25 °C and 0.35 % to -30 °C Current, relative to output range, (+/-) 0.25 % Basic error limit (operational limit at 25 °C) Voltage, relative to output range, (+/-) 0.15 % Current, relative to output range, (+/-) 0.15 % Interrupts/diagnostics/status information Substitute values connectable Yes; channel by channel, parameterizable Alarms Diagnostic alarm Yes; channel-by-channel, only for output type "current" Short-circuit Yes; channel-by-channel, only for output type "current" Yes; Actuator supply module by module; channel for output type "voltage" Diagnostics indication LED Channel status display Yes; green LED Yes; green/red LED Potential separation between the channels between the channels and backplane bus between the channels and backplane bus between the channels and backplane bus between the channels and the power supply of the electronics 		0.03 %
Current, relative to output range, (+/-) O.25 % Basic error limit (operational limit at 25 °C) Voltage, relative to output range, (+/-) O.15 % Current, relative to output range, (+/-) O.15 % Interrupts/diagnostics/status information Substitute values connectable Alarms Diagnostic alarm Yes; Parameterizable Diagnoses Wire-break Yes; channel by channel, parameterizable Diagnoses Vire-break Yes; channel-by-channel, only for output type "current" Yes; Actuator supply module by module; channel for output type "voltage" Diagnostics indication LED Channel status display Yes; green LED Yes; green LED Yes; green LED between the load voltages Yes Potential separation between the channels between the channels between the channels and the power supply of the electronics	Operational error limit in overall temperature range	
Basic error limit (operational limit at 25 °C) • Voltage, relative to output range, (+/-) 0.15 % • Current, relative to output range, (+/-) 0.15 % Interrupts/diagnostics/status information Substitute values connectable Yes; channel by channel, parameterizable Alarms • Diagnostic alarm Yes; Parameterizable Diagnoses • Wire-break Yes; channel-by-channel, only for output type "current" • Short-circuit Yes; channel-by-channel, only for output type "current" • Short-circuit Yes; actuator supply module by module; channel by channel for output type "voltage" Diagnostics indication LED • Channel status display Yes; green LED • for module diagnostics Yes; green LED • for module diagnostics Yes Potential separation between the load voltages Yes Potential separation channels No • between the channels and backplane bus Yes • between the channels and the power supply of the electronics No	 Voltage, relative to output range, (+/-) 	0.25 % from 55 °C to -25 °C and 0.35 % to -30 °C
• Voltage, relative to output range, (+/-) 0.15 % • Current, relative to output range, (+/-) 0.15 % Interrupts/diagnostics/status information Substitute values connectable Yes; channel by channel, parameterizable Alarms • Diagnostic alarm Yes; Parameterizable Diagnoses • Wire-break Yes; channel-by-channel, only for output type "current" • Short-circuit Yes; channel-by-channel, only for output type "current" • Short-circuit Yes; actuator supply module by module; channel by channel for output type "voltage" Diagnostics indication LED	 Current, relative to output range, (+/-) 	0.25 %
Current, relative to output range, (+/-) 0.15 % Interrupts/diagnostics/status information Substitute values connectable Alarms Diagnostic alarm Ves; Parameterizable Diagnoses Wire-break Ves; channel-by-channel, only for output type "current" Ves; Actuator supply module by module; channel by channel for output type "voltage" Diagnostics indication LED Channel status display Ves; green LED Ves; green LED Ves; green/red LED Potential separation between the load voltages Ves Potential separation channels between the channels and backplane bus between the channels and backplane bus between the channels and backplane bus between the channels and the power supply of the electronics	Basic error limit (operational limit at 25 °C)	
Interrupts/diagnostics/status information Substitute values connectable Yes; channel by channel, parameterizable Alarms Diagnostic alarm Yes; Parameterizable Diagnoses Wire-break Short-circuit Yes; channel-by-channel, only for output type "current" Yes; Actuator supply module by module; channel by channel for output type "voltage" Diagnostics indication LED Channel status display Yes; green LED for module diagnostics Yes; green/red LED Potential separation between the load voltages Yes Potential separation channels between the channels and backplane bus between the channels and the power supply of the electronics No No<td> Voltage, relative to output range, (+/-) </td><td>0.15 %</td>	 Voltage, relative to output range, (+/-) 	0.15 %
Substitute values connectable Yes; channel by channel, parameterizable Alarms Diagnostic alarm Yes; Parameterizable Diagnoses Wire-break Short-circuit Yes; channel-by-channel, only for output type "current" Yes; Actuator supply module by module; channel by channel for output type "voltage" Diagnostics indication LED Channel status display Yes; green LED for module diagnostics Yes; green/red LED Potential separation between the load voltages Yes between the channels between the channels and backplane bus Yes between the channels and the power supply of the electronics No No Substitute values and the power supply of the electronics Alarma diamate and the power supply of the electronics	 Current, relative to output range, (+/-) 	0.15 %
Substitute values connectable Yes; channel by channel, parameterizable Alarms Diagnostic alarm Yes; Parameterizable Diagnoses Wire-break Short-circuit Yes; channel-by-channel, only for output type "current" Yes; Actuator supply module by module; channel by channel for output type "voltage" Diagnostics indication LED Channel status display Yes; green LED for module diagnostics Yes; green/red LED Potential separation between the load voltages Yes between the channels between the channels and backplane bus Yes between the channels and the power supply of the electronics No No Substitute values and the power supply of the electronics Alarma diamate and the power supply of the electronics		
Alarms Yes; Parameterizable Diagnoses • Wire-break • Wire-break Yes; channel-by-channel, only for output type "current" • Short-circuit Yes; Actuator supply module by module; channel by channel for output type "voltage" Diagnostics indication LED • Channel status display • Channel status display Yes; green LED • for module diagnostics Yes; green/red LED Potential separation Yes between the load voltages Yes • between the channels No • between the channels and backplane bus Yes • between the channels and backplane bus Yes • between the channels and the power supply of the electronics No		Yes; channel by channel, parameterizable
 Diagnostic alarm Yes; Parameterizable Diagnoses Wire-break Short-circuit Yes; Actuator supply module by module; channel by channel for output type "voltage" Diagnostics indication LED Channel status display for module diagnostics Yes; green LED Yes; green/red LED Potential separation Yes between the load voltages Yes between the channels between the channels and backplane bus between the channels and backplane bus Yes No between the channels and the power supply of the electronics 		
Diagnoses Yes; channel-by-channel, only for output type "current" • Wire-break Yes; channel-by-channel, only for output type "current" • Short-circuit Yes; Actuator supply module by module; channel by channel for output type "voltage" Diagnostics indication LED • Channel status display • Channel status display Yes; green LED • for module diagnostics Yes; green/red LED Potential separation between the load voltages Yes Potential separation channels No • between the channels and backplane bus Yes • between the channels and the power supply of the electronics No		Yes: Parameterizable
• Wire-break Yes; channel-by-channel, only for output type "current" • Short-circuit Yes; Actuator supply module by module; channel by channel for output type "voltage" Diagnostics indication LED • Channel status display • Channel status display Yes; green LED • for module diagnostics Yes; green/red LED Potential separation Yes between the load voltages Yes • between the channels No • between the channels and backplane bus Yes • between the channels and the power supply of the electronics No		
 Short-circuit Yes; Actuator supply module by module; channel by channel for output type "voltage" Diagnostics indication LED Channel status display Yes; green LED for module diagnostics Yes; green/red LED Potential separation between the load voltages Yes Potential separation channels between the channels and backplane bus Yes between the channels and backplane bus Yes No between the channels and the power supply of the electronics No 	5	Yes: channel-by-channel, only for output type "current"
Diagnostics indication LED Yes; green LED • Channel status display Yes; green LED • for module diagnostics Yes; green/red LED Potential separation Yes between the load voltages Yes Potential separation channels No • between the channels and backplane bus Yes • between the channels and backplane bus Yes • between the channels and the power supply of the electronics No		Yes; Actuator supply module by module; channel by channel for output
• Channel status display Yes; green LED • for module diagnostics Yes; green/red LED Potential separation between the load voltages Yes Potential separation channels Yes • between the channels No • between the channels and backplane bus Yes • between the channels and the power supply of the electronics No	Diagnostics indication LED	
• for module diagnostics Yes; green/red LED Potential separation Yes between the load voltages Yes Potential separation channels No • between the channels and backplane bus Yes • between the channels and backplane bus Yes • between the channels and the power supply of the electronics No		Yes: green LED
Potential separation between the load voltages Yes Potential separation channels No • between the channels No • between the channels and backplane bus Yes • between the channels and backplane bus Yes • between the channels and the power supply of the electronics No		
between the load voltages Yes Potential separation channels No • between the channels and backplane bus Yes • between the channels and backplane bus Yes • between the channels and the power supply of the electronics No	5	
Potential separation channels No • between the channels and backplane bus Yes • between the channels and the power supply of the electronics No		Vec
• between the channels No • between the channels and backplane bus Yes • between the channels and the power supply of the electronics No		res
between the channels and backplane bus Yes between the channels and the power supply of the electronics		
between the channels and the power supply of the electronics		
electronics		
Isolation		No
	Isolation	

Isolation tested with	707 V DC (type test)	
Degree and class of protection		
IP degree of protection	IP65/67	
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules	Yes; from FS04	
Highest safety class achievable for safety-related tripping of standard modules		
 Performance level according to ISO 13849-1 	PL d	
 Category according to ISO 13849-1 	Cat. 3	
• SIL acc. to IEC 62061	SIL 2	
Ambient conditions		
Ambient temperature during operation		
• min.	-30 °C	
• max.	55 °C	
connection method / header		
Design of electrical connection for the inputs and outputs	M12, 5-pole	
Design of electrical connection for supply voltage	M8, 4-pole	
ET-Connection		
ET-Connection	M8, 4-pin, shielded	
Dimensions		
Width	30 mm	
Height	159 mm	
Depth	40 mm	
Weights		
Weight, approx.	175 g	
last modified:	3/7/2022 🖸	