## 6ES7313-5BF03-0AB0





\*\*\*Spare part\*\*\* SIMATIC S7-300, CPU 313C, Compact CPU with MPI, 24 DI/16 DO, 4 AI, 2 AO, 1 Pt100, 3 high-speed counters (30 kHz), Integr. power supply 24 V DC, work memory 64 KB, Front connector (2x 40-pole) and Micro Memory Card required

General information	
HW functional status	01
Firmware version	V2.6
Engineering with	
Programming package	STEP 7 V5.3 SP2 or higher with HW update
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
external protection for power supply lines (recommendation)	Miniature circuit breaker, type C; min. 2 A; miniature circuit breaker type B, min. 4 A
Load voltage L+	
<ul> <li>Rated value (DC)</li> </ul>	24 V
<ul> <li>permissible range, lower limit (DC)</li> </ul>	20.4 V
<ul> <li>permissible range, upper limit (DC)</li> </ul>	28.8 V
Digital inputs	
— load voltage / at digital input / at DC / rated value	24 V
<ul> <li>Reverse polarity protection</li> </ul>	Yes
Digital outputs	
— Rated value (DC)	24 V
Reverse polarity protection	No
Analog outputs	
— load voltage / at analog output / at DC / rated value	24 V
<ul> <li>Reverse polarity protection</li> </ul>	Yes
Input current	
Current consumption (rated value)	700 mA
Current consumption (in no-load operation), typ.	150 mA
Inrush current, typ.	11 A
l²t	0.7 A <sup>2</sup> ·s
Digital inputs	
<ul> <li>from load voltage L+ (without load), max.</li> </ul>	70 mA
Digital outputs	
<ul> <li>from load voltage L+, max.</li> </ul>	100 mA
Power loss	
Power loss, typ.	14 W
Memory	
Work memory	
• integrated	64 kbyte
expandable	No
Load memory	

Diversity (MMAO)	V
• Plug-in (MMC)	Yes
<ul><li>Plug-in (MMC), max.</li></ul>	8 Mbyte
<ul> <li>Data management on MMC (after last programming), min.</li> </ul>	10 a
Backup	
• present	Yes; Guaranteed by MMC (maintenance-free)
without battery	Yes; Program and data
CPU processing times	103, 110gram and data
	0.1 00
for bit operations, typ.  for bit operations, max.	0.1 µs 0.2 µs
for word operations, typ.	0.2 μs
	·
for fixed point arithmetic, typ.	2 µs
for floating point arithmetic, typ.  CPU-blocks	3 µs
	4.004 (DDs EOs EDs) the manifestory purchase of leadable blacks and be
Number of blocks (total)	1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.
DB	
Number, max.	511; Number range: 1 to 511
• Size, max.	16 kbyte
FB	
Number, max.	1 024; Number range: 0 to 2047
• Size, max.	16 kbyte
FC	10 hbyto
Number, max.	1 024; Number range: 0 to 2047
• Size, max.	16 kbyte
OB	10 hayto
• Size, max.	16 kbyte
Number of free cycle OBs	1; OB 1
Number of time alarm OBs	1; OB 10
Number of delay alarm OBs	1; OB 20
Number of cyclic interrupt OBs	1; OB 35
Number of process alarm OBs	1; OB 40
Number of startup OBs	1; OB 100
Number of asynchronous error OBs	4; OB 80, 82, 85, 87
Number of synchronous error OBs	2; OB 121, 122
Nesting depth	2, 05 121, 122
per priority class	8
additional within an error OB	4
Counters, timers and their retentivity	•
S7 counter	
• Number	256
	230
Retentivity	Ven
— adjustable	Yes 8
— preset  Counting range	U
	0
— lower limit	999
— upper limit	<del>333</del>
IEC counter	Voc
• present	Yes
Type     Number	SFB Unlimited //imited only by PAM congeity)
Number  S7 times	Unlimited (limited only by RAM capacity)
S7 times	256
Number     Potentivity	256
Retentivity	Voc
— adjustable	Yes
— preset	No retentivity
Time range	40
— lower limit	10 ms
— upper limit	9 990 s
IEC timer	V
• present	Yes

<ul> <li>Type</li> </ul>	SFB
Number	Unlimited (limited only by RAM capacity)
Data areas and their retentivity	S. Inflitted (Inflited only by Activi capacity)
Retentive data area (incl. timers, counters, flags), max.	64 kbyte
Flag	o <del>u</del> ruyto
• Size, max.	256 byte
Retentivity available	Yes; MB 0 to MB 255
Retentivity available     Retentivity preset	MB 0 to MB 15
Number of clock memories	8; 1 memory byte
Data blocks	o, Thiemory byte
Retentivity adjustable	Yes; via non-retain property on DB
Retentivity adjustable     Retentivity preset	Yes
Local data	165
• per priority class, max.	510 byte
Address area	310 byte
I/O address area	
	1 khyta
• Inputs	1 kbyte
Outputs  Process image	1 kbyte
Process image	128 hyte
• Inputs	128 byte
Outputs  Default addresses of the integrated channels.	128 byte
Default addresses of the integrated channels	124.0 to 126.7
— Digital outputs	124.0 to 126.7
— Digital outputs	124.0 to 125.7
— Analog inputs	752 to 761
— Analog outputs	752 to 755
Digital channels	4.040
• Inputs	1 016
— of which central	1 016
• Outputs	1 008
— of which central	1 008
Analog channels	
• Inputs	253
— of which central	253
Outputs	250
— of which central	250
Hardware configuration	
Number of expansion units, max.	3
Number of DP masters	
• integrated	none
• via CP	4
Number of operable FMs and CPs (recommended)	
• FM	8
• CP, PtP	8
• CP, LAN	6
Rack	
• Racks, max.	4
Modules per rack, max.	8; In rack 3 max. 7
Time of day	
Clock	
<ul> <li>Hardware clock (real-time)</li> </ul>	Yes
<ul> <li>retentive and synchronizable</li> </ul>	Yes
Backup time	6 wk; At 40 °C ambient temperature
Deviation per day, max.	10 s
Operating hours counter	
Number	1
Number/Number range	0
Range of values	0 to 2^31 hours (when using SFC 101)
Granularity	1 h
• retentive	Yes; Must be restarted at each restart
	,

Cleak aunchronization	
Clock synchronization	Voo
• supported	Yes
• to MPI, master	Yes
• on MPI, device	Yes
• in AS, master	Yes
Digital inputs	04
Number of digital inputs	24
of which inputs usable for technological functions	12
integrated channels (DI)	24
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Number of simultaneously controllable inputs	
horizontal installation — up to 40 °C, max.	24
•	12
— up to 60 °C, max.  vertical installation	12
— up to 40 °C, max.	12
	12
Input voltage  Rated value (DC)	24 V
. ,	24 V -3 to +5V
• for signal "1"	
• for signal "1"	+15 to +30 V
Input current  • for signal "1", typ.	9 mA
	9 IIIA
Input delay (for rated value of input voltage) for standard inputs	
·	Voc: 0.1.10.2.12.115 mg
— parameterizable — Rated value	Yes; 0.1 / 0.3 / 3 / 15 ms 3 ms
for technological functions	31118
— at "0" to "1", max.	16 µs
Cable length	10 μ5
• shielded, max.	1 000 m; 100 m for technological functions
• unshielded, max.	600 m; for technological functions: No
for technological functions	out III, for technological functions. No
ioi teciniologicai idiletions	
— shielded may	100 m
— shielded, max.	100 m
— unshielded, max.	100 m not allowed
— unshielded, max.  Digital outputs	not allowed
— unshielded, max.  Digital outputs  Number of digital outputs	not allowed  16
— unshielded, max.  Digital outputs  Number of digital outputs  • of which high-speed outputs	not allowed  16 4
— unshielded, max.  Digital outputs  Number of digital outputs  • of which high-speed outputs  integrated channels (DO)	not allowed  16 4 16
— unshielded, max.  Digital outputs  Number of digital outputs  of which high-speed outputs  integrated channels (DO)  Short-circuit protection	not allowed  16 4 16 Yes; Clocked electronically
— unshielded, max.  Digital outputs  Number of digital outputs  of which high-speed outputs integrated channels (DO)  Short-circuit protection Response threshold, typ.	not allowed  16 4 16 Yes; Clocked electronically 1 A
— unshielded, max.  Digital outputs  Number of digital outputs  of which high-speed outputs integrated channels (DO)  Short-circuit protection  Response threshold, typ.  Limitation of inductive shutdown voltage to	not allowed  16 4 16 Yes; Clocked electronically 1 A L+ (-48 V)
— unshielded, max.  Digital outputs  Number of digital outputs  of which high-speed outputs  integrated channels (DO)  Short-circuit protection Response threshold, typ.  Limitation of inductive shutdown voltage to  Controlling a digital input	not allowed  16 4 16 Yes; Clocked electronically 1 A
— unshielded, max.  Digital outputs  Number of digital outputs  of which high-speed outputs integrated channels (DO)  Short-circuit protection Response threshold, typ.  Limitation of inductive shutdown voltage to  Controlling a digital input  Switching capacity of the outputs	not allowed  16 4 16 Yes; Clocked electronically 1 A L+ (-48 V) Yes
— unshielded, max.  Digital outputs  Number of digital outputs  of which high-speed outputs integrated channels (DO)  Short-circuit protection Response threshold, typ.  Limitation of inductive shutdown voltage to  Controlling a digital input  Switching capacity of the outputs on lamp load, max.	not allowed  16 4 16 Yes; Clocked electronically 1 A L+ (-48 V)
— unshielded, max.  Digital outputs  Number of digital outputs  of which high-speed outputs integrated channels (DO)  Short-circuit protection Response threshold, typ.  Limitation of inductive shutdown voltage to  Controlling a digital input  Switching capacity of the outputs on lamp load, max.  Load resistance range	not allowed  16 4 16 Yes; Clocked electronically 1 A L+ (-48 V) Yes
— unshielded, max.  Digital outputs  Number of digital outputs  of which high-speed outputs integrated channels (DO)  Short-circuit protection Response threshold, typ.  Limitation of inductive shutdown voltage to  Controlling a digital input  Switching capacity of the outputs on lamp load, max.  Load resistance range lower limit	not allowed  16 4 16 Yes; Clocked electronically 1 A L+ (-48 V) Yes  5 W
— unshielded, max.  Digital outputs  Number of digital outputs  of which high-speed outputs integrated channels (DO)  Short-circuit protection  Response threshold, typ.  Limitation of inductive shutdown voltage to  Controlling a digital input  Switching capacity of the outputs  on lamp load, max.  Load resistance range  lower limit  upper limit	not allowed  16 4 16 Yes; Clocked electronically 1 A L+ (-48 V) Yes
— unshielded, max.  Digital outputs  Number of digital outputs  of which high-speed outputs integrated channels (DO)  Short-circuit protection Response threshold, typ.  Limitation of inductive shutdown voltage to  Controlling a digital input  Switching capacity of the outputs on lamp load, max.  Load resistance range lower limit upper limit  Output voltage	not allowed  16 4 16 Yes; Clocked electronically 1 A L+ (-48 V) Yes  5 W  48 Ω 4 kΩ
— unshielded, max.  Digital outputs  Number of digital outputs  of which high-speed outputs integrated channels (DO)  Short-circuit protection Response threshold, typ.  Limitation of inductive shutdown voltage to  Controlling a digital input  Switching capacity of the outputs  on lamp load, max.  Load resistance range  lower limit upper limit  Output voltage  for signal "1", min.	not allowed  16 4 16 Yes; Clocked electronically 1 A L+ (-48 V) Yes  5 W
— unshielded, max.  Digital outputs  Number of digital outputs  of which high-speed outputs integrated channels (DO)  Short-circuit protection Response threshold, typ.  Limitation of inductive shutdown voltage to  Controlling a digital input  Switching capacity of the outputs  on lamp load, max.  Load resistance range  lower limit upper limit  Output voltage  for signal "1", min.  Output current	not allowed  16 4 16 Yes; Clocked electronically 1 A L+ (-48 V) Yes  5 W  48 Ω 4 kΩ
— unshielded, max.  Digital outputs  Number of digital outputs  of which high-speed outputs integrated channels (DO)  Short-circuit protection  Response threshold, typ.  Limitation of inductive shutdown voltage to  Controlling a digital input  Switching capacity of the outputs  on lamp load, max.  Load resistance range  lower limit  upper limit  Output voltage  for signal "1", min.  Output current  for signal "1" rated value	not allowed  16 4 16 Yes; Clocked electronically 1 A L+ (-48 V) Yes  5 W  48 Ω 4 kΩ  L+ (-0.8 V)
— unshielded, max.  Digital outputs  Number of digital outputs  of which high-speed outputs integrated channels (DO)  Short-circuit protection  Response threshold, typ.  Limitation of inductive shutdown voltage to  Controlling a digital input  Switching capacity of the outputs  on lamp load, max.  Load resistance range  lower limit  upper limit  Output voltage  for signal "1", min.  Output current  for signal "1" rated value  for signal "1" permissible range, min.	not allowed  16 4 16 Yes; Clocked electronically 1 A L+ (-48 V) Yes  5 W  48 Ω 4 kΩ  L+ (-0.8 V)
— unshielded, max.  Digital outputs  • of which high-speed outputs integrated channels (DO) Short-circuit protection • Response threshold, typ.  Limitation of inductive shutdown voltage to Controlling a digital input Switching capacity of the outputs • on lamp load, max.  Load resistance range • lower limit • upper limit Output voltage • for signal "1", min.  Output current • for signal "1" rated value • for signal "1" permissible range, min. • for signal "1" permissible range, max.	not allowed  16 4 16 Yes; Clocked electronically 1 A L+ (-48 V) Yes  5 W  48 Ω 4 kΩ  L+ (-0.8 V)  500 mA 5 mA 0.6 A
— unshielded, max.  Digital outputs  Number of digital outputs  of which high-speed outputs integrated channels (DO)  Short-circuit protection Response threshold, typ.  Limitation of inductive shutdown voltage to  Controlling a digital input  Switching capacity of the outputs  on lamp load, max.  Load resistance range  lower limit upper limit  upper limit  Output voltage  for signal "1", min.  Output current  for signal "1" rated value for signal "1" permissible range, min.  for signal "1" permissible range, max.  for signal "1" minimum load current	not allowed  16 4 16 Yes; Clocked electronically 1 A L+ (-48 V) Yes  5 W  48 Ω 4 kΩ  L+ (-0.8 V)  500 mA 5 mA 0.6 A 5 mA
— unshielded, max.  Digital outputs  of which high-speed outputs integrated channels (DO)  Short-circuit protection Response threshold, typ.  Limitation of inductive shutdown voltage to  Controlling a digital input  Switching capacity of the outputs on lamp load, max.  Load resistance range Iower limit upper limit Output voltage of r signal "1", min.  Output current for signal "1" rated value of or signal "1" permissible range, min. of r signal "1" minimum load current of r signal "1" minimum load current of r signal "0" residual current, max.	not allowed  16 4 16 Yes; Clocked electronically 1 A L+ (-48 V) Yes  5 W  48 Ω 4 kΩ  L+ (-0.8 V)  500 mA 5 mA 0.6 A
— unshielded, max.  Digital outputs  of which high-speed outputs integrated channels (DO)  Short-circuit protection  Response threshold, typ.  Limitation of inductive shutdown voltage to  Controlling a digital input  Switching capacity of the outputs  on lamp load, max.  Load resistance range  lower limit  upper limit  Output voltage  for signal "1", min.  Output current  for signal "1" rated value  for signal "1" permissible range, min.  for signal "1" minimum load current  for signal "0" residual current, max.  Parallel switching of two outputs	16 4 16 Yes; Clocked electronically 1 A L+ (-48 V) Yes  5 W  48 Ω 4 kΩ L+ (-0.8 V)  500 mA 5 mA 0.6 A 5 mA 0.5 mA
— unshielded, max.  Digital outputs  Number of digital outputs  of which high-speed outputs integrated channels (DO)  Short-circuit protection  Response threshold, typ.  Limitation of inductive shutdown voltage to  Controlling a digital input  Switching capacity of the outputs  on lamp load, max.  Load resistance range  lower limit  upper limit  Output voltage  for signal "1", min.  Output current  for signal "1" rated value  for signal "1" permissible range, min.  for signal "1" minimum load current  for signal "0" residual current, max.  Parallel switching of two outputs  for uprating	not allowed  16 4 16 Yes; Clocked electronically 1 A L+ (-48 V) Yes  5 W  48 Ω 4 kΩ  L+ (-0.8 V)  500 mA 5 mA 0.6 A 5 mA 0.5 mA
— unshielded, max.  Digital outputs  Number of digital outputs  of which high-speed outputs integrated channels (DO)  Short-circuit protection  Response threshold, typ.  Limitation of inductive shutdown voltage to  Controlling a digital input  Switching capacity of the outputs  on lamp load, max.  Load resistance range  lower limit  upper limit  Output voltage  for signal "1", min.  Output current  for signal "1" permissible range, min.  for signal "1" permissible range, max.  for signal "1" minimum load current  for signal "0" residual current, max.  Parallel switching of two outputs  for redundant control of a load	16 4 16 Yes; Clocked electronically 1 A L+ (-48 V) Yes  5 W  48 Ω 4 kΩ L+ (-0.8 V)  500 mA 5 mA 0.6 A 5 mA 0.5 mA
— unshielded, max.  Digital outputs  Number of digital outputs  of which high-speed outputs integrated channels (DO)  Short-circuit protection  Response threshold, typ.  Limitation of inductive shutdown voltage to  Controlling a digital input  Switching capacity of the outputs  on lamp load, max.  Load resistance range  lower limit  upper limit  Output voltage  for signal "1", min.  Output current  for signal "1" permissible range, min.  for signal "1" permissible range, max.  for signal "1" minimum load current  for signal "0" residual current, max.  Parallel switching of two outputs  for redundant control of a load  Switching frequency	16 4 16 Yes; Clocked electronically 1 A L+ (-48 V) Yes  5 W  48 Ω 4 kΩ L+ (-0.8 V)  500 mA 5 mA 0.6 A 5 mA 0.5 mA  No Yes
— unshielded, max.  Digital outputs  Number of digital outputs  of which high-speed outputs integrated channels (DO)  Short-circuit protection  Response threshold, typ.  Limitation of inductive shutdown voltage to  Controlling a digital input  Switching capacity of the outputs  on lamp load, max.  Load resistance range  lower limit  upper limit  Output voltage  for signal "1", min.  Output current  for signal "1" permissible range, min.  for signal "1" permissible range, max.  for signal "1" minimum load current  for signal "0" residual current, max.  Parallel switching of two outputs  for redundant control of a load	not allowed  16 4 16 Yes; Clocked electronically 1 A L+ (-48 V) Yes  5 W  48 Ω 4 kΩ  L+ (-0.8 V)  500 mA 5 mA 0.6 A 5 mA 0.5 mA

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on lamp load, max.      of the pulse outputs, with registive load, may.	100 Hz
of the pulse outputs, with resistive load, max.  Total current of the outputs (nor group)	2.5 kHz
Total current of the outputs (per group)	
horizontal installation	2 A
— up to 40 °C, max.	3 A
— up to 60 °C, max.	2 A
vertical installation	
— up to 40 °C, max.	2 A
Cable length	4.000
• shielded, max.	1 000 m
• unshielded, max.	600 m
Analog inputs	
Number of analog inputs	
For voltage/current measurement	4
For resistance/resistance thermometer measurement	1
integrated channels (AI)	4+1
permissible input voltage for current input (destruction limit), max.	5 V; Permanent
permissible input voltage for voltage input (destruction limit), max.	30 V; Permanent
permissible input current for voltage input (destruction limit), max.	0.5 mA; Permanent
permissible input current for current input (destruction limit), max.	50 mA; Permanent
Electrical input frequency, max.	400 Hz
No-load voltage for resistance-type transmitter, typ.	2.5 V
Constant measurement current for resistance-type transmitter, typ.	1.8 to 3.3 mA
Technical unit for temperature measurement adjustable	Yes; Degrees Celsius / degrees Fahrenheit / Kelvin
Input ranges	
Current	Yes
<ul> <li>Resistance thermometer</li> </ul>	Yes; Pt 100 / 10 MΩ
Resistance	Yes
Input ranges (rated values), voltages	
• 0 to +10 V	Yes
— Input resistance (0 to 10 V)	100 kΩ
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
<ul><li>— Input resistance (0 to 20 mA)</li></ul>	100 Ω
• -20 mA to +20 mA	Yes
- Input resistance (-20 mA to +20 mA)	100 Ω
• 4 mA to 20 mA	Yes
— Input resistance (4 mA to 20 mA)	100 Ω
Input ranges (rated values), resistance thermometer	
• Pt 100	Yes
— Input resistance (Pt 100)	10 ΜΩ
Input ranges (rated values), resistors	
• 0 to 600 ohms	Yes
Input resistance (0 to 600 ohms)	10 ΜΩ
Thermocouple (TC)	
Temperature compensation	
— parameterizable	No
Characteristic linearization	
parameterizable	Yes; by software
— for resistance thermometer	Pt 100
Cable length	
shielded, max.	100 m
Analog outputs	
Number of analog outputs	2
integrated channels (AO)	2
	Yes
Voltage output, short-circuit protection	
Voltage output, short-circuit current, max.	55 mA

Current output, no-load voltage, max.	17 V
Output ranges, voltage	
• 0 to 10 V	Yes
• -10 V to +10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
Connection of actuators	
<ul> <li>for voltage output two-wire connection</li> </ul>	Yes; Without compensation of the line resistances
<ul> <li>for voltage output four-wire connection</li> </ul>	No
• for current output two-wire connection	Yes
Load impedance (in rated range of output)	
<ul><li>with voltage outputs, min.</li></ul>	1 kΩ
<ul> <li>with voltage outputs, capacitive load, max.</li> </ul>	0.1 μF
<ul><li>with current outputs, max.</li></ul>	300 Ω
<ul> <li>with current outputs, inductive load, max.</li> </ul>	0.1 mH
Destruction limits against externally applied voltages and currents	
Voltages at the outputs towards MANA	16 V; Permanent
• Current, max.	50 mA; Permanent
Cable length	
• shielded, max.	200 m
Analog value generation for the inputs	
Measurement principle	Actual value encryption (successive approximation)
Integration and conversion time/resolution per channel	,
Resolution with overrange (bit including sign), max.	12 bit
Integration time, parameterizable	Yes; 2,5 / 16,6 / 20 ms
Interference voltage suppression for interference	400 / 60 / 50 Hz
frequency f1 in Hz	
<ul> <li>Time constant of the input filter</li> </ul>	0.38 ms
<ul> <li>Basic execution time of the module (all channels</li> </ul>	1 ms
released)	
Analog value generation for the outputs	
Integration and conversion time/resolution per channel	
<ul> <li>Resolution with overrange (bit including sign), max.</li> </ul>	12 bit
Conversion time (per channel)	1 ms
Settling time	
for resistive load	0.6 ms
<ul> <li>for capacitive load</li> </ul>	1 ms
for inductive load	0.5 ms
Encoder	
Connection of signal encoders	
for voltage measurement	Yes
for current measurement as 2-wire transducer	Yes; with external supply
• for current measurement as 4-wire transducer	Yes
• for resistance measurement with two-wire connection	Yes; Without compensation of the line resistances
• for resistance measurement with three-wire connection	No
for resistance measurement with four-wire connection	No
Connectable encoders	
• 2-wire sensor	Yes
permissible quiescent current (2-wire sensor), max.	1.5 mA
Errors/accuracies	
Temperature error (relative to input range), (+/-)	0.006 %/K
Crosstalk between the inputs, min.	60 dB
Repeat accuracy in steady state at 25 °C (relative to input	0.06 %
range), (+/-)  Output ripple (relative to output range, bandwidth 0 to 50 kHz),	0.1 %
(+/-)	0.15.%
Linearity error (relative to output range), (+/-)	0.15 %
Temperature error (relative to output range), (+/-)	0.01 %/K
	CO 4D
Crosstalk between the outputs, min.  Repeat accuracy in steady state at 25 °C (relative to output	60 dB 0.06 %

range\ (II)	
range), (+/-)	
Operational error limit in overall temperature range	4.0/
<ul> <li>Voltage, relative to input range, (+/-)</li> </ul>	1 %
Current, relative to input range, (+/-)	1 %
• Resistance, relative to input range, (+/-)	5 %
<ul> <li>Voltage, relative to output range, (+/-)</li> </ul>	1 %
Current, relative to output range, (+/-)	1 %
Basic error limit (operational limit at 25 °C)	
<ul> <li>Voltage, relative to input range, (+/-)</li> </ul>	0.7 %; Linearity error ±0.06 %
<ul> <li>Current, relative to input range, (+/-)</li> </ul>	0.7 %; Linearity error ±0.06 %
<ul> <li>Resistance, relative to input range, (+/-)</li> </ul>	3 %; Linearity error ±0.2 %
<ul> <li>Resistance thermometer, relative to input range, (+/-)</li> </ul>	3 %
<ul> <li>Voltage, relative to output range, (+/-)</li> </ul>	0.7 %
Current, relative to output range, (+/-)	0.7 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference	erence frequency
Series mode interference (peak value of interference <	30 dB
rated value of input range), min.	40 dD
Common mode interference, min.  Interfaces.	40 dB
Interfaces	
Number of industrial Ethernet interfaces	0
Number of PROFINET interfaces	0
Number of RS 485 interfaces	1; MPI
Number of RS 422 interfaces	0
MPI	
Cable length, max.	50 m; without repeater
1. Interface	
Interface type	Integrated RS 485 interface
Isolated	No
Interface types	
• RS 485	Yes
Output current of the interface, max.	200 mA
Protocols	
• MPI	Yes
<ul> <li>PROFIBUS DP master</li> </ul>	No
<ul> <li>PROFIBUS DP device</li> </ul>	No
<ul> <li>Point-to-point connection</li> </ul>	No
MPI	
Number of connections	8
Transmission rate, max.	187.5 kbit/s
Services	
— PG/OP communication	Yes
— Routing	No
Global data communication	Yes
— S7 basic communication	Yes
— S7 communication	Yes
— S7 communication, as client	No
— S7 communication, as server	Yes
Protocols	
PROFIsafe	No
communication functions / header	
	Voc
PG/OP communication	Yes
Global data communication	Voc
• supported	Yes
Number of GD loops, max.	4
Number of GD packets, max.	4
<ul> <li>Number of GD packets, transmitter, max.</li> </ul>	4
<ul> <li>Number of GD packets, receiver, max.</li> </ul>	4
<ul><li>Number of GD packets, receiver, max.</li><li>Size of GD packets, max.</li></ul>	4 22 byte
•	
Size of GD packets, max.	22 byte

User data per job, max.	76 byte
<ul><li>User data per job, max.</li><li>User data per job (of which consistent), max.</li></ul>	76 byte; 76 bytes (with X_SEND or X_RCV); 64 bytes (with X_PUT or X_GET
- Oser data per job (or which consistent), max.	as server)
S7 communication	
• supported	Yes
• as server	Yes
• as client	Yes; Via CP and loadable FB
User data per job, max.	180 byte; With PUT/GET
User data per job (of which consistent), max.	64 byte
S5 compatible communication	,,
• supported	Yes; via CP and loadable FC
Number of connections	
overall	8
usable for PG communication	7
reserved for PG communication	1
adjustable for PG communication, min.	1
adjustable for PG communication, max.	7
usable for OP communication	7
reserved for OP communication	1
	1
adjustable for OP communication, min.	
— adjustable for OP communication, max.	7
usable for S7 basic communication	4
— reserved for S7 basic communication	0
<ul> <li>adjustable for S7 basic communication, min.</li> </ul>	0
<ul> <li>adjustable for S7 basic communication, max.</li> </ul>	4
usable for routing	No
S7 message functions	
Number of login stations for message functions, max.	8; Depending on the configured connections for PG/OP and S7 basic communication
Process diagnostic messages	Yes
simultaneously active Alarm-S blocks, max.	20
Fest commissioning functions	20
Status block	Yes
	Yes
Single step	
Number of breakpoints	2
Status/control	Ves
Status/control variable	Yes
• Variables	Inputs, outputs, memory bits, DB, times, counters
Number of variables, max.	30
— of which status variables, max.	30
— of which control variables, max.	14
Forcing	
<ul><li>Forcing</li></ul>	Yes
<ul><li>Forcing, variables</li></ul>	Inputs, outputs
Number of variables, max.	10
Diagnostic buffer	
• present	Yes
Number of entries, max.	100
nterrupts/diagnostics/status information	
Diagnostics indication LED	
<ul> <li>Status indicator digital input (green)</li> </ul>	Yes
<ul> <li>Status indicator digital output (green)</li> </ul>	Yes
ntegrated Functions	
Frequency measurement	Yes
Number of frequency meters	3; 3 channels up to max. 30 kHz (see "Technological Functions" manual)
controlled positioning	No
integrated function blocks (closed-loop control)	Yes; PID controller (see "Technological Functions" manual)
PID controller	Yes
Number of pulse outputs	3; 3 channels pulse width modulation up to max. 2.5 kHz (see "Technological
	o, o onarricio puise wight modulation up to max. 2.3 kHz (See Technological
Number of pulse outputs	Functions" manual)

Potential separation digital inputs  Potential separation digital inputs  Detween the channels and backplane bus  Potential separation digital outputs  Detween the channels and backplane bus  Potential separation digital outputs  Detween the channels and backplane bus  Potential separation digital outputs  Detween the channels, in groups of  Detween the channels, in groups of  Detween the channels and backplane bus  Potential separation analog inputs  Potential separation analog inputs  Potential separation analog inputs  Potential separation analog inputs  Potential separation analog outputs  Detween the channels and backplane bus  Potential separation analog outputs	Potential separation	
between the channels and backplane bus Yes Potential separation digital outputs Potential separation analog inputs Potential separation analog outputs Potential separation	Potential separation digital inputs	
between the channels and backplane bus Potential separation digital outputs     between the channels in groups of 8     between the channels, in groups of 8     between the channels in dackplane bus Potential separation analog inputs  Potential separation analog inputs  Potential separation analog inputs  Potential separation analog outputs  Potential separation analog outp	<ul> <li>Potential separation digital inputs</li> </ul>	Yes
Potential separation digital outputs  Potential separation digital outputs Potential separation digital outputs Potential separation and backplane bus Potential separation analog inputs Potential separation analog inputs Potential separation analog inputs Potential separation analog inputs Potential separation analog outputs Potential separation analog	• between the channels	No
Potential separation digital outputs between the channels between the channels between the channels in groups of between the channels and backplane bus between the channels and backplane bus between the channels Potential separation analog inputs between the channels between the c	<ul> <li>between the channels and backplane bus</li> </ul>	Yes
between the channels between the channels, in groups of between the channels and backplane bus  Potential separation analog inputs  Potential separation analog outputs  Potential separation analog ou	Potential separation digital outputs	
between the channels and backplane bus     between the channels and backplane bus     Potential separation analog inputs     Potential separation analog inputs     between the channels     between the channels and backplane bus     between the channels and backplane bus     between the channels and backplane bus     Potential separation analog outputs     Potential separation analog outputs     Potential separation analog outputs     Potential separation analog outputs     between the channels     No     between the channels and backplane bus     Potential separation analog outputs     between the channels and backplane bus     Potential separation analog outputs     No     Potential separation analog outputs     Potential separation analog outputs     No     Potential separation analog outputs     Potential separation analog outputs     No     Potential separation analog outputs     No	<ul> <li>Potential separation digital outputs</li> </ul>	Yes
● between the channels and backplane bus Potential separation analog inputs     ● Potential separation analog inputs     ● between the channels     ● between the channels     ● between the channels and backplane bus Potential separation analog outputs     ● between the channels     ● Potential separation analog outputs     ● between the channels     ● between the channels     ● between the channels     ● between the channels and backplane bus     ● between the channels and backplane bus     ● STEP 7     ■ STEP 7     ■ Yes; V5.3 SP2 with HW update     ● STEP 7     ○ Command set     ● Nesting levels     ● System functions (SFC)     ● see instruction list     ● Nesting levels     ● System function blocks (SFB)     ■ System function blocks (SFB)     ■ See instruction list Programming language     ● LAD     ■ FBD     ■ Yes     ● STL     ■ SCL     ■ GRAPH     ■ Yes     ■ STL     ■ SCL     ■ GRAPH     ■ HiGraph®  Know-how protection     ● User program protection/password protection     ■ User program protection/password protection     □ User program protection/password protection protection protection pr	• between the channels	Yes
Potential separation analog inputs  Potential separation analog inputs between the channels between the channels and backplane bus between the channels and backplane bus Potential separation analog outputs Potential separation analog outputs Potential separation analog outputs between the channels and backplane bus between the channels and backplane bus between the channels and backplane bus Potential separation analog outputs between the channels and backplane bus Potential separation analog outputs between the channels and backplane bus Potential separation analog outputs between the channels and backplane bus Potential separation analog outputs Potential separation a	<ul> <li>between the channels, in groups of</li> </ul>	8
Potential separation analog inputs between the channels between the channels and backplane bus Potential separation analog outputs Potential separation analog outputs Potential separation analog outputs between the channels between the channels between the channels between the channels and backplane bus Possiblation  Isolation tested with between the channels and backplane bus  Isolation tested with between the channels  Isolation tested with between the channels and backplane bus  Isolation tested with between the channels and backplane bus  Isolation tested with between the channels and backplane bus  Isolation tested with between the channels and backplane bus  Isolation tested with between the channels and backplane bus  Isolation tested with between the channels and backplane bus  Isolation tested with between the channels and backplane bus  Isolation  Isolation tested with between the channels and backplane bus  Isolation tested with between the channels and backplane bus  Isolation tested with between the channels and backplane bus  Isolation tested with between the channels and backplane bus  Isolation tested with between the channels and backplane bus  Isolation tested with between the channels and backplane bus  Isolation tested with between the channels and backplane bus  Isolation tested with between the channels and backplane bus  Isolation tested with between the channels and backplane bus  Isolation tested with between the channels and backplane bus  Isolation tested with between the channels and backplane bus  Isolation tested with between the channels and backplane bus  Isolation tested with  Isolation tested	<ul> <li>between the channels and backplane bus</li> </ul>	Yes
between the channels and backplane bus Yes  Potential separation analog outputs Potential separat	Potential separation analog inputs	
between the channels and backplane bus     Potential separation analog outputs     • Potential separation analog outputs     • between the channels     • between the channels and backplane bus     • between the channels and backplane bus     Station  Isolation  Isolation  Isolation tested with     600 V DC  configuration / header  Configuration / programming / header  • STEP 7 Yes; V5.3 SP2 with HW update  configuration / programming / header  • Command set     • Nesting levels     • System functions (SFC)     • see instruction list     • System function blocks (SFB)     * see instruction list  Programming language  — LAD     Yes — FBD — STL — SCL — GRAPH — HiGraph®     Yes  Know-how protection  • User program protection/password protection  • User program prote	Potential separation analog inputs	Yes; common for analog I/O
Potential separation analog outputs  Potential separation analog outputs between the channels between the channels and backplane bus  Isolation  Isolation tested with 600 V DC  configuration / header  Configuration / programming / header  Command set Nesting levels System functions (SFC) System function blocks (SFB) Programming language  — LAD — FBD — STL — SCL — GRAPH — HiGraph® — Resimplement — Higraph®  Ves  Know-how protection  User program protection/password protection  Ves  Ves  Nome  No  Yes  Nome  No  Yes  Nome  Nome Now protection  Ves  Nome Now protection  User program protection/password protection  Ves  Nome Nome Nome Nome Nome Nome Nome Nom	• between the channels	No
Potential separation analog outputs between the channels between the channels and backplane bus  Pes  Isolation  Isolation tested with configuration / header  Configuration / header  **Configuration / programming / header  **STEP 7 Yes; V5.3 SP2 with HW update configuration / programming / header  **Nesting levels** **Nesting levels** **System functions (SFC)** **System function blocks (SFB)** **Programming language**  - LAD - FBD - Yes - STL - SCL - SCL - GRAPH - HiGraph® Yes  Know-how protection  **User program protection/password protection  **User program protection/password protection  **User between the channels and backplane bus vesses instruction for analog I/O  No - STL - SCL - GRAPH - HiGraph® Yes  Know-how protection  **User program protection/password protection  **User program protection/password protection  **User program protection/password protection  **Dimensions**  Width - 120 mm  Height - Depth - 130 mm  Weights	<ul> <li>between the channels and backplane bus</li> </ul>	Yes
between the channels	Potential separation analog outputs	
between the channels and backplane bus  Isolation  Isolation tested with Configuration / header  Configuration / header  * STEP 7  * Yes; V5.3 SP2 with HW update  * Command set  * Nesting levels  * Nesting levels  * System functions (SFC)  * System function blocks (SFB)  * Programming language  LAD FBD STL SCL STL SCL GRAPH HiGraph® HiGraph® Wes  Know-how protection  * User program protection/password protection  * User program protection/password protection  Width L25 mm  Depth Bepth 125 mm  Depth 130 mm  Weights	<ul> <li>Potential separation analog outputs</li> </ul>	Yes; common for analog I/O
Isolation tested with 600 V DC  configuration / header  Configuration software  • STEP 7 Yes; V5.3 SP2 with HW update  configuration / programming / header  • Command set see instruction list • Nesting levels 8 Sesuinstruction list • System functions (SFC) see instruction list  Programming language  — LAD Yes — FBD Yes — STL Yes — SCL Yes — GRAPH Yes — HiGraph® Yes  Know-how protection  • User program protection/password protection  Width 120 mm  Height 125 mm  Depth 130 mm  Weights	• between the channels	No
Isolation tested with 600 V DC  configuration / header  Configuration software  • STEP 7 Yes; V5.3 SP2 with HW update  configuration / programming / header  • Command set see instruction list • Nesting levels 8 • System functions (SFC) see instruction list  • System function blocks (SFB) see instruction list  Programming language  — LAD Yes — FBD Yes — STL Yes — SCL Yes — GRAPH Yes — HiGraph® Yes  Know-how protection  • User program protection/password protection Yes  Dimensions  Width 120 mm  Height 125 mm  Depth 130 mm  Weights	<ul> <li>between the channels and backplane bus</li> </ul>	Yes
configuration / header           ● STEP 7         Yes; V5.3 SP2 with HW update           • Comfiguration / programming / header         see instruction list           • Command set         see instruction list           • Nesting levels         8           • System functions (SFC)         see instruction list           • System function blocks (SFB)         see instruction list           Programming language         ————————————————————————————————————	Isolation	
Configuration software         Yes; V5.3 SP2 with HW update           configuration / programming / header         see instruction list           • Command set         see instruction list           • Nesting levels         8           • System functions (SFC)         see instruction list           • System function blocks (SFB)         see instruction list           Programming language         Yes           — FBD         Yes           — STL         Yes           — SCL         Yes           — GRAPH         Yes           — HIGraph®         Yes           Know-how protection         Yes           • User program protection/password protection         Yes           Dimensions         Width         120 mm           Height         125 mm           Depth         130 mm	Isolation tested with	600 V DC
STEP 7  Configuration / programming / header  Command set  Nesting levels  System functions (SFC) System function blocks (SFB) System function blocks (SFB)  Programming language  LAD Yes - FBD Yes - STL Yes - SCL GRAPH - HiGraph® Yes - HiGraph®  Know-how protection User program protection/password protection  Width 120 mm  Height Depth  Weights	configuration / header	
configuration / programming / header         see instruction list           • Command set         see instruction list           • Nesting levels         8           • System functions (SFC)         see instruction list           • System function blocks (SFB)         see instruction list           Programming language         Yes           — LAD         Yes           — FBD         Yes           — STL         Yes           — SCL         Yes           — GRAPH         Yes           — HiGraph®         Yes           Know-how protection         Yes           • User program protection/password protection         Yes           Dimensions         Vidth           Height         120 mm           Height         125 mm           Depth         130 mm	Configuration software	
Command set  Nesting levels  System functions (SFC)  See instruction list  System function blocks (SFB)  Programming language  - LAD  - FBD  - FBD  - STL  - SCL  - GRAPH  - HiGraph®  Yes  Know-how protection  User program protection/password protection  Ves  Dimensions  Width  120 mm  Height  Depth  Meights	• STEP 7	Yes; V5.3 SP2 with HW update
Nesting levels     System functions (SFC)     See instruction list     System function blocks (SFB)     See instruction list  Programming language      — LAD     — Yes     — FBD     — Yes     — STL     — Yes     — SCL     — Yes     — GRAPH     — HiGraph®     Yes  Know-how protection      ■ User program protection/password protection  Width     Height     Depth     Depth  Depth  Nesseria instruction list see instruction	configuration / programming / header	
System functions (SFC) See instruction list System function blocks (SFB)  Programming language  - LAD - FBD - FBD - STL - SCL - SCL - GRAPH - HiGraph®  Know-how protection  User program protection/password protection  Width 120 mm  Height Depth 130 mm  Weights	<ul> <li>Command set</li> </ul>	see instruction list
● System function blocks (SFB)  Programming language  — LAD — FBD — FBD — Yes — STL — SCL — SCL — GRAPH — HiGraph® Yes  Know-how protection ● User program protection/password protection  Width 120 mm  Height Depth 130 mm  Weights	<ul> <li>Nesting levels</li> </ul>	8
Programming language         Yes           — FBD         Yes           — STL         Yes           — SCL         Yes           — GRAPH         Yes           — HiGraph®         Yes           Know-how protection         Yes           Vuser program protection/password protection         Yes           Dimensions         120 mm           Height         125 mm           Depth         130 mm           Weights	<ul> <li>System functions (SFC)</li> </ul>	see instruction list
— LAD       Yes         — FBD       Yes         — STL       Yes         — SCL       Yes         — GRAPH       Yes         — HiGraph®       Yes         Know-how protection       Yes         Vuser program protection/password protection       Yes         Dimensions       Yes         Width       120 mm         Height       125 mm         Depth       130 mm         Weights       Yes	<ul> <li>System function blocks (SFB)</li> </ul>	see instruction list
- FBD - STL - SCL - SCL - GRAPH - HiGraph® Yes  Know-how protection  ◆ User program protection/password protection  Yes  Dimensions  Width 120 mm Height 125 mm Depth 130 mm  Weights	Programming language	
- STL - SCL - GRAPH - HiGraph® Yes  Know-how protection  ● User program protection/password protection  Yes  Dimensions  Width 120 mm  Height 125 mm  Depth 130 mm  Weights	— LAD	Yes
- SCL Yes - GRAPH Yes - HiGraph® Yes  Know-how protection  ● User program protection/password protection Yes  Dimensions  Width 120 mm  Height 125 mm  Depth 130 mm  Weights	— FBD	Yes
— GRAPH — HiGraph® Yes  Know-how protection	— STL	Yes
— HiGraph® Yes  Know-how protection	— SCL	Yes
Know-how protection  ● User program protection/password protection  Yes  Dimensions  Width 120 mm  Height 125 mm  Depth 130 mm  Weights	— GRAPH	Yes
● User program protection/password protection  Dimensions  Width 120 mm  Height 125 mm  Depth 130 mm  Weights	— HiGraph®	Yes
Dimensions           Width         120 mm           Height         125 mm           Depth         130 mm           Weights         130 mm	Know-how protection	
Width         120 mm           Height         125 mm           Depth         130 mm           Weights         130 mm	<ul> <li>User program protection/password protection</li> </ul>	Yes
Height 125 mm Depth 130 mm Weights	Dimensions	
Depth 130 mm Weights	Width	120 mm
Weights	Height	125 mm
	Depth	130 mm
	Weights	
Weight, approx. 660 g	Weight access	660 a

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