



Figure similar

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

General information	
Engineering with	
<ul style="list-style-type: none"> <li>Programming package</li> </ul>	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 style="list-style-type: none"> <li>Rated value (DC)</li> <li>permissible range, lower limit (DC)</li> <li>permissible range, upper limit (DC)</li> </ul>	24 V 20.4 V 28.8 V
Digital inputs	
— Rated value (DC)	24 V
Digital outputs	
— Rated value (DC)	24 V
Input current	
Current consumption (rated value)	900 mA
Current consumption (in no-load operation), typ.	100 mA
Inrush current, typ.	11 A
$I^2t$	0.7 A <sup>2</sup> ·s
Digital inputs	
<ul style="list-style-type: none"> <li>from load voltage L+ (without load), max.</li> </ul>	70 mA
Digital outputs	
<ul style="list-style-type: none"> <li>from load voltage L+, max.</li> </ul>	100 mA
Power loss	
Power loss, typ.	10 W
Memory	
Work memory	
<ul style="list-style-type: none"> <li>integrated</li> <li>expandable</li> </ul>	64 kbyte No
Load memory	
<ul style="list-style-type: none"> <li>Plug-in (MMC)</li> <li>Plug-in (MMC), max.</li> <li>Data management on MMC (after last programming), min.</li> </ul>	Yes 8 Mbyte 10 y

<b>Backup</b>	
<ul style="list-style-type: none"> <li>• present</li> <li>• without battery</li> </ul>	<p>Yes; Guaranteed by MMC (maintenance-free)</p> <p>Yes; Program and data</p>
<b>CPU processing times</b>	
for bit operations, typ.	0.1 µs
for bit operations, max.	0.2 µs
for word operations, typ.	0.2 µs
for fixed point arithmetic, typ.	2 µs
for floating point arithmetic, typ.	3 µs
<b>CPU-blocks</b>	
Number of blocks (total)	1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.
<b>DB</b>	
<ul style="list-style-type: none"> <li>• Number, max.</li> <li>• Size, max.</li> </ul>	<p>511; Number range: 1 to 511</p> <p>16 kbyte</p>
<b>FB</b>	
<ul style="list-style-type: none"> <li>• Number, max.</li> <li>• Size, max.</li> </ul>	<p>1 024; Number range: 0 to 2047</p> <p>16 kbyte</p>
<b>FC</b>	
<ul style="list-style-type: none"> <li>• Number, max.</li> <li>• Size, max.</li> </ul>	<p>1 024; Number range: 0 to 2047</p> <p>16 kbyte</p>
<b>OB</b>	
<ul style="list-style-type: none"> <li>• Size, max.</li> <li>• Number of free cycle OBs</li> <li>• Number of time alarm OBs</li> <li>• Number of delay alarm OBs</li> <li>• Number of cyclic interrupt OBs</li> <li>• Number of process alarm OBs</li> <li>• Number of DPV1 alarm OBs</li> <li>• Number of startup OBs</li> <li>• Number of asynchronous error OBs</li> <li>• Number of synchronous error OBs</li> </ul>	<p>16 kbyte</p> <p>1; OB 1</p> <p>1; OB 10</p> <p>1; OB 20</p> <p>1; OB 35</p> <p>1; OB 40</p> <p>3; OB 55, 56, 57</p> <p>1; OB 100</p> <p>5; OB 80, 82, 85, 86, 87</p> <p>2; OB 121, 122</p>
<b>Nesting depth</b>	
<ul style="list-style-type: none"> <li>• per priority class</li> <li>• additional within an error OB</li> </ul>	<p>8</p> <p>4</p>
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
<ul style="list-style-type: none"> <li>• Number</li> </ul>	256
<b>Retentivity</b>	
— adjustable	Yes
— lower limit	0
— upper limit	255
<b>Counting range</b>	
— lower limit	0
— upper limit	999
<b>IEC counter</b>	
<ul style="list-style-type: none"> <li>• present</li> <li>• Type</li> <li>• Number</li> </ul>	<p>Yes</p> <p>SFB</p> <p>Unlimited (limited only by RAM capacity)</p>
<b>S7 times</b>	
<ul style="list-style-type: none"> <li>• Number</li> </ul>	256
<b>Retentivity</b>	
— adjustable	Yes
— lower limit	0
— upper limit	255
— preset	No retentivity
<b>Time range</b>	
— lower limit	10 ms

— upper limit	9 990 s
<b>IEC timer</b>	
• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)
<b>Data areas and their retentivity</b>	
retentive data area in total	all
<b>Flag</b>	
• Retentivity available	Yes; MB 0 to MB 255
• Retentivity preset	MB 0 to MB 15
• Number of clock memories	8; 1 memory byte
<b>Data blocks</b>	
• Retentivity adjustable	Yes; via non-retain property on DB
• Retentivity preset	Yes
<b>Local data</b>	
• per priority class, max.	510 byte
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	1 kbyte
• Outputs	1 kbyte
of which distributed	
— Inputs	1 006 byte; max.
— Outputs	1 006 byte; max.
<b>Process image</b>	
Default addresses of the integrated channels	
— Digital inputs	124.0 to 125.7
— Digital outputs	124.0 to 125.7
<b>Digital channels</b>	
• Inputs	8 064
— of which central	1 008
• Outputs	8 064
— of which central	1 008
<b>Analog channels</b>	
• Inputs	503
— of which central	248
• Outputs	503
— of which central	248
<b>Hardware configuration</b>	
Number of expansion units, max.	3
<b>Number of DP masters</b>	
• integrated	1
• via CP	4
<b>Number of operable FMs and CPs (recommended)</b>	
• FM	8
• CP, PtP	8
• CP, LAN	6
<b>Rack</b>	
• Racks, max.	4
• Modules per rack, max.	8; In rack 3 max. 7
<b>Time of day</b>	
<b>Clock</b>	
• Hardware clock (real-time)	Yes
• retentive and synchronizable	Yes
• Backup time	6 wk
• Deviation per day, max.	10 s
<b>Operating hours counter</b>	
• Number	1
• Range of values	0 to 2 <sup>31</sup> hours (when using SFC 101)

<ul style="list-style-type: none"> <li>Granularity</li> <li>retentive</li> </ul>	1 h Yes
<b>Clock synchronization</b>	
<ul style="list-style-type: none"> <li>supported</li> <li>to DP, master</li> <li>to DP, slave</li> </ul>	Yes Yes; With DP slave only slave clock Yes
<b>Digital inputs</b>	
Number of digital inputs	16
<ul style="list-style-type: none"> <li>of which inputs usable for technological functions</li> </ul>	12
integrated channels (DI)	16
Input characteristic curve in accordance with IEC 61131, type 1	Yes
<b>Number of simultaneously controllable inputs</b>	
<b>horizontal installation</b>	
— up to 40 °C, max.	16
— up to 60 °C, max.	8
<b>vertical installation</b>	
— up to 40 °C, max.	8
<b>Input voltage</b>	
<ul style="list-style-type: none"> <li>Rated value (DC)</li> <li>for signal "0"</li> <li>for signal "1"</li> </ul>	24 V -3 to +5V +15 to +30 V
<b>Input current</b>	
<ul style="list-style-type: none"> <li>for signal "1", typ.</li> </ul>	9 mA
<b>Input delay (for rated value of input voltage)</b>	
<b>for standard inputs</b>	
— parameterizable	Yes; 0.1 / 0.3 / 3 / 15 ms
— Rated value	3 ms
<b>for technological functions</b>	
— at "0" to "1", max.	16 µs
<b>Cable length</b>	
<ul style="list-style-type: none"> <li>shielded, max.</li> <li>unshielded, max.</li> </ul>	1 000 m; 100 m for technological functions 600 m; for technological functions: No
<b>for technological functions</b>	
— shielded, max.	100 m
— unshielded, max.	not allowed
<b>Digital outputs</b>	
Number of digital outputs	16
<ul style="list-style-type: none"> <li>of which high-speed outputs</li> </ul>	4
integrated channels (DO)	16
Short-circuit protection	Yes; Clocked electronically
<ul style="list-style-type: none"> <li>Response threshold, typ.</li> </ul>	1 A
Limitation of inductive shutdown voltage to	L+ (-48 V)
Controlling a digital input	Yes
<b>Switching capacity of the outputs</b>	
<ul style="list-style-type: none"> <li>on lamp load, max.</li> </ul>	5 W
<b>Load resistance range</b>	
<ul style="list-style-type: none"> <li>lower limit</li> <li>upper limit</li> </ul>	48 Ω 4 kΩ
<b>Output voltage</b>	
<ul style="list-style-type: none"> <li>for signal "1", min.</li> </ul>	L+ (-0.8 V)
<b>Output current</b>	
<ul style="list-style-type: none"> <li>for signal "1" rated value</li> <li>for signal "1" permissible range, min.</li> <li>for signal "1" permissible range, max.</li> <li>for signal "1" minimum load current</li> <li>for signal "0" residual current, max.</li> </ul>	500 mA 5 mA 0.6 A 5 mA 0.5 mA
<b>Parallel switching of two outputs</b>	

<ul style="list-style-type: none"> <li>• for uprating</li> </ul>	No
<ul style="list-style-type: none"> <li>• for redundant control of a load</li> </ul>	Yes
<b>Switching frequency</b>	
<ul style="list-style-type: none"> <li>• with resistive load, max.</li> </ul>	100 Hz
<ul style="list-style-type: none"> <li>• with inductive load, max.</li> </ul>	0.5 Hz
<ul style="list-style-type: none"> <li>• on lamp load, max.</li> </ul>	100 Hz
<ul style="list-style-type: none"> <li>• of the pulse outputs, with resistive load, max.</li> </ul>	2.5 kHz
<b>Total current of the outputs (per group)</b>	
horizontal installation	
— up to 40 °C, max.	3 A
— up to 60 °C, max.	2 A
vertical installation	
— up to 40 °C, max.	2 A
<b>Cable length</b>	
<ul style="list-style-type: none"> <li>• shielded, max.</li> </ul>	1 000 m
<ul style="list-style-type: none"> <li>• unshielded, max.</li> </ul>	600 m
<b>Analog inputs</b>	
integrated channels (AI)	0
<b>Analog outputs</b>	
integrated channels (AO)	0
<b>Encoder</b>	
Connectable encoders	
<ul style="list-style-type: none"> <li>• 2-wire sensor</li> </ul>	Yes
— permissible quiescent current (2-wire sensor), max.	1.5 mA
<b>Interfaces</b>	
Number of industrial Ethernet interfaces	0
Number of PROFINET interfaces	0
Number of RS 485 interfaces	2; MPI and PROFIBUS DP
Number of RS 422 interfaces	0
<b>MPI</b>	
<ul style="list-style-type: none"> <li>• Cable length, max.</li> </ul>	50 m; without repeater
<b>1. Interface</b>	
Interface type	Integrated RS 485 interface
Isolated	No
<b>Interface types</b>	
<ul style="list-style-type: none"> <li>• RS 485</li> </ul>	Yes
<b>Protocols</b>	
<ul style="list-style-type: none"> <li>• MPI</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• PROFIBUS DP master</li> </ul>	No
<ul style="list-style-type: none"> <li>• PROFIBUS DP slave</li> </ul>	No
<ul style="list-style-type: none"> <li>• Point-to-point connection</li> </ul>	No
<b>MPI</b>	
<ul style="list-style-type: none"> <li>• Number of connections</li> </ul>	8
<ul style="list-style-type: none"> <li>• Transmission rate, max.</li> </ul>	187.5 kbit/s
<b>Services</b>	
— PG/OP communication	Yes
— Routing	Yes
— Global data communication	Yes
— S7 basic communication	Yes
— S7 communication	Yes
— S7 communication, as client	No
— S7 communication, as server	Yes
<b>2. Interface</b>	
Interface type	Integrated RS 485 interface
Isolated	Yes
<b>Interface types</b>	
<ul style="list-style-type: none"> <li>• RS 485</li> </ul>	Yes

Protocols	
• MPI	No
• PROFINET IO Controller	No
• PROFINET CBA	No
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• Point-to-point connection	No
PROFIBUS DP master	
• Number of connections, max.	8; For PG/OP communication
• Transmission rate, max.	12 Mbit/s
• Number of DP slaves, max.	32
Services	
— PG/OP communication	Yes
— Routing	Yes
— Global data communication	No
— S7 basic communication	Yes; I blocks only
— S7 communication	Yes
— S7 communication, as client	No
— S7 communication, as server	Yes
— Equidistance	Yes
— Isochronous mode	No
— SYNC/FREEZE	Yes
— Activation/deactivation of DP slaves	Yes
— Direct data exchange (slave-to-slave communication)	Yes
— DPV1	Yes
Address area	
— Inputs, max.	1 kbyte
— Outputs, max.	1 kbyte
User data per DP slave	
— Inputs, max.	244 byte
— Outputs, max.	244 byte
PROFIBUS DP slave	
• Number of connections	8
• GSD file	The latest GSD file is available at: <a href="http://www.siemens.com/profibus-gsd">http://www.siemens.com/profibus-gsd</a>
• Transmission rate, max.	12 Mbit/s
• automatic baud rate search	Yes; only with passive interface
• Address area, max.	32
• User data per address area, max.	32 byte
Services	
— PG/OP communication	Yes
— Routing	Yes; Only with active interface
— Global data communication	No
— S7 basic communication	No
— S7 communication	Yes
— S7 communication, as client	No
— S7 communication, as server	Yes
— Direct data exchange (slave-to-slave communication)	Yes
— DPV1	No
Transfer memory	
— Inputs	244 byte
— Outputs	244 byte
Communication functions	
PG/OP communication	Yes
Global data communication	
• supported	Yes
• Number of GD loops, max.	4
• Number of GD packets, max.	4

<ul style="list-style-type: none"> <li>• Number of GD packets, transmitter, max.</li> </ul>	4
<ul style="list-style-type: none"> <li>• Number of GD packets, receiver, max.</li> </ul>	4
<ul style="list-style-type: none"> <li>• Size of GD packets, max.</li> </ul>	22 byte
<ul style="list-style-type: none"> <li>• Size of GD packet (of which consistent), max.</li> </ul>	22 byte
<b>S7 basic communication</b>	
<ul style="list-style-type: none"> <li>• supported</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• User data per job, max.</li> </ul>	76 byte
<ul style="list-style-type: none"> <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 as server)
<b>S7 communication</b>	
<ul style="list-style-type: none"> <li>• supported</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• as server</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• as client</li> </ul>	Yes; Via CP and loadable FB
<ul style="list-style-type: none"> <li>• User data per job, max.</li> </ul>	180 kbyte; With PUT/GET
<ul style="list-style-type: none"> <li>• User data per job (of which consistent), max.</li> </ul>	64 byte
<b>S5 compatible communication</b>	
<ul style="list-style-type: none"> <li>• supported</li> </ul>	Yes; via CP and loadable FC
<b>Number of connections</b>	
<ul style="list-style-type: none"> <li>• overall</li> </ul>	8
<ul style="list-style-type: none"> <li>• usable for PG communication <ul style="list-style-type: none"> <li>— reserved for PG communication</li> <li>— adjustable for PG communication, min.</li> <li>— adjustable for PG communication, max.</li> </ul> </li> </ul>	7 1 1 7
<ul style="list-style-type: none"> <li>• usable for OP communication <ul style="list-style-type: none"> <li>— reserved for OP communication</li> <li>— adjustable for OP communication, min.</li> <li>— adjustable for OP communication, max.</li> </ul> </li> </ul>	7 1 1 7
<ul style="list-style-type: none"> <li>• usable for S7 basic communication <ul style="list-style-type: none"> <li>— reserved for S7 basic communication</li> <li>— adjustable for S7 basic communication, min.</li> <li>— adjustable for S7 basic communication, max.</li> </ul> </li> </ul>	4 0 0 4
<ul style="list-style-type: none"> <li>• usable for routing</li> </ul>	4; max.
<b>S7 message functions</b>	
Number of login stations for message functions, max.	8
simultaneously active Alarm-S blocks, max.	20
<b>Test commissioning functions</b>	
Status block	Yes
Single step	Yes
Number of breakpoints	2
<b>Status/control</b>	
<ul style="list-style-type: none"> <li>• Status/control variable</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Variables</li> </ul>	Inputs, outputs, memory bits, DB, times, counters
<ul style="list-style-type: none"> <li>• Number of variables, max. <ul style="list-style-type: none"> <li>— of which status variables, max.</li> <li>— of which control variables, max.</li> </ul> </li> </ul>	30 30 14
<b>Forcing</b>	
<ul style="list-style-type: none"> <li>• Forcing</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Forcing, variables</li> </ul>	Inputs, outputs
<ul style="list-style-type: none"> <li>• Number of variables, max.</li> </ul>	10
<b>Diagnostic buffer</b>	
<ul style="list-style-type: none"> <li>• present</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Number of entries, max. <ul style="list-style-type: none"> <li>— adjustable</li> </ul> </li> </ul>	100 No
<b>Interrupts/diagnostics/status information</b>	
<b>Diagnostics indication LED</b>	
<ul style="list-style-type: none"> <li>• Status indicator digital input (green)</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Status indicator digital output (green)</li> </ul>	Yes
<b>Integrated Functions</b>	

Frequency measurement	Yes
controlled positioning	No
integrated function blocks (closed-loop control)	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 Functions" manual)
Limit frequency (pulse)	2.5 kHz
<b>Potential separation</b>	
Potential separation digital inputs	
• Potential separation digital inputs	Yes
• between the channels	No
• between the channels and backplane bus	Yes
Potential separation digital outputs	
• Potential separation digital outputs	Yes
• between the channels	Yes
• between the channels, in groups of	8
• between the channels and backplane bus	Yes
<b>Isolation</b>	
Isolation tested with	600 V DC
<b>Configuration</b>	
Configuration software	
• STEP 7	Yes; V5.3 SP2 with HW update
Programming	
• 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
<b>Dimensions</b>	
Width	120 mm
Height	125 mm
Depth	130 mm
<b>Weights</b>	
Weight, approx.	566 g
<b>last modified:</b>	3/4/2021 