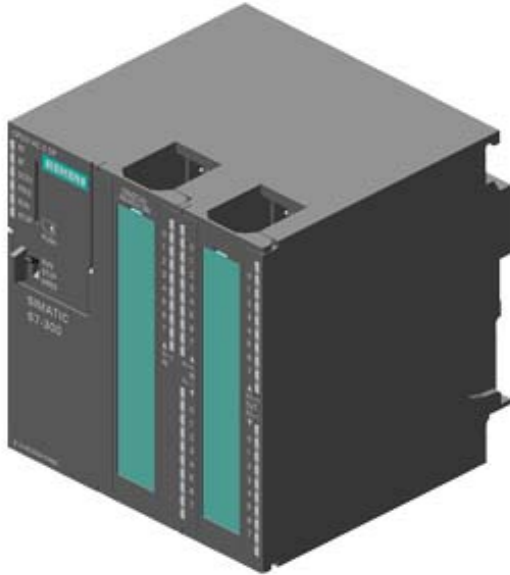


\*\*\*Spare part\*\*\* SIMATIC S7-300, CPU 314C-2 DP Compact CPU with MPI, 24 DI/16 DO, 4 AI, 2 AO, 1 Pt100, 4 high-speed counters (60 kHz), integrated DP interface, Integr. power supply 24 V DC, Work memory 96 KB, Front connector (2x 40-pole) and Micro Memory Card required



| 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+                                             |                                                                                         |
| • Rated value (DC)                                          | 24 V                                                                                    |
| • permissible range, lower limit (DC)                       | 20.4 V                                                                                  |
| • permissible range, upper limit (DC)                       | 28.8 V                                                                                  |
| Digital inputs                                              |                                                                                         |
| — Rated value (DC)                                          | 24 V                                                                                    |
| — Reverse polarity protection                               | Yes                                                                                     |

|                                                         |                                                                                               |
|---------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| <b>Digital outputs</b>                                  |                                                                                               |
| — Rated value (DC)                                      | 24 V                                                                                          |
| — Reverse polarity protection                           | No                                                                                            |
| <b>Analog outputs</b>                                   |                                                                                               |
| — Rated value (DC)                                      | 24 V                                                                                          |
| — Reverse polarity protection                           | Yes                                                                                           |
| <b>Input current</b>                                    |                                                                                               |
| Current consumption (rated value)                       | 1 000 mA                                                                                      |
| Current consumption (in no-load operation), typ.        | 150 mA                                                                                        |
| Inrush current, typ.                                    | 11 A                                                                                          |
| $I^2t$                                                  | 0.7 A <sup>2</sup> ·s                                                                         |
| <b>Digital inputs</b>                                   |                                                                                               |
| • from load voltage L+ (without load), max.             | 70 mA                                                                                         |
| <b>Digital outputs</b>                                  |                                                                                               |
| • from load voltage L+, max.                            | 100 mA                                                                                        |
| <b>Power loss</b>                                       |                                                                                               |
| Power loss, typ.                                        | 14 W                                                                                          |
| <b>Memory</b>                                           |                                                                                               |
| <b>Work memory</b>                                      |                                                                                               |
| • integrated                                            | 96 kbyte                                                                                      |
| • expandable                                            | No                                                                                            |
| <b>Load memory</b>                                      |                                                                                               |
| • Plug-in (MMC)                                         | Yes                                                                                           |
| • Plug-in (MMC), max.                                   | 8 Mbyte                                                                                       |
| • Data management on MMC (after last programming), min. | 10 y                                                                                          |
| <b>Backup</b>                                           |                                                                                               |
| • present                                               | Yes; Guaranteed by MMC (maintenance-free)                                                     |
| • without battery                                       | Yes; Program and data                                                                         |
| <b>CPU processing times</b>                             |                                                                                               |
| for bit operations, typ.                                | 0.1 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>                                               |                                                                                               |
| • Number, max.                                          | 511; Number range: 1 to 511                                                                   |
| • Size, max.                                            | 16 kbyte                                                                                      |
| <b>FB</b>                                               |                                                                                               |

|                                               |                                          |
|-----------------------------------------------|------------------------------------------|
| • Number, max.                                | 1 024; Number range: 0 to 2047           |
| • Size, max.                                  | 16 kbyte                                 |
| <b>FC</b>                                     |                                          |
| • Number, max.                                | 1 024; Number range: 0 to 2047           |
| • Size, max.                                  | 16 kbyte                                 |
| <b>OB</b>                                     |                                          |
| • 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 DPV1 alarm OBs                    | 3; OB 55, 56, 57                         |
| • Number of startup OBs                       | 1; OB 100                                |
| • Number of asynchronous error OBs            | 5; OB 80, 82, 85, 86, 87                 |
| • Number of synchronous error OBs             | 2; OB 121, 122                           |
| <b>Nesting depth</b>                          |                                          |
| • per priority class                          | 8                                        |
| • additional within an error OB               | 4                                        |
| <b>Counters, timers and their retentivity</b> |                                          |
| <b>S7 counter</b>                             |                                          |
| • Number                                      | 256                                      |
| <b>Retentivity</b>                            |                                          |
| — adjustable                                  | Yes                                      |
| — lower limit                                 | 0                                        |
| — upper limit                                 | 255                                      |
| — preset                                      | 8                                        |
| <b>Counting range</b>                         |                                          |
| — lower limit                                 | 0                                        |
| — upper limit                                 | 999                                      |
| <b>IEC counter</b>                            |                                          |
| • present                                     | Yes                                      |
| • Type                                        | SFB                                      |
| • Number                                      | Unlimited (limited only by RAM capacity) |
| <b>S7 times</b>                               |                                          |
| • Number                                      | 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, max. 64 KB                          |
| <b>Flag</b>                                         |                                          |
| • Number, max.                                      | 256 byte                                 |
| • 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                                  |
| <b>of which distributed</b>                         |                                          |
| — Inputs                                            | 979 byte                                 |
| — Outputs                                           | 986 byte                                 |
| <b>Process image</b>                                |                                          |
| • Inputs                                            | 128 byte                                 |
| • Outputs                                           | 128 byte                                 |
| <b>Default addresses of the integrated channels</b> |                                          |
| — Digital inputs                                    | 124.0 to 126.7                           |
| — Digital outputs                                   | 124.0 to 125.7                           |
| — Analog inputs                                     | 752 to 761                               |
| — Analog outputs                                    | 752 to 755                               |
| <b>Digital channels</b>                             |                                          |
| • Inputs                                            | 7 856                                    |
| — of which central                                  | 1 016                                    |
| • Outputs                                           | 7 904                                    |
| — of which central                                  | 1 008                                    |
| <b>Analog channels</b>                              |                                          |
| • Inputs                                            | 494                                      |

|                                                                 |                                                 |
|-----------------------------------------------------------------|-------------------------------------------------|
| — of which central                                              | 253                                             |
| • Outputs                                                       | 495                                             |
| — of which central                                              | 250                                             |
| <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                                                       | 10                                              |
| <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; At 40 °C ambient temperature              |
| • Deviation per day, max.                                       | 10 s                                            |
| <b>Operating hours counter</b>                                  |                                                 |
| • Number                                                        | 1                                               |
| • Number/Number range                                           | 0                                               |
| • Range of values                                               | 0 to 2 <sup>31</sup> hours (when using SFC 101) |
| • Granularity                                                   | 1 h                                             |
| • retentive                                                     | Yes; Must be restarted at each restart          |
| <b>Clock synchronization</b>                                    |                                                 |
| • supported                                                     | Yes                                             |
| • to MPI, master                                                | Yes                                             |
| • to MPI, slave                                                 | Yes                                             |
| • to DP, master                                                 | Yes; With DP slave only slave clock             |
| • to DP, slave                                                  | Yes                                             |
| • in AS, master                                                 | Yes                                             |
| <b>Digital inputs</b>                                           |                                                 |
| Number of digital inputs                                        | 24                                              |
| • of which inputs usable for technological functions            | 16                                              |
| integrated channels (DI)                                        | 24                                              |
| Input characteristic curve in accordance with IEC 61131, type 1 | Yes                                             |

|                                                       |                                           |
|-------------------------------------------------------|-------------------------------------------|
| <b>Number of simultaneously controllable inputs</b>   |                                           |
| horizontal installation                               |                                           |
| — up to 40 °C, max.                                   | 24                                        |
| — up to 60 °C, max.                                   | 12                                        |
| vertical installation                                 |                                           |
| — up to 40 °C, max.                                   | 12                                        |
| <b>Input voltage</b>                                  |                                           |
| • Rated value (DC)                                    | 24 V                                      |
| • for signal "0"                                      | -3 to +5V                                 |
| • for signal "1"                                      | +15 to +30 V                              |
| <b>Input current</b>                                  |                                           |
| • for signal "1", typ.                                | 9 mA                                      |
| <b>Input delay (for rated value of input voltage)</b> |                                           |
| for standard inputs                                   |                                           |
| — parameterizable                                     | Yes; 0.1 / 0.3 / 3 / 15 ms                |
| — Rated value                                         | 3 ms                                      |
| for technological functions                           |                                           |
| — at "0" to "1", max.                                 | 8 µs                                      |
| <b>Cable length</b>                                   |                                           |
| • shielded, max.                                      | 1 000 m; 50 m for technological functions |
| • unshielded, max.                                    | 600 m; for technological functions: No    |
| for technological functions                           |                                           |
| — shielded, max.                                      | 50 m                                      |
| — unshielded, max.                                    | not allowed                               |
| <b>Digital outputs</b>                                |                                           |
| Number of digital outputs                             | 16                                        |
| • of which high-speed outputs                         | 4                                         |
| integrated channels (DO)                              | 16                                        |
| Short-circuit protection                              | Yes; Clocked electronically               |
| • Response threshold, typ.                            | 1 A                                       |
| Limitation of inductive shutdown voltage to           | L+ (-48 V)                                |
| Controlling a digital input                           | Yes                                       |
| <b>Switching capacity of the outputs</b>              |                                           |
| • on lamp load, max.                                  | 5 W                                       |
| <b>Load resistance range</b>                          |                                           |
| • lower limit                                         | 48 Ω                                      |
| • upper limit                                         | 4 kΩ                                      |
| <b>Output voltage</b>                                 |                                           |
| • for signal "1", min.                                | L+ (-0.8 V)                               |
| <b>Output current</b>                                 |                                           |
| • for signal "1" rated value                          | 500 mA                                    |

|                                                                       |                                                    |
|-----------------------------------------------------------------------|----------------------------------------------------|
| • for signal "1" permissible range, min.                              | 5 mA                                               |
| • for signal "1" permissible range, max.                              | 0.6 A                                              |
| • for signal "1" minimum load current                                 | 5 mA                                               |
| • for signal "0" residual current, max.                               | 0.5 mA                                             |
| <b>Parallel switching of two outputs</b>                              |                                                    |
| • for uprating                                                        | No                                                 |
| • for redundant control of a load                                     | Yes                                                |
| <b>Switching frequency</b>                                            |                                                    |
| • with resistive load, max.                                           | 100 Hz                                             |
| • with inductive load, max.                                           | 0.5 Hz                                             |
| • on lamp load, max.                                                  | 100 Hz                                             |
| • of the pulse outputs, with resistive load, max.                     | 2.5 kHz                                            |
| <b>Total current of the outputs (per group)</b>                       |                                                    |
| <b>horizontal installation</b>                                        |                                                    |
| — up to 40 °C, max.                                                   | 3 A                                                |
| — up to 60 °C, max.                                                   | 2 A                                                |
| <b>vertical installation</b>                                          |                                                    |
| — up to 40 °C, max.                                                   | 2 A                                                |
| <b>Cable length</b>                                                   |                                                    |
| • shielded, max.                                                      | 1 000 m                                            |
| • unshielded, max.                                                    | 600 m                                              |
| <b>Analog inputs</b>                                                  |                                                    |
| <b>Number of analog inputs</b>                                        |                                                    |
| • 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                                   |
| 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 |
| <b>Input ranges</b>                                                   |                                                    |
| • Current                                                             | Yes                                                |
| • Resistance thermometer                                              | Yes; Pt 100 / 10 MΩ                                |

|                                                            |                                                   |
|------------------------------------------------------------|---------------------------------------------------|
| • Resistance                                               | Yes                                               |
| <b>Input ranges (rated values), voltages</b>               |                                                   |
| • 0 to +10 V                                               | Yes                                               |
| — Input resistance (0 to 10 V)                             | 100 k $\Omega$                                    |
| <b>Input ranges (rated values), currents</b>               |                                                   |
| • 0 to 20 mA                                               | Yes                                               |
| — Input resistance (0 to 20 mA)                            | 100 $\Omega$                                      |
| • -20 mA to +20 mA                                         | Yes                                               |
| — Input resistance (-20 mA to +20 mA)                      | 100 $\Omega$                                      |
| • 4 mA to 20 mA                                            | Yes                                               |
| — Input resistance (4 mA to 20 mA)                         | 100 $\Omega$                                      |
| <b>Input ranges (rated values), resistance thermometer</b> |                                                   |
| • Pt 100                                                   | Yes                                               |
| — Input resistance (Pt 100)                                | 10 M $\Omega$                                     |
| <b>Input ranges (rated values), resistors</b>              |                                                   |
| • 0 to 600 ohms                                            | Yes                                               |
| — Input resistance (0 to 600 ohms)                         | 10 M $\Omega$                                     |
| <b>Thermocouple (TC)</b>                                   |                                                   |
| Temperature compensation                                   |                                                   |
| — parameterizable                                          | No                                                |
| <b>Characteristic linearization</b>                        |                                                   |
| • parameterizable                                          | Yes; by software                                  |
| — for resistance thermometer                               | Pt 100                                            |
| <b>Cable length</b>                                        |                                                   |
| • shielded, max.                                           | 100 m                                             |
| <b>Analog outputs</b>                                      |                                                   |
| Number of analog outputs                                   | 2                                                 |
| integrated channels (AO)                                   | 2                                                 |
| Voltage output, short-circuit protection                   | Yes                                               |
| Voltage output, short-circuit current, max.                | 55 mA                                             |
| Current output, no-load voltage, max.                      | 17 V                                              |
| <b>Output ranges, voltage</b>                              |                                                   |
| • 0 to 10 V                                                | Yes                                               |
| • -10 V to +10 V                                           | Yes                                               |
| <b>Output ranges, current</b>                              |                                                   |
| • 0 to 20 mA                                               | Yes                                               |
| • -20 mA to +20 mA                                         | Yes                                               |
| • 4 mA to 20 mA                                            | Yes                                               |
| <b>Connection of actuators</b>                             |                                                   |
| • for voltage output two-wire connection                   | Yes; Without compensation of the line resistances |
| • for voltage output four-wire connection                  | No                                                |



|                                                                            |                  |
|----------------------------------------------------------------------------|------------------|
| • for current output two-wire connection                                   | Yes              |
| <b>Load impedance (in rated range of output)</b>                           |                  |
| • with voltage outputs, min.                                               | 1 k $\Omega$     |
| • with voltage outputs, capacitive load, max.                              | 0.1 $\mu$ F      |
| • with current outputs, max.                                               | 300 $\Omega$     |
| • with current outputs, inductive load, max.                               | 0.1 mH           |
| <b>Destruction limits against externally applied voltages and currents</b> |                  |
| • Voltages at the outputs towards MANA                                     | 16 V; Permanent  |
| • Current, max.                                                            | 50 mA; Permanent |
| <b>Cable length</b>                                                        |                  |
| • shielded, max.                                                           | 200 m            |

|                                                                        |                                                    |
|------------------------------------------------------------------------|----------------------------------------------------|
| <b>Analog value generation for the inputs</b>                          |                                                    |
| Measurement principle                                                  | Actual value encryption (successive approximation) |
| <b>Integration and conversion time/resolution per channel</b>          |                                                    |
| • Resolution with overrange (bit including sign), max.                 | 12 bit                                             |
| • Integration time, parameterizable                                    | Yes; 2,5 / 16,6 / 20 ms                            |
| • Interference voltage suppression for interference frequency f1 in Hz | 400 / 60 / 50 Hz                                   |
| • permissible input frequency, max.                                    | 400 Hz                                             |
| • Time constant of the input filter                                    | 0.38 ms                                            |
| • Basic execution time of the module (all channels released)           | 1 ms                                               |

|                                                               |        |
|---------------------------------------------------------------|--------|
| <b>Analog value generation for the outputs</b>                |        |
| <b>Integration and conversion time/resolution per channel</b> |        |
| • Resolution with overrange (bit including sign), max.        | 12 bit |
| • Conversion time (per channel)                               | 1 ms   |
| <b>Settling time</b>                                          |        |
| • for resistive load                                          | 0.6 ms |
| • for capacitive load                                         | 1 ms   |
| • for inductive load                                          | 0.5 ms |

|                                                         |                                                   |
|---------------------------------------------------------|---------------------------------------------------|
| <b>Encoder</b>                                          |                                                   |
| <b>Connection of signal encoders</b>                    |                                                   |
| • 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                                                |

|                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• for resistance measurement with four-wire connection</li> </ul>                                                                                                                                                                                                                                                                       | No                                                                                                                                      |
| <b>Connectable encoders</b>                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                         |
| <ul style="list-style-type: none"> <li>• 2-wire sensor <ul style="list-style-type: none"> <li>— permissible quiescent current (2-wire sensor), max.</li> </ul> </li> </ul>                                                                                                                                                                                                     | Yes<br>1.5 mA                                                                                                                           |
| <b>Errors/accuracies</b>                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                         |
| 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 range), (+/-)                                                                                                                                                                                                                                                                                                      | 0.06 %                                                                                                                                  |
| Output ripple (relative to output range, bandwidth 0 to 50 kHz), (+/-)                                                                                                                                                                                                                                                                                                         | 0.1 %                                                                                                                                   |
| Linearity error (relative to output range), (+/-)                                                                                                                                                                                                                                                                                                                              | 0.15 %                                                                                                                                  |
| Temperature error (relative to output range), (+/-)                                                                                                                                                                                                                                                                                                                            | 0.01 %/K                                                                                                                                |
| Crosstalk between the outputs, min.                                                                                                                                                                                                                                                                                                                                            | 60 dB                                                                                                                                   |
| Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)                                                                                                                                                                                                                                                                                                     | 0.06 %                                                                                                                                  |
| <b>Operational error limit in overall temperature range</b>                                                                                                                                                                                                                                                                                                                    |                                                                                                                                         |
| <ul style="list-style-type: none"> <li>• Voltage, relative to input range, (+/-)</li> <li>• Current, relative to input range, (+/-)</li> <li>• Resistance, relative to input range, (+/-)</li> <li>• Voltage, relative to output range, (+/-)</li> <li>• Current, relative to output range, (+/-)</li> </ul>                                                                   | 1 %<br>1 %<br>5 %<br>1 %<br>1 %                                                                                                         |
| <b>Basic error limit (operational limit at 25 °C)</b>                                                                                                                                                                                                                                                                                                                          |                                                                                                                                         |
| <ul style="list-style-type: none"> <li>• Voltage, relative to input range, (+/-)</li> <li>• Current, relative to input range, (+/-)</li> <li>• Resistance, relative to input range, (+/-)</li> <li>• Resistance thermometer, relative to input range, (+/-)</li> <li>• Voltage, relative to output range, (+/-)</li> <li>• Current, relative to output range, (+/-)</li> </ul> | 0.7 %; Linearity error $\pm 0.06$ %<br>0.7 %; Linearity error $\pm 0.06$ %<br>3 %; Linearity error $\pm 0.2$ %<br>3 %<br>0.7 %<br>0.7 % |
| <b>Interference voltage suppression for <math>f = n \times (f_1 \pm 1 \%)</math>, <math>f_1</math> = interference frequency</b>                                                                                                                                                                                                                                                |                                                                                                                                         |
| <ul style="list-style-type: none"> <li>• Series mode interference (peak value of interference &lt; rated value of input range), min.</li> <li>• Common mode interference, min.</li> </ul>                                                                                                                                                                                      | 30 dB<br>40 dB                                                                                                                          |
| <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                                                                                                                  |

| 1. Interface                                                                                                                                                                                                                                                                |                                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| Interface type                                                                                                                                                                                                                                                              | Integrated RS 485 interface                    |
| Isolated                                                                                                                                                                                                                                                                    | No                                             |
| Power supply to interface (15 to 30 V DC), max.                                                                                                                                                                                                                             | 200 mA                                         |
| Interface types                                                                                                                                                                                                                                                             |                                                |
| <ul style="list-style-type: none"> <li>• RS 485</li> </ul>                                                                                                                                                                                                                  | Yes                                            |
| Protocols                                                                                                                                                                                                                                                                   |                                                |
| <ul style="list-style-type: none"> <li>• MPI</li> <li>• PROFIBUS DP master</li> <li>• PROFIBUS DP slave</li> <li>• Point-to-point connection</li> </ul>                                                                                                                     | Yes<br>No<br>No<br>No                          |
| MPI                                                                                                                                                                                                                                                                         |                                                |
| <ul style="list-style-type: none"> <li>• Number of connections</li> <li>• Transmission rate, max.</li> </ul>                                                                                                                                                                | 12<br>187.5 kbit/s                             |
| Services                                                                                                                                                                                                                                                                    |                                                |
| <ul style="list-style-type: none"> <li>— PG/OP communication</li> <li>— Routing</li> <li>— Global data communication</li> <li>— S7 basic communication</li> <li>— S7 communication</li> <li>— S7 communication, as client</li> <li>— S7 communication, as server</li> </ul> | Yes<br>Yes<br>Yes<br>Yes<br>Yes<br>No<br>Yes   |
| 2. Interface                                                                                                                                                                                                                                                                |                                                |
| Interface type                                                                                                                                                                                                                                                              | Integrated RS 485 interface                    |
| Isolated                                                                                                                                                                                                                                                                    | Yes                                            |
| Power supply to interface (15 to 30 V DC), max.                                                                                                                                                                                                                             | 200 mA                                         |
| Number of connection resources                                                                                                                                                                                                                                              | 12                                             |
| Interface types                                                                                                                                                                                                                                                             |                                                |
| <ul style="list-style-type: none"> <li>• RS 485</li> </ul>                                                                                                                                                                                                                  | Yes                                            |
| Protocols                                                                                                                                                                                                                                                                   |                                                |
| <ul style="list-style-type: none"> <li>• MPI</li> <li>• PROFINET IO Controller</li> <li>• PROFINET CBA</li> <li>• PROFIBUS DP master</li> <li>• PROFIBUS DP slave</li> <li>• Point-to-point connection</li> </ul>                                                           | No<br>No<br>No<br>Yes<br>Yes<br>No             |
| PROFIBUS DP master                                                                                                                                                                                                                                                          |                                                |
| <ul style="list-style-type: none"> <li>• Number of connections, max.</li> <li>• Transmission rate, max.</li> <li>• Number of DP slaves, max.</li> </ul>                                                                                                                     | 12; For PG/OP communication<br>12 Mbit/s<br>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                                                                                                                           |
| <b>Address area</b>                                   |                                                                                                                               |
| — Inputs, max.                                        | 1 kbyte                                                                                                                       |
| — Outputs, max.                                       | 1 kbyte                                                                                                                       |
| <b>User data per DP slave</b>                         |                                                                                                                               |
| — Inputs, max.                                        | 244 byte                                                                                                                      |
| — Outputs, max.                                       | 244 byte                                                                                                                      |
| <b>PROFIBUS DP slave</b>                              |                                                                                                                               |
| • Number of connections                               | 12                                                                                                                            |
| • GSD file                                            | The latest GSD file is available at:<br><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                                                                                                                       |
| <b>Services</b>                                       |                                                                                                                               |
| — 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                                                                                                                            |
| <b>Transfer memory</b>                                |                                                                                                                               |
| — Inputs                                              | 244 byte                                                                                                                      |
| — Outputs                                             | 244 byte                                                                                                                      |

| Communication functions                                                                                                                           |                                                                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| PG/OP communication                                                                                                                               | Yes                                                                                |
| Global data communication                                                                                                                         |                                                                                    |
| <ul style="list-style-type: none"> <li>supported</li> </ul>                                                                                       | Yes                                                                                |
| <ul style="list-style-type: none"> <li>Number of GD loops, max.</li> </ul>                                                                        | 4                                                                                  |
| <ul style="list-style-type: none"> <li>Number of GD packets, max.</li> </ul>                                                                      | 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                                                                            |
| S7 basic communication                                                                                                                            |                                                                                    |
| <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) |
| S7 communication                                                                                                                                  |                                                                                    |
| <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                                                                            |
| S5 compatible communication                                                                                                                       |                                                                                    |
| <ul style="list-style-type: none"> <li>supported</li> </ul>                                                                                       | Yes; via CP and loadable FC                                                        |
| Number of connections                                                                                                                             |                                                                                    |
| <ul style="list-style-type: none"> <li>overall</li> </ul>                                                                                         | 12                                                                                 |
| <ul style="list-style-type: none"> <li>usable for PG communication</li> </ul>                                                                     | 11                                                                                 |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>reserved for PG communication</li> </ul> </li> </ul>               | 1                                                                                  |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>adjustable for PG communication, min.</li> </ul> </li> </ul>       | 1                                                                                  |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>adjustable for PG communication, max.</li> </ul> </li> </ul>       | 11                                                                                 |
| <ul style="list-style-type: none"> <li>usable for OP communication</li> </ul>                                                                     | 11                                                                                 |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>reserved for OP communication</li> </ul> </li> </ul>               | 1                                                                                  |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>adjustable for OP communication, min.</li> </ul> </li> </ul>       | 1                                                                                  |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>adjustable for OP communication, max.</li> </ul> </li> </ul>       | 11                                                                                 |
| <ul style="list-style-type: none"> <li>usable for S7 basic communication</li> </ul>                                                               | 8                                                                                  |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>reserved for S7 basic communication</li> </ul> </li> </ul>         | 0                                                                                  |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>adjustable for S7 basic communication, min.</li> </ul> </li> </ul> | 0                                                                                  |
| <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>adjustable for S7 basic communication, max.</li> </ul> </li> </ul> | 8                                                                                  |
| <ul style="list-style-type: none"> <li>usable for routing</li> </ul>                                                                              | 4; max.                                                                            |
| S7 message functions                                                                                                                              |                                                                                    |

|                                                      |                                                                                  |
|------------------------------------------------------|----------------------------------------------------------------------------------|
| Number of login stations for message functions, max. | 12; Depending on the configured connections for PG/OP and S7 basic communication |
| Process diagnostic messages                          | Yes                                                                              |
| simultaneously active Alarm-S blocks, max.           | 40                                                                               |

### Test commissioning functions

|                       |     |
|-----------------------|-----|
| Status block          | Yes |
| Single step           | Yes |
| Number of breakpoints | 2   |

### Status/control

|                                    |                                                   |
|------------------------------------|---------------------------------------------------|
| • 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

|                             |                 |
|-----------------------------|-----------------|
| • Forcing                   | Yes             |
| • Forcing, variables        | Inputs, outputs |
| • Number of variables, max. | 10              |

### Diagnostic buffer

|                           |     |
|---------------------------|-----|
| • present                 | Yes |
| • Number of entries, max. | 100 |

### Interrupts/diagnostics/status information

|                                           |     |
|-------------------------------------------|-----|
| Diagnostics indication LED                |     |
| • Status indicator digital input (green)  | Yes |
| • Status indicator digital output (green) | Yes |

### Integrated Functions

|                                                  |                                                                                |
|--------------------------------------------------|--------------------------------------------------------------------------------|
| Number of counters                               | 4; See "Technological Functions" manual                                        |
| Counting frequency (counter) max.                | 60 kHz                                                                         |
| Frequency measurement                            | Yes                                                                            |
| Number of frequency meters                       | 4; up to 60 kHz (see "Technological Functions" manual)                         |
| controlled positioning                           | Yes                                                                            |
| integrated function blocks (closed-loop control) | PID controller (see "Technological Functions" manual)                          |
| PID controller                                   | Yes                                                                            |
| Number of pulse outputs                          | 4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual) |
| Limit frequency (pulse)                          | 2.5 kHz                                                                        |

### Potential separation

|                                          |     |
|------------------------------------------|-----|
| 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                          |
| Potential separation analog inputs            |                              |
| • Potential separation analog inputs          | Yes; common for analog I/O   |
| • between the channels                        | No                           |
| • between the channels and backplane bus      | Yes                          |
| Potential separation analog outputs           |                              |
| • Potential separation analog outputs         | Yes; common for analog I/O   |
| • between the channels                        | No                           |
| • between the channels and backplane bus      | Yes                          |
| Isolation                                     |                              |
| Isolation tested with                         | 600 V DC                     |
| Configuration                                 |                              |
| 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                          |
| — CFC                                         | 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                                       |                              |
| Weight, approx.                               | 676 g                        |

last modified:

12/10/2020