

\*\*\*Spare part\*\*\* SIMATIC S7-200, CPU 224XP Compact unit, AC power supply 14DI DC/10DO relay, 2 AI, 1 AO, 12/16 KB progr./10 KB data, 2 PPI/user-programmable interface



Figure similar

### Supply voltage

Rated value (AC)

- |            |     |
|------------|-----|
| • 120 V AC | Yes |
| • 230 V AC | Yes |

Load voltage L+

- |                                       |      |
|---------------------------------------|------|
| • Rated value (DC)                    | 24 V |
| • permissible range, lower limit (DC) | 5 V  |
| • permissible range, upper limit (DC) | 30 V |

Load voltage L1

- |  |                             |
|--|-----------------------------|
| • Rated value (AC)                         | 100 V; 100 V AC to 230 V AC |
| • permissible range, lower limit (AC)      | 5 V                         |
| • permissible range, upper limit (AC)      | 250 V                       |
| • permissible frequency range, lower limit | 47 Hz                       |
| • permissible frequency range, upper limit | 63 Hz                       |

### Input current

|                      |                |
|----------------------|----------------|
| Inrush current, max. | 20 A; at 264 V |
|----------------------|----------------|

|                              |  |
|------------------------------|--|
| from supply voltage L1, max. | 220 mA; 35 to 100 mA (240 V); 70 to 220 mA (120 V); output current for expansion modules (5 V DC) 600 mA |
|------------------------------|--|

### Encoder supply

|                            |  |
|----------------------------|--|
| 24 V encoder supply        |  |
| • 24 V                     | Yes; Permissible range: 20.4V to 28.8V |
| • Short-circuit protection | Yes; electronic at 280 mA              |
| • Output current, max.     | 280 mA                                 |

### Power loss

|                  |      |
|------------------|------|
| Power loss, typ. | 11 W |
|------------------|------|

### Memory

|                                     |   |
|-------------------------------------|---|
| Number of memory modules (optional) | 1; pluggable memory module, content identical with integral EEPROM; can additionally store recipes, data logs and other files |
|-------------------------------------|---|

|                            |   |
|----------------------------|---|
| Work memory                |   |
| • integrated (for program) | 16 kbyte; 12 KB with active run-time edit |
| • integrated (for data)    | 10 kbyte                                  |

|           |   |
|-----------|---|
| Backup    |   |
| • present | Yes; Program: Entire program maintenance-free on integral EEPROM, programmable via CPU; data: Entire DB 1 loaded from PG/PC maintenance-free on integral EEPROM, current values of DB 1 in RAM, retentive memory bits, timers, counters, etc. maintenance-free via high-performance capacitor; optional battery for long-term buffering |

### Battery

|                     |   |
|---------------------|---|
| Backup battery      |   |
| • Backup time, max. | 100 h; (min. 70 h at 40 °C); 200 days (typ.) with optional battery module |

### CPU processing times

|                          |         |
|--------------------------|---------|
| for bit operations, max. | 0.22 µs |
|--------------------------|---------|

### Counters, timers and their retentivity

|                |  |
|----------------|--|
| S7 counter     |  |
| • Number       | 256  |
| Retentivity    |  |
| — adjustable   | Yes; via high-performance capacitor or battery |
| — lower limit  | 1  |
| — upper limit  | 256  |
| Counting range |  |
| — lower limit  | 0  |
| — upper limit  | 32 767   |
| S7 times       |  |
| • Number       | 256  |
| Retentivity    |  |

|                   |   |
|-------------------|---|
| — adjustable      | Yes; via high-performance capacitor or battery  |
| — upper limit     | 64  |
| <b>Time range</b> |   |
| — lower limit     | 1 ms  |
| — upper limit     | 54 min; 4 timers: 1 ms to 30 s; 16 timers: 10 ms to 5 min; 236 timers: 100 ms to 54 min |

|   |   |
|---|---|
| <b>Data areas and their retentivity</b> |   |
| <b>Flag</b>                             |   |
| • Number, max.                          | 32 byte   |
| • of which retentive with battery       | 0 to 255, via high-performance capacitor or battery, adjustable |
| • of which retentive without battery    | 0 to 112 in EEPROM, adjustable                                  |

|                                     |   |
|-------------------------------------|---|
| <b>Hardware configuration</b>       |   |
| Number of expansion units, max.     | 7; Only expansion modules of the S7-22x series can be used. Due to the limited output current, the use of expansion modules may be limited. |
| connectable programming devices/PCs | SIMATIC PG/PC, standard PC  |
| <b>Expansion modules</b>            |   |
| • Analog inputs/outputs, max.       | 38; 2 onboard inputs and 1 output, also max. 28 inputs and 7 outputs (EM) or max. 0 inputs and 14 outputs (EM)                              |
| • Digital inputs/outputs, max.      | 168; max. 94 inputs and 74 outputs (CPU + EM)   |
| • AS-Interface inputs/outputs, max. | 62; AS-Interface A/B slaves (CP 243-2)  |

|   |   |
|---|---|
| <b>Digital inputs</b>                                 |   |
| Number of digital inputs                              | 14  |
| Source/sink input                                     | Yes; optionally, per group                              |
| <b>Input voltage</b>                                  |   |
| • Rated value (DC)                                    | 24 V  |
| • for signal "0"                                      | 0V to 5V; 0V to 1V (I 0.3 to I 0.5)                     |
| • for signal "1"                                      | min. 15 V; min. 4 V (I 0.3 to I 0.5)                    |
| <b>Input current</b>                                  |   |
| • for signal "1", typ.                                | 2.5 mA; 8 mA for I 0.3 to I 0.5                         |
| <b>Input delay (for rated value of input voltage)</b> |   |
| for standard inputs                                   |   |
| — parameterizable                                     | Yes; all  |
| — at "0" to "1", min.                                 | 0.2 ms  |
| — at "0" to "1", max.                                 | 12.8 ms   |
| for interrupt inputs                                  |   |
| — parameterizable                                     | Yes; I 0.0 to I 0.3                                     |
| for technological functions                           |   |
| — parameterizable                                     | Yes; (E 0.0 to E 1.5) up to 200 kHz                     |
| <b>Cable length</b>                                   |   |
| • shielded, max.                                      | 500 m; Standard input: 500 m, high-speed counters: 50 m |

- unshielded, max.

300 m; not for high-speed signals

## Digital outputs

|   |  |
|---|--|
| Number of digital outputs                         | 10; Relays   |
| Short-circuit protection                          | No; to be provided externally                                      |
| <b>Switching capacity of the outputs</b>          |  |
| • with resistive load, max.                       | 2 A  |
| • on lamp load, max.                              | 200 W; 30 W with DC, 200 W with AC                                 |
| <b>Output voltage</b>                             |  |
| • for signal "1", min.                            | L+/L1  |
| <b>Output current</b>                             |  |
| • for signal "1" rated value                      | 2 A  |
| • for signal "0" residual current, max.           | 0 mA   |
| <b>Output delay with resistive load</b>           |  |
| • "0" to "1", max.                                | 10 ms; all outputs   |
| • "1" to "0", max.                                | 10 ms; all outputs   |
| <b>Parallel switching of two outputs</b>          |  |
| • for uprating                                    | No   |
| <b>Switching frequency</b>                        |  |
| • of the pulse outputs, with resistive load, max. | 1 Hz   |
| <b>Total current of the outputs (per group)</b>   |  |
| all mounting positions                            |  |
| — up to 40 °C, max.                               | 10 A   |
| horizontal installation                           |  |
| — up to 55 °C, max.                               | 10 A   |
| <b>Relay outputs</b>                              |  |
| • Number of relay outputs                         | 10   |
| • Number of operating cycles, max.                | 10 000 000; mechanically 10 million, at rated load voltage 100 000 |
| <b>Cable length</b>                               |  |
| • shielded, max.                                  | 500 m  |
| • unshielded, max.                                | 150 m  |

## Analog inputs

|                                 |   |
|---------------------------------|---|
| Number of analog potentiometers | 2; Analog potentiometer; resolution 8 bit |
|---------------------------------|---|

## Encoder

|   |      |
|---|------|
| <b>Connectable encoders</b>                           |      |
| • 2-wire sensor                                       | Yes  |
| — permissible quiescent current (2-wire sensor), max. | 1 mA |

## 1. Interface

|                  |                             |
|------------------|-----------------------------|
| Interface type   | Integrated RS 485 interface |
| Physics          | RS 485                      |
| <b>Protocols</b> |                             |

- MPI Yes; As MPI slave for data exchange with MPI masters (S7-300/S7-400 CPUs, OPs, TDs, Push Button Panels); S7-200-internal CPU/CPU communication is possible in the MPI network with restrictions; transmission rates: 19.2/187.5 kbit/s
- PPI Yes; with PPI protocol for program functions, HMI functions (TD 200, OP), S7-200-internal CPU/CPU communication ; transmission rates 9.6/19.2/187.5 kbit/s
- serial data exchange Yes; As freely programmable interface with interrupt facility for serial data exchange with third-party devices with ASCII protocol transfer rates: 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 38.4 / 57.6 / 115.2 kbps; the PC/PPI cable can also be used as RS 232/RS 485 converter

| MPI                       |              |
|---------------------------|--------------|
| • Transmission rate, min. | 19.2 kbit/s  |
| • Transmission rate, max. | 187.5 kbit/s |

## 2. Interface

|                |                             |
|----------------|-----------------------------|
| Interface type | Integrated RS 485 interface |
|----------------|-----------------------------|

|         |        |
|---------|--------|
| Physics | RS 485 |
|---------|--------|

### Protocols

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## Integrated Functions

|                                   |  |
|-----------------------------------|--|
| Number of counters                | 6; High-speed counters (2 to 200 kHz and 4 to 30 kHz), 32 bit (incl. sign), can be used as up/down counters or for connecting incremental encoders with 2 pulse trains offset by 90° (max. 1 to 100 kHz and 3 to 20 kHz (A/B counters)); parameterizable enable and reset input; interrupt facilities (incl. call of subroutine with any content) when the setpoint is reached; reversal in counting direction, etc. |
| Counting frequency (counter) max. | 200 kHz  |
| Number of alarm inputs            | 4; 4 rising edges and/or 4 falling edges   |

## Potential separation

| Potential separation digital inputs  |             |
|--------------------------------------|-------------|
| • between the channels               | Yes         |
| • between the channels, in groups of | 6 and 8     |
| Potential separation digital outputs |             |
| • between the channels               | Yes; Relays |

- between the channels, in groups of

3 and 4

## Permissible potential difference

between different circuits

500 V DC between 24 V DC and 5 V DC; 1500 V AC between 24 V DC and 230 V AC

## Degree and class of protection

Degree of protection acc. to EN 60529

- IP20

Yes

## Ambient conditions

Ambient temperature during operation

- horizontal installation, min. 0 °C
- horizontal installation, max. 55 °C
- vertical installation, min. 0 °C
- vertical installation, max. 45 °C

Air pressure acc. to IEC 60068-2-13

- permissible range, lower limit 860 hPa
- permissible range, upper limit 1 080 hPa

Relative humidity

- Operation, min. 5 %
- Operation, max. 95 %; RH class 2 in accordance with IEC 1131-2

## Configuration

Programming

- Command set Bit logic instructions, compare instructions, timer instructions, counter instructions, clock instructions, transmissions instructions, table instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions, integer maths, floating-point math instructions, numerical functions
- Program processing free cycle (OB 1), interrupt-controller, time-controlled (1 to 255 ms)
- Program organization 1 OB, 1 DB, 1 SDB subroutines with/without parameter transfer
- Number of subroutines, max. 64

Programming language

- LAD Yes
- FBD Yes
- STL Yes

Know-how protection

- User program protection/password protection Yes; 3-stage password protection

## Connection method

Plug-in I/O terminals

Yes

## Dimensions

Width

140 mm

|                       |            |
|-----------------------|------------|
| Height                | 80 mm      |
| Depth                 | 62 mm      |
| <b>Weights</b>        |            |
| Weight, approx.       | 440 g      |
| <b>last modified:</b> | 01/29/2020 |