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## Data sheet 6ES7317-7TK10-0AB0




SIMATIC S7-300, CPU 317T-3 PN/DP, Central processing unit for PLC and technology tasks, 1024 KB work memory, 1st interface MPI/DP 12 Mbit/s, 2nd interface DP (drive), 3rd interface Ethernet PROFINET with 2-port switch, Integr. I/O for technology, Front connector (1x 40-pole) and Micro Memory Card min. 8 MB required

| | |
|---|---|
| **General information** | |
| HW functional status | 01 |
| Firmware version | CPU: V3.2; integrated technology V4.1.5 |
| Engineering with | |
| • Programming package | STEP 7 V5.5 SP2 or higher and S7-Technology option package V4.2 SP3 |
| **Supply voltage** | |
| Rated value (DC) | |
| • 24 V DC | Yes |
| permissible range, lower limit (DC) | 19.2 V |
| permissible range, upper limit (DC) | 28.8 V |
| external protection for power supply lines (recommendation) | 2 A min. |
| Load voltage L+ | |
| • Rated value (DC) | 24 V |
| • Reverse polarity protection | Yes |
| Digital outputs | |
| — Rated value (DC) | 24 V; 2L+ |
| — Reverse polarity protection | No; 2L+ |


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| Input current | |
|---|---|
| Current consumption (rated value) | 1 050 mA |
| Current consumption (in no-load operation), typ. | 230 mA |
| Inrush current, typ. | 6.5 A |
| $I^2t$ | 1 $A^2 \cdot s$ |

| Power loss | |
|---|---|
| Power loss, typ. | 7.5 W |

| Memory | |
|---|---|
| Work memory | |
| • integrated | 1 024 kbyte |
| • expandable | No |
| • Size of retentive memory for retentive data blocks | 256 kbyte |
| Load memory | |
| • Plug-in (MMC) | Yes |
| • Plug-in (MMC), max. | 8 Mbyte |
| • Data management on MMC (after last programming), min. | 10 y |
| Backup | |
| • present | Yes; Guaranteed by MMC (maintenance-free) |
| • without battery | Yes; Program and data |

| CPU processing times | |
|---|---|
| for bit operations, typ. | 0.025 µs |
| for word operations, typ. | 0.03 µs |
| for fixed point arithmetic, typ. | 0.04 µs |
| for floating point arithmetic, typ. | 0.16 µs |

| CPU-blocks | |
|---|---|
| Number of blocks (total) | 2 048; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used. |
| DB | |
| • Number, max. | 2 048; Number range: 1 to 16000 |
| • Size, max. | 64 kbyte |
| FB | |
| • Number, max. | 2 048; Number range: 0 to 7999 |
| • Size, max. | 64 kbyte |
| FC | |
| • Number, max. | 2 048; Number range: 0 to 7999 |
| • Size, max. | 64 kbyte |
| OB | |
| • Description | see instruction list |
| • Size, max. | 64 kbyte |


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| | |
|---|---|
| • Number of free cycle OBs | 1; OB 1 |
| • Number of time alarm OBs | 1; OB 10 |
| • Number of delay alarm OBs | 2; OB 20, 21 |
| • Number of cyclic interrupt OBs | 4; OB 32, 33, 34, 35 |
| • Number of process alarm OBs | 1; OB 40 |
| • Number of DPV1 alarm OBs | 3; OB 55, 56, 57 |
| • Number of isochronous mode OBs | 1; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) |
| • Number of technology synchronous alarm OBs | 1; OB 65 |
| • Number of startup OBs | 1; OB 100 |
| • Number of asynchronous error OBs | 6; OB 80, 82, 83, 85, 86, 87 (OB83 only for PROFINET IO) |
| • Number of synchronous error OBs | 2; OB 121, 122 |
| Nesting depth | |
| • per priority class | 16 |
| • additional within an error OB | 4 |

| Counters, timers and their retentivity | |
|---|---|
| S7 counter | |
| • Number | 512 |
| Retentivity | |
| — adjustable | Yes |
| — lower limit | 0 |
| — upper limit | 511 |
| — preset | Z 0 to Z 7 |
| Counting range | |
| — adjustable | Yes |
| — lower limit | 0 |
| — upper limit | 999 |
| IEC counter | |
| • present | Yes |
| • Type | SFB |
| • Number | Unlimited (limited only by RAM capacity) |
| S7 times | |
| • Number | 512 |
| Retentivity | |
| — adjustable | Yes |
| — lower limit | 0 |
| — upper limit | 511 |
| — preset | No retentivity |
| Time range | |
| — lower limit | 10 ms |
| — upper limit | 9 990 s |


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| | |
|---|---|
| IEC timer | |
| • present | Yes |
| • Type | SFB |
| • Number | Unlimited (limited only by RAM capacity) |
| **Data areas and their retentivity** | |
| retentive data area in total | all, max. 256 KB |
| Flag | |
| • Number, max. | 4 096 byte |
| • Retentivity preset | MB 0 to MB 15 |
| • Number of clock memories | 8; 1 memory byte |
| Data blocks | |
| • Retentivity adjustable | Yes; via non-retain property on DB |
| • Retentivity preset | Yes |
| **Address area** | |
| I/O address area | |
| • Inputs | 8 192 byte |
| • Outputs | 8 192 byte |
| Process image | |
| • Inputs | 8 192 byte |
| • Outputs | 8 192 byte |
| • Inputs, adjustable | 8 192 byte |
| • Outputs, adjustable | 8 192 byte |
| • Inputs, default | 256 byte |
| • Outputs, default | 256 byte |
| Default addresses of the integrated channels | |
| — Digital inputs | 66 |
| — Digital outputs | 66 |
| Subprocess images | |
| • Number of subprocess images, max. | 1; With PROFINET IO, the length of the user data is limited to 1600 bytes |
| Digital channels | |
| • Inputs | 65 536 |
| — of which central | 256 |
| • Outputs | 65 536 |
| — of which central | 256 |
| Analog channels | |
| • Inputs | 4 096 |
| — of which central | 64 |
| • Outputs | 4 096 |
| — of which central | 64 |
| **Hardware configuration** | |


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| | |
|---|---|
| Number of expansion units, max. | 0 |
| Number of DP masters | |
| • integrated | 2; 1 DP and 1 DP (drive) |
| • via CP | 2; for DP |
| Number of operable FMs and CPs (recommended) | |
| • FM | 8 |
| • CP, PtP | 8 |
| • CP, LAN | 8 |
| Rack | |
| • Racks, max. | 1 |
| • Modules per rack, max. | 8 |

| Time of day | |
|---|---|
| Clock | |
| • Hardware clock (real-time) | Yes |
| • retentive and synchronizable | Yes |
| • Backup time | 6 wk; At 40 °C ambient temperature |
| • Deviation per day, max. | 10 s; Typ.: 2 s |
| • Behavior of the clock following POWER-ON | Clock continues running after POWER OFF |
| • Behavior of the clock following expiry of backup period | Clock continues to run with the time at which the power failure occurred |
| Operating hours counter | |
| • Number | 4 |
| • Number/Number range | 0 to 3 |
| • Range of values | 0 to 2^31 hours (when using SFC 101) |
| • Granularity | 1 h |
| • retentive | Yes; Must be restarted at each restart |
| Clock synchronization | |
| • supported | Yes |
| • to MPI, master | Yes |
| • to MPI, slave | Yes |
| • in AS, master | Yes |
| • in AS, slave | Yes |

| Digital inputs | |
|---|---|
| Number of digital inputs | 4 |
| • of which inputs usable for technological functions | 4 |
| Input characteristic curve in accordance with IEC 61131, type 1 | Yes |
| Number of simultaneously controllable inputs | |
| horizontal installation | |
| — up to 40 °C, max. | 4 |


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| | |
|---|---|
| — up to 60 °C, max. | 4 |
| vertical installation | |
| — up to 40 °C, max. | 4 |
| Input voltage | |
| • Rated value (DC) | 24 V |
| • for signal "0" | -3 to +5V |
| • for signal "1" | +15 to +30 V |
| Input current | |
| • for signal "1", typ. | 7 mA |
| Input delay (for rated value of input voltage) | |
| for technological functions | |
| — at "0" to "1", max. | 10 µs; Typical |
| — at "1" to "0", max. | 10 µs; Typical |
| Cable length | |
| • shielded, max. | 1 000 m |

| Digital outputs | |
|---|---|
| Number of digital outputs | 8 |
| • of which high-speed outputs | 8 |
| Functions | For technology functions, e.g. high-speed cam switch signals |
| Short-circuit protection | Yes |
| • Response threshold, typ. | 1 A |
| Limitation of inductive shutdown voltage to | 48 V |
| Controlling a digital input | No |
| Switching capacity of the outputs | |
| • on lamp load, max. | 5 W |
| Load resistance range | |
| • lower limit | 48 Ω |
| • upper limit | 4 kΩ |
| Output voltage | |
| • for signal "0", max. | 3 V; (2L+) |
| • for signal "1", min. | Rated voltage -2.5 V |
| Output current | |
| • for signal "1" rated value | 0.5 A |
| • for signal "1" permissible range for 0 to 60 °C, min. | 5 mA |
| • for signal "1" permissible range for 0 to 60 °C, max. | 0.6 A |
| • for signal "0" residual current, max. | 0.3 mA |
| Parallel switching of two outputs | |
| • for uprating | No |
| • for redundant control of a load | No |
| Switching frequency | |


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| | |
|---|---|
| • with resistive load, max. | 100 Hz |
| • with inductive load, max. | 0.2 Hz; According to IEC 60947-5-1, DC-13 |
| • on lamp load, max. | 100 Hz |
| Total current of the outputs (per group) | |
| horizontal installation | |
| — up to 40 °C, max. | 4 A |
| — up to 60 °C, max. | 3 A |
| all other mounting positions | |
| — up to 40 °C, max. | 4 A |
| Integrated high-speed cams | |
| • Switching accuracy (+/-) | 70 µs |
| Cable length | |
| • shielded, max. | 1 000 m |
| **Analog inputs** | |
| Number of analog inputs | 0 |
| **Analog outputs** | |
| Number of analog outputs | 0 |
| **Encoder** | |
| Connectable encoders | |
| • 2-wire sensor | No |
| **Interfaces** | |
| Number of industrial Ethernet interfaces | 1 |
| Number of PROFINET interfaces | 1 |
| Number of RS 485 interfaces | 2 |
| Number of RS 422 interfaces | 0 |
| **1. Interface** | |
| Interface type | Integrated RS 485 interface |
| Physics | RS 485 |
| Isolated | Yes |
| Power supply to interface (15 to 30 V DC), max. | 200 mA |
| Protocols | |
| • MPI | Yes |
| • PROFIBUS DP master | Yes |
| • PROFIBUS DP slave | Yes |
| • Point-to-point connection | No |
| MPI | |
| • Transmission rate, max. | 12 Mbit/s |
| Services | |
| — PG/OP communication | Yes |
| — Routing | Yes |


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| | |
|---|---|
| — Global data communication | Yes |
| — S7 basic communication | Yes |
| — S7 communication | Yes |
| — S7 communication, as client | No; but via CP and loadable FB |
| — S7 communication, as server | Yes |
| PROFIBUS DP master | |
| • Transmission rate, max. | 12 Mbit/s |
| • Number of DP slaves, max. | 124 |
| 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 | Yes; OB 61; isochronous mode can only be used alternatively on PROFIBUS DP or PROFINET IO |
| — SYNC/FREEZE | Yes |
| — Activation/deactivation of DP slaves | Yes |
| — Number of DP slaves that can be simultaneously activated/deactivated, max. | 8 |
| — Direct data exchange (slave-to-slave communication) | Yes; as subscriber |
| — DPV1 | Yes |
| Address area | |
| — Inputs, max. | 8 kbyte |
| — Outputs, max. | 8 kbyte |
| User data per DP slave | |
| — Inputs, max. | 244 byte |
| — Outputs, max. | 244 byte |
| PROFIBUS DP slave | |
| • Transmission rate, max. | 12 Mbit/s |
| • automatic baud rate search | Yes; only with passive interface |
| • Address area, max. | 32 |
| • User data per address area, max. | 32 byte |
| Services | |
| — PG/OP communication | Yes |
| — Routing | Yes; Only with active interface |
| — Global data communication | No |
| — S7 basic communication | No |


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| | |
|---|---|
| — S7 communication | Yes |
| — S7 communication, as client | No |
| — S7 communication, as server | Yes; Connection configured on one side only |
| — Direct data exchange (slave-to-slave communication) | Yes |
| — DPV1 | No |
| Transfer memory | |
| — Inputs | 244 byte |
| — Outputs | 244 byte |

| 2. Interface | |
|---|---|
| Interface type | Integrated RS 485 interface |
| Physics | RS 485 |
| Isolated | Yes |
| Power supply to interface (15 to 30 V DC), max. | 200 mA |
| Protocols | |
| • MPI | No |
| • PROFIBUS DP master | Yes; DP(DRIVE)-Master |
| • PROFIBUS DP slave | No |
| • Point-to-point connection | No |
| PROFIBUS DP master | |
| • Transmission rate, max. | 12 Mbit/s |
| • Number of DP slaves, max. | 64 |
| Services | |
| — PG/OP communication | No |
| — Routing | No |
| — Global data communication | No |
| — S7 basic communication | No |
| — S7 communication | No |
| — Equidistance | Yes |
| — Isochronous mode | Yes |
| — SYNC/FREEZE | No |
| — Activation/deactivation of DP slaves | Yes |
| — DPV1 | No |
| Address area | |
| — Inputs, max. | 1 024 byte |
| — Outputs, max. | 1 024 byte |
| User data per DP slave | |
| — Inputs, max. | 244 byte |
| — Outputs, max. | 244 byte |
| PROFIBUS DP slave | |
| • GSD file | http://support.automation.siemens.com in Product Support area |


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| | |
|---|---|
| • Transmission rate, max. | 12 Mbit/s |

| 3. Interface | |
|---|---|
| Interface type | PROFINET |
| Physics | Ethernet RJ45 |
| Isolated | Yes |
| automatic detection of transmission rate | Yes; 10/100 Mbit/s |
| Autonegotiation | Yes |
| Autocrossing | Yes |
| Change of IP address at runtime, supported | Yes |
| Interface types | |
| • Number of ports | 2 |
| • integrated switch | Yes |
| Protocols | |
| • MPI | No |
| • PROFINET IO Controller | Yes; Also simultaneously with IO-Device functionality |
| • PROFINET IO Device | Yes; Also simultaneously with IO Controller functionality |
| • PROFIBUS DP master | No |
| • PROFIBUS DP slave | No |
| • Open IE communication | Yes; Via TCP/IP, ISO on TCP, and UDP |
| • Web server | Yes |
| PROFINET IO Controller | |
| • Transmission rate, max. | 100 Mbit/s |
| Services | |
| — PG/OP communication | Yes |
| — Routing | Yes |
| — S7 communication | Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 |
| — Isochronous mode | Yes; OB 61; isochronous mode can only be used alternatively on PROFIBUS DP or PROFINET IO |
| — Shared device | Yes |
| — Prioritized startup | Yes |
| — Number of IO devices with prioritized startup, max. | 32 |
| — Number of connectable IO Devices, max. | 128 |
| — Of which IO devices with IRT, max. | 64 |
| — of which in line, max. | 64 |
| — Number of connectable IO Devices for RT, max. | 128 |
| — of which in line, max. | 128 |
| — Activation/deactivation of IO Devices | Yes |
| — Number of IO Devices that can be simultaneously activated/deactivated, max. | 8 |


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| | |
|---|---|
| — IO Devices changing during operation (partner ports), supported | Yes |
| — Number of IO Devices per tool, max. | 8 |
| — Device replacement without swap medium | Yes |
| — Send cycles | 250 µs, 500 µs, 1 ms, 2 ms, 4 ms |
| — Updating time | 250 µs to 512 ms (depending on the operating mode, see Manual "S7-300 CPU 31xC and CPU 31x, technical Data" for more details) |
| Address area | |
| — Inputs, max. | 8 kbyte |
| — Outputs, max. | 8 kbyte |
| — User data consistency, max. | 1 024 byte |
| PROFINET IO Device | |
| Services | |
| — PG/OP communication | Yes |
| — Routing | Yes |
| — S7 communication | Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 |
| — Isochronous mode | No |
| — IRT | Yes |
| — PROFIenergy | Yes; With SFB 73 / 74 prepared for loadable PROFIenergy standard FB for I-Device |
| — Shared device | Yes |
| — Number of IO Controllers with shared device, max. | 2 |
| Transfer memory | |
| — Inputs, max. | 1 440 byte; Per IO Controller with shared device |
| — Outputs, max. | 1 440 byte; Per IO Controller with shared device |
| Submodules | |
| — Number, max. | 64 |
| — User data per submodule, max. | 1 024 byte |
| Open IE communication | |
| • Number of connections, max. | 16 |
| • Local port numbers used at the system end | 0, 20, 21, 23, 25, 80, 102, 135, 161, 443, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535 |
| • Keep-alive function, supported | Yes |
| Protocols | |
| Redundancy mode | |
| Media redundancy | |
| — Switchover time on line break, typ. | 200 ms; PROFINET MRP |
| — Number of stations in the ring, max. | 50 |
| Open IE communication | |


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|---|---|
| • TCP/IP | Yes; via integrated PROFINET interface and loadable FBs |
| — Number of connections, max. | 16 |
| — Data length for connection type 01H, max. | 1 460 byte |
| — Data length for connection type 11H, max. | 32 768 byte |
| — several passive connections per port, supported | Yes |
| • ISO-on-TCP (RFC1006) | Yes; via integrated PROFINET interface and loadable FBs |
| — Number of connections, max. | 16 |
| — Data length, max. | 32 768 byte |
| • UDP | Yes; via integrated PROFINET interface and loadable FBs |
| — Number of connections, max. | 16 |
| — Data length, max. | 1 472 byte |
| Web server | |
| • supported | Yes |
| • User-defined websites | Yes |
| • Number of HTTP clients | 5 |

| Isochronous mode | |
|---|---|
| Isochronous operation (application synchronized up to terminal) | Yes; Via PROFIBUS DP or PROFINET interface |

| Communication functions | |
|---|---|
| PG/OP communication | Yes |
| Data record routing | Yes |
| Global data communication | |
| • supported | Yes |
| • Number of GD loops, max. | 8 |
| • Number of GD packets, max. | 8 |
| • Number of GD packets, transmitter, max. | 8 |
| • Number of GD packets, receiver, max. | 8 |
| • Size of GD packets, max. | 22 byte |
| • Size of GD packet (of which consistent), max. | 22 byte |
| S7 basic communication | |
| • supported | Yes |
| • User data per job, max. | 76 byte |
| • User data per job (of which consistent), max. | 76 byte; 76 bytes (with X_SEND or X_RCV); 64 bytes (with X_PUT or X_GET as server) |
| S7 communication | |
| • supported | Yes |
| • as server | Yes |
| • as client | Yes; via integrated PROFINET interface and loadable FB or via CP and loadable FB |
| • User data per job, max. | See online help of STEP 7 (shared parameters of the SFBs/FBs and of the SFCs/FCs of S7 Communication) |


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| | |
|---|---|
| S5 compatible communication | |
| • supported | Yes; via CP and loadable FC |
| Number of connections | |
| • overall | 32 |
| • usable for PG communication | 31 |
| — reserved for PG communication | 1 |
| — adjustable for PG communication, min. | 1 |
| — adjustable for PG communication, max. | 31 |
| • usable for OP communication | 31 |
| — reserved for OP communication | 1 |
| — adjustable for OP communication, min. | 1 |
| — adjustable for OP communication, max. | 31 |
| • usable for S7 basic communication | 30 |
| — reserved for S7 basic communication | 0 |
| — adjustable for S7 basic communication, min. | 0 |
| — adjustable for S7 basic communication, max. | 30 |
| • usable for S7 communication | 16 |
| — reserved for S7 communication | 0 |
| — adjustable for S7 communication, min. | 0 |
| — adjustable for S7 communication, max. | 16 |
| • total number of instances, max. | 32 |
| • usable for routing | X1 as MPI: max. 10; X1 as DP master: max. 24; X1 as DP slave (active): max. 14; X2 as PROFINET: 24 max. |

| S7 message functions | |
|---|---|
| Number of login stations for message functions, max. | 32; Depending on the configured connections for PG/OP and S7 basic communication |
| Process diagnostic messages | Yes |
| simultaneously active Alarm-S blocks, max. | 300 |

| Test commissioning functions | |
|---|---|
| Status block | Yes; Up to 2 simultaneously |
| Single step | Yes |
| Number of breakpoints | 4; without continuation |
| 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 |


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| | |
|---|---|
| • Forcing, variables | Inputs, outputs |
| • Number of variables, max. | 10 |
| Diagnostic buffer | |
| • present | Yes |
| • Number of entries, max. | 500 |
| — adjustable | No |
| — of which powerfail-proof | 100; Only the last 100 entries are retained |
| • Number of entries readable in RUN, max. | 499 |
| — adjustable | Yes; From 10 to 499 |
| — preset | 10 |
| Service data | |
| • can be read out | Yes |
| **Interrupts/diagnostics/status information** | |
| Alarms | No |
| Diagnostics function | No |
| Diagnostics indication LED | |
| • Status indicator digital input (green) | Yes |
| • Status indicator digital output (green) | Yes |
| **Potential separation** | |
| Potential separation digital inputs | |
| • between the channels and backplane bus | Yes |
| Potential separation digital outputs | |
| • between the channels and backplane bus | Yes |
| **Isolation** | |
| Isolation tested with | 500 V DC |
| **Ambient conditions** | |
| Ambient temperature during operation | |
| • min. | 0 °C |
| • max. | 60 °C |
| **Configuration** | |
| Configuration software | |
| • STEP 7 | Yes; STEP 7 V5.5 SP2 or higher and S7-Technology option package V4.2 SP3 |
| 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 |


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| | |
|---|---|
| — FBD | Yes |
| — STL | Yes |
| — SCL | Yes |
| — CFC | Yes |
| — GRAPH | Yes |
| — HiGraph® | Yes |
| **Know-how protection** | |
| • User program protection/password protection | Yes |
| • Block encryption | Yes; With S7 block Privacy |

| **Dimensions** | |
|---|---|
| Width | 120 mm |
| Height | 125 mm |
| Depth | 130 mm |

| **Weights** | |
|---|---|
| Weight, approx. | 640 g |

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