# Manual ball lock series

Complete quick change positioning locking system



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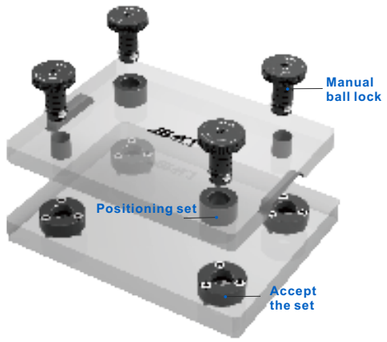
## Manual ball lock series

## Manual ball lock quick clamping principle:

※ Main components: receiving sleeve (placed in the base plate), positioning sleeve (placed in the tray), manual ball lock;
※ Main purpose: It can quickly and accurately complete the positioning and locking of complete sets of fixtures; Can be used for quick replacement of small batches and multiple varieties of workpieces.




**Product Features：**

- ◆ Quick: Complete fixture replacement only takes up to 1 minute;
- ◆ Repetitive positioning accuracy: within ± 0.013mm;
- ◆ Clamping force: The maximum load-bearing capacity of the complete set of ball locks is 36 tons;
- ◆ Easy to operate: One step locking and positioning implementation;
- ◆ Low cost: Only one set of base board is needed, and the trays can be infinitely replaced to process different products;
- ◆ Maintenance: Parts are interconnected and interchangeable.

## Principle diagram of ball lock:

STEP 1

1) Lock the formal suit receiving sleeve onto the base plate with screws; Or insert the back mounted type into the through hole of the base plate (interference fit).

2) Permanently install the foundation board on the workbench.

3) Process four holes on the fixture board (the aperture depends on the diameter series of the ball lock, and the hole spacing depends on the tray size and installation space allowance), select any two diagonal holes to install the ball lock positioning sleeve, and the remaining two through holes are matched with the ball lock to form a gap for clamping.

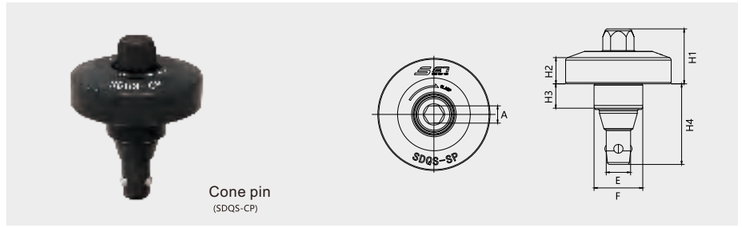
STEP 2

1) Align the four mating holes of the tray with the positions of the four receiving sleeves on the base plate.

2) Insert the ball lock and rotate the screw with an Allen wrench that matches the size of the ball lock screw, causing the screw to move downward. The conical surface of the screw is tangent to the three steel balls at the bottom.

STEP 3

1) When the conical surface of the screw, the steel ball, and the positioning sleeve are tangent, the positioning and locking are completed, so that the tray and the base plate are firmly locked together.




## Manual ball lock

### Product features:

- Manual clamping and unlocking;
- Material: Stainless steel (or customer's choice);
- Surface and screw hardening treatment.

### Applicable industry:

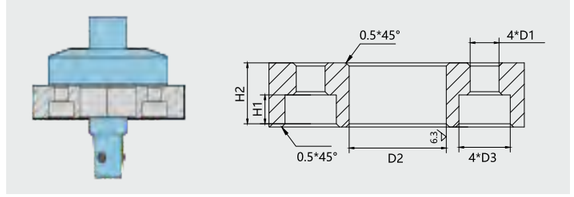
- Suitable for metal or non-metal processing fields.

**Main parameter table：**

| Order Number | Supporting set | clamping force (kN) | Allowable tightening torque (N·m) | Unlocking method | Weight(g) |
|---|---|---|---|---|---|
| SDQS-5-CP | SDQS-5-C | 1.7 | 2 | Manual operation | 134 |
| SDQS-5-SP | SDQS-5-S | | | | 133 |
| SDQS-10-CP | SDQS-10-C | 3 | 4 | | 241 |
| SDQS-10-SP | SDQS-10-S | | | | 239 |
| SDQS-20-CP | SDQS-20-C | 4.5 | 7 | | 457 |
| SDQS-20-SP | SDQS-20-S | | | | 453 |

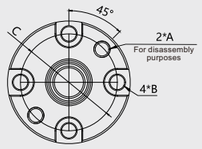
| Order Number | A | B | C | D | E | F (g6) | G (-0.02 -0.06) | H1 | H2 | H3 | H4 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SDQS-5-CP | 10 | 30 | M4*0.7↧6 | 39 | 9 | 18 | / | 22 | 12 | 9.5 | 30 |
| SDQS-5-SP | | | | | | / | 18 | | | | |
| SDQS-10-CP | 13 | 37 | | 46 | 12 | 22 | / | 27 | 14 | 14.5 | 40 |
| SDQS-10-SP | | | | | | / | 22 | | | | |
| SDQS-20-CP | 17 | 45 | M5*0.8↧7 | 56 | 16 | 28 | / | 34 | 16 | 19.5 | 51 |
| SDQS-20-SP | | | | | | / | 28 | | | | |

## Installation dimension diagram




| Order Number | D1 | D2 (H7) | D3 | H1 | H2 (±0.05) |
|---|---|---|---|---|---|
| SDQS-5-CP SDQS-5-SP | 4.5 | 18 | 8 | 5 | 10 |
| SDQS-10-CP SDQS-10-SP | | 22 | | 10 | 15 |
| SDQS-20-CP SDQS-20-SP | 5.5 | 28 | 10 | 14 | 20 |

Cone acceptance sleeve (SDQS-C)




Straight column receiving sleeve (SDQS-S)


## Ball lock receiving sleeve

**Product features:**

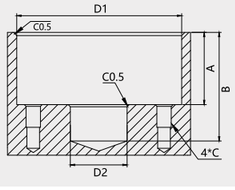
- Body: Iron oxide film quenched and tempered;
- Cone sleeve salt bath soft nitriding treatment.

**Main parameter table:**

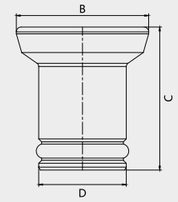
| Order Number | Type | A | B | C | D (g6) | E | F | Lifting force (N) | Weight(g) |
|---|---|---|---|---|---|---|---|---|---|
| SDQS-5-C | Cone acceptance sleeve | M5*0.8 | 4.5 | 30 | 38 | 10 | 15 | 300 | 100 |
| SDQS-5-S | Straight column receiving sleeve | | | | | | | — | 101 |
| SDQS-10-C | Cone acceptance sleeve | M6*1 | | 37 | 45 | 14 | 19 | 450 | 179 |
| SDQS-10-S | Straight column receiving sleeve | | | | | | | — | 184 |
| SDQS-20-C | Cone acceptance sleeve | | 5.5 | 45 | 55 | 18 | 24 | 680 | 337 |
| SDQS-20-S | Straight column receiving sleeve | | | | | | | — | 341 |

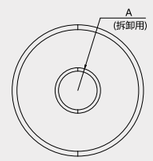
Note: The lifting force refers to the force exerted by the built-in spring of the body to lift the movable conical sleeve

## Ball lock installation hole processing and installation dimension diagram:




| Order Number | D1 (H7) | D2 | A (±0.05) | B | C |
|---|---|---|---|---|---|
| SDQS-5-C/S | 38 | 13 | 15.5 | 23 | M4 |
| SDQS-10-C/S | 45 | 16 | 19.5 | 28 | |
| SDQS-20-C/S | 55 | 20 | 24.5 | 34 | M5 |




## Ball lock protective cover

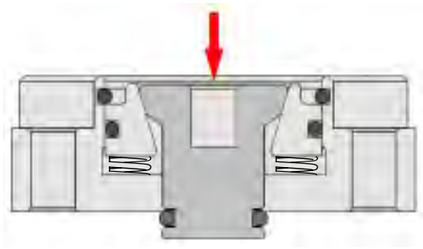
**Product features:**

- Material: Aluminum oxide;
- Prevent debris from entering the positioning cone.

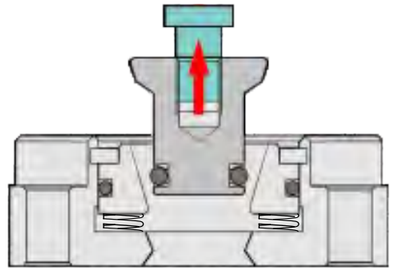
**Main parameter table:**

| Order Number | A | B | C | D | Weight(g) | Supporting set | |
|---|---|---|---|---|---|---|---|
| SDQS-5-B | M4 | 13.5 | 15 | 9 | 3 | SDQS-5-C | SDQS-5-S |
| SDQS-10-B | | 17 | 19 | 12 | 6 | SDQS-10-C | SDQS-10-S |
| SDQS-20-B | M5 | 23 | 22.5 | 16 | 14 | SDQS-20-C | SDQS-20-S |

**Installation method of protective plug:**



**Disassembly method of protective plug:**



## Positioning locking ball lock

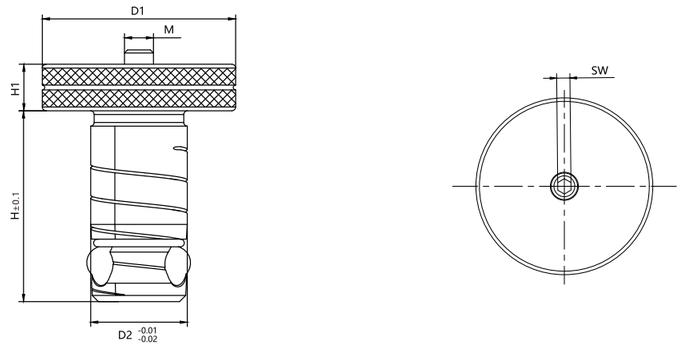
### Product features:

- Manual quick opening and locking;
- Material: Hardened alloy steel;
- Surface and screw hardening treatment;
- Repetitive positioning accuracy<± 0.013mm;
- Used in conjunction with the receiving set and positioning set, it can accurately switch workpiece trays within seconds;
- Maximized the utilization of the workbench.

### Applicable industry:

- Suitable for metal or non-metal processing fields.

### Outline dimensions:




### Main parameter table:

| Order Number | Clamping force (kN) | Tightening torque (N·m) | Transition plate thickness+0.13 | Ø D1 | Ø D2 | H | H1 | M | SW | Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|
| QSP-16020 | 5.3 | 4.5 | 20 | 32 | 16 | 36.5 | 8 | M6 | 3 | 100 |
| QSP-16025 | 5.3 | 4.5 | 25 | 32 | 16 | 41.5 | 8 | M6 | 3 | 110 |
| QSP-20020 | 13.3 | 5.3 | 20 | 40 | 20 | 39.5 | 10 | M6 | 3 | 200 |
| QSP-20025 | 13.3 | 5.3 | 25 | 40 | 20 | 44.5 | 10 | M6 | 3 | 230 |
| QSP-25020 | 30 | 11 | 20 | 45 | 25 | 44 | 10 | M8 | 4 | 270 |
| QSP-25025 | 30 | 11 | 25 | 45 | 25 | 49 | 10 | M8 | 4 | 300 |
| QSP-30020 | 44 | 18 | 20 | 50 | 30 | 49 | 13 | M10 | 5 | 360 |
| QSP-30025 | 44 | 18 | 25 | 50 | 30 | 54 | 13 | M10 | 5 | 400 |



## Adjustable handle ball lock

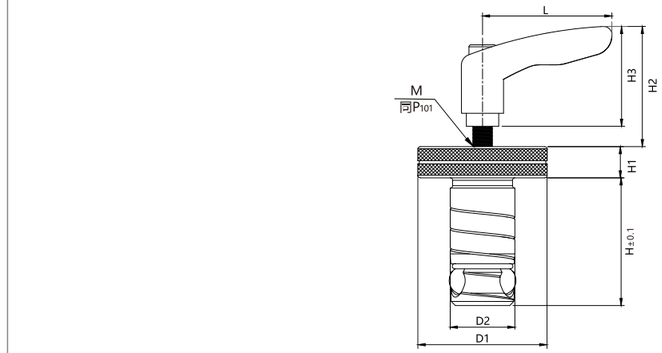
### Product features:

- Manual quick opening and locking;
- Material: Hardened alloy steel;
- Surface and screw hardening treatment;
- Repetitive positioning accuracy<± 0.013mm;
- Used in conjunction with the receiving sleeve and positioning sleeve, it can accurately switch workpiece trays within seconds;
- Maximized the utilization of the workbench.

### Applicable industry:

- Suitable for metal or non-metal processing fields.

### Outline dimensions:




### Main parameter table:

| Order Number | Clamping force (kN) | Tightening torque (N·m) | Transition plate thickness+0.13 | Ø D1 | Ø D2 | H | H1 | H2 (min) | H3 | L | Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| QSB-16020 | 5.3 | 4.5 | 20 | 32 | 16 | 36.5 | 8 | 38.5 | 31 | 40 | 140 |
| QSB-16025 | 5.3 | 4.5 | 25 | 32 | 16 | 41.5 | 8 | 33.5 | 31 | 40 | 150 |
| QSB-20020 | 13.3 | 5.3 | 20 | 40 | 20 | 39.5 | 10 | 37.5 | 31 | 40 | 240 |
| QSB-20025 | 13.3 | 5.3 | 25 | 40 | 20 | 44.5 | 10 | 37.5 | 31 | 40 | 270 |
| QSB-25020 | 30 | 11 | 20 | 45 | 25 | 44 | 10 | 48.5 | 42.5 | 65 | 360 |
| QSB-25025 | 30 | 11 | 25 | 45 | 25 | 49 | 10 | 48.5 | 42.5 | 65 | 390 |
| QSB-30020 | 44 | 18 | 20 | 50 | 30 | 49 | 13 | 71 | 54 | 80 | 470 |
| QSB-30025 | 44 | 18 | 25 | 50 | 30 | 54 | 13 | 71 | 54 | 80 | 500 |

## Finger screw type ball lock

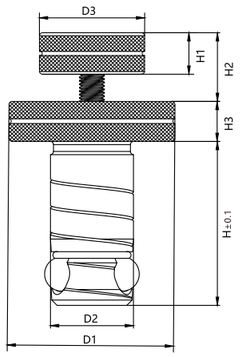
### Product features:

- Manual quick opening and locking;
- Material: Hardened alloy steel;
- Surface and screw hardening treatment;
- Repetitive positioning accuracy<± 0.013mm;
- Used in conjunction with the receiving set and positioning set, it can accurately switch workpiece trays within seconds;
- Maximized the utilization of the workbench.

### Applicable industry:

- Suitable for metal or non-metal processing fields.

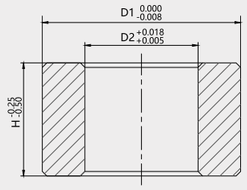
### Outline dimensions:




### Main parameter table:

| Order Number | Clamping force (kN) | Tightening torque (N·m) | Transition plate thickness+0.13 | Ø D1 | Ø D2 | Ø D3 | H | H1 | H2 (min) | H3 | Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| QZX-16020 | 5.3 | 4.5 | 20 | 32 | 16 | 25 | 36.5 | 10 | 17.5 | 8 | 135 |
| QZX-16025 | 5.3 | 4.5 | 25 | 32 | 16 | 25 | 41.5 | 10 | 22.5 | 8 | 140 |
| QZX-20020 | 13.3 | 5.3 | 20 | 40 | 20 | 25 | 39.5 | 10 | 16.5 | 10 | 210 |
| QZX-20025 | 13.3 | 5.3 | 25 | 40 | 20 | 25 | 44.5 | 10 | 21.5 | 10 | 225 |
| QZX-25020 | 30 | 11 | 20 | 45 | 25 | 30 | 44 | 10 | 16 | 10 | 345 |
| QZX-25025 | 30 | 11 | 25 | 45 | 25 | 30 | 49 | 10 | 21 | 10 | 360 |
| QZX-30020 | 44 | 18 | 20 | 50 | 30 | 30 | 49 | 10 | 16 | 13 | 440 |
| QZX-30025 | 44 | 18 | 25 | 50 | 30 | 30 | 54 | 10 | 21 | 13 | 465 |






- Note: The repeated positioning accuracy will determine whether one first level and one second level positioning set are needed, or whether two first level positioning sets are needed in total. When using two first level positioning sleeves, if the center distance between the two holes is within a tolerance range of+0.005mm, the repeated positioning accuracy can be maintained within ± 0.013mm.

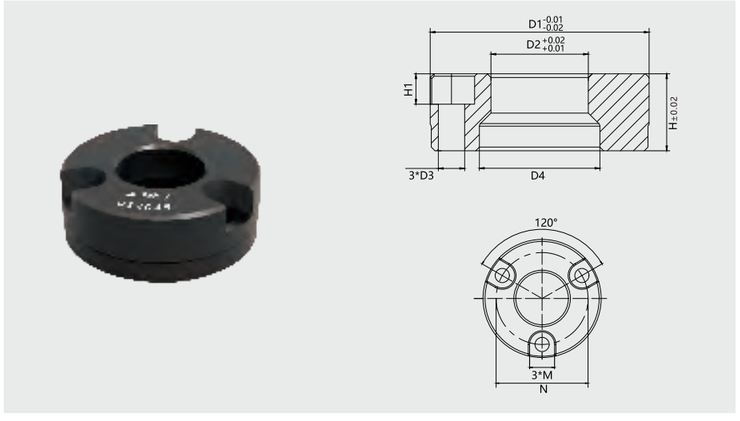
## Positioning set

### Product features:

- Material: Hardened alloy steel;
- Repetitive positioning accuracy <± 0.013mm;
- Place the positioning sleeve in the fixture switching board and use it in conjunction with the ball lock and receiving sleeve.

### Main parameter table:

| Order number | | ØD1 | ØD2 | | H | Weight (g) |
|---|---|---|---|---|---|---|
| First level positioning set | Secondary positioning set | | First level posi -tioning set | Secondary posi -tioning set | | |
| DW16201 | DW16202 | 25.04 | 16.01 | 16.04 | 20 | 46 |
| DW16251 | DW16252 | 25.04 | 16.01 | 16.04 | 25 | 59 |
| DW20201 | DW20202 | 35.04 | 20.01 | 20.04 | 20 | 102 |
| DW20251 | DW20252 | 35.04 | 20.01 | 20.04 | 25 | 127 |
| DW25201 | DW25202 | 35.04 | 25.01 | 25.04 | 20 | 74 |
| DW25251 | DW25252 | 35.04 | 25.01 | 25.04 | 25 | 91 |
| DW30201 | DW30202 | 45.04 | 30.01 | 30.04 | 20 | 138 |
| DW30251 | DW30252 | 45.04 | 30.01 | 30.04 | 25 | 173 |




## Formal style receiving set

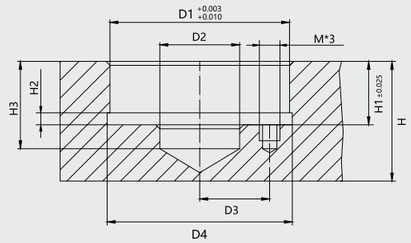
**Product features:**

- Body: Iron oxide film quenched and tempered.

**Main parameter table:**

| | ØD1 | ØD2 | ØD3 | ØD4 | H | H1 | M | ØN | Weight (g) |
|---|---|---|---|---|---|---|---|---|---|
| JS1637 | 37 | 16 | 4.5 | 20.65 | 11.56 | 4.6 | 7.6 | 29 | 60 |
| JS2045 | 45 | 20 | 5.4 | 24.77 | 15.8 | 6.2 | 9.5 | 35 | 140 |
| JS2555 | 55 | 25 | 6.4 | 30.35 | 19.94 | 7.3 | 11 | 42 | 200 |
| JS3060 | 60 | 30 | 6.4 | 36.2 | 21.77 | 7.3 | 11 | 48 | 305 |

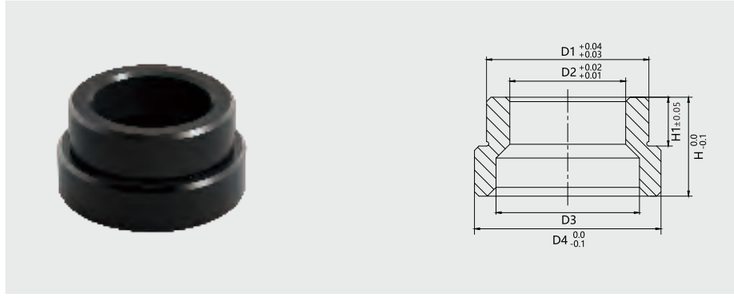
## Installation dimension diagram of formal type receiving sleeve:




**Main parameter table:**

| Order Number | Ø D1 | Ø D2 | D3 | Ø D4 | Transition plate thickness H (min) | H1 | H2 | H3 | M |
|---|---|---|---|---|---|---|---|---|---|
| JS1637 | 37 | 21 | 14.5 | 37 | 20 | 11.91 | 3 | 20 | M4*7 |
| JS2045 | 45 | 21 | 17.5 | 45 | 25 | 16.21 | 3 | 25 | M5*9 |
| JS2555 | 55 | 25.5 | 21 | 55 | 25 | 20.32 | 3 | 25 | M6*10 |
| JS3060 | 60 | 30.5 | 24 | 60 | 30 | 22.15 | 3 | 30 | M6*11 |






## Back mounted receiving set

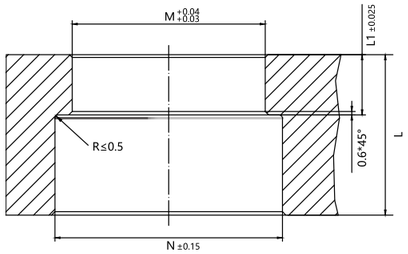
**Product features:**

- Body: Iron oxide film quenched and tempered.

**Main parameter table:**

| Order Number | ØD1 | ØD2 | ØD3 | ØD4 | H | H1 | Weight (g) |
|---|---|---|---|---|---|---|---|
| JT1629 | 22 | 16 | 20.65 | 28.6 | 12.1 | 6.9 | 20 |
| JT2032 | 28 | 20 | 24.77 | 32.2 | 17.1 | 8.4 | 50 |
| JT2540 | 35 | 25 | 30.35 | 40.2 | 21 | 10.3 | 80 |
| JT3048 | 42 | 30 | 36.2 | 48.2 | 21.8 | 10.7 | 125 |

## Back mounted type receiving sleeve installation dimension diagram:




| Order Number | Ø M | Ø N | Transition plate thickness H (min) | L1 |
|---|---|---|---|---|
| JT1629 | 22 | 29 | 20 | 7.24 |
| JT2032 | 28 | 33 | 25 | 8.74 |
| JT2540 | 35 | 41 | 25 | 10.54 |
| JT3048 | 42 | 49 | 30 | 10.95 |