



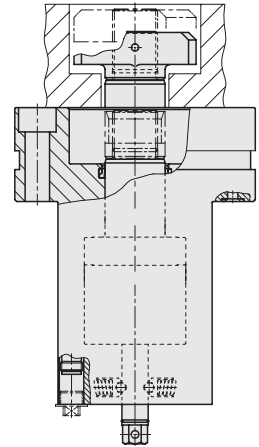
Swing Sink Clamps

with 90° swing angle, clamping force from 60 to 412 kN
 double acting, max. operating pressure 400 bar



Advantages

- Ideal force transmission
- Compact design
- Clamping force from 60 up to 412 kN
- High operating safety by position monitoring, manual emergency operation and overload protection
- Suitable for large clamping edge tolerances (± 1.5 mm)
- No colliding edges when inserting the dies
- Optimum use of ram and bed surfaces
- Clamping at difficultly accessible points



Application

Swing sink clamps are installed in press rams or press beds, in machine tools and plants. Thanks to the compact design, they are particularly suitable where space is limited. Use at ambient temperatures up to max. 70 °C.

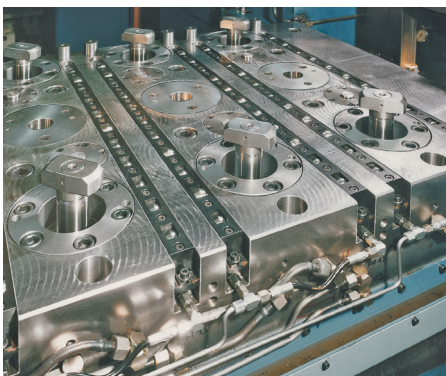
Description

Double-acting swing sink clamp with 90° swing angle. The piston is guided by a control bolt so that during the stroke movement a rotation of 45° is effected.

Monitoring of the unclamping, change-over and clamping positions by inductive proximity switches.

The swing mechanism is protected by a spring-loaded overload protection and equipped with manual emergency operation. Tie rod, piston and swing mechanism are hardened.

Application example

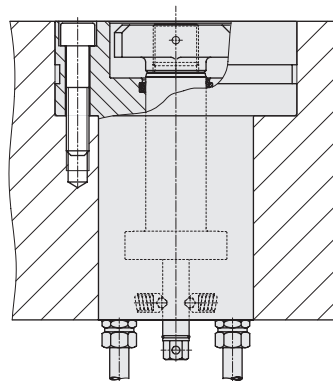


Swing sink clamps in a double-column press
 The tie rod is extended (swing position). Die positioning is made by lateral stops. Easy feeding of dies by hydraulic roller bars installed in the T-slots.

Connecting possibilities

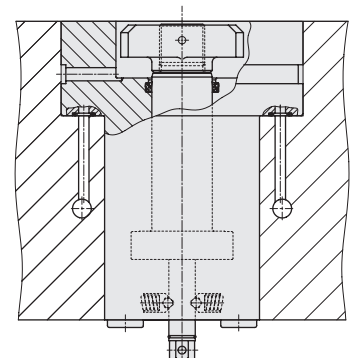
Two alternatives are offered for connecting the swing sink clamps.

Pipe connection



Pipes are recommended in applications where fittings are easily accessible and where pipes do not impede installation and dismantling of the swing sink clamps.

Manifold-mounting connection



Hydraulic oil is fed through the drilled holes in the bed and in the ram. There are no exposed pipes or fittings. The sealing is made by O-rings supplied with the clamping element.
 Easy installation, ease of servicing

Accessories

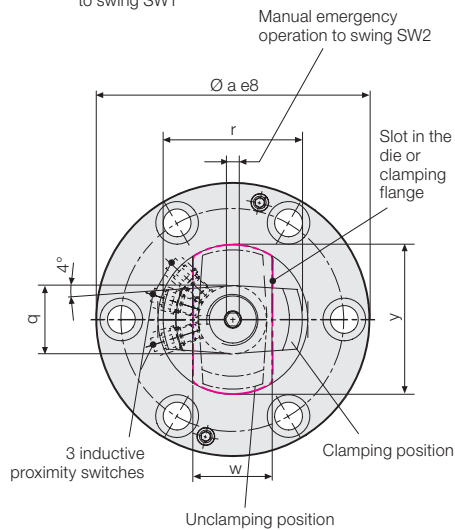
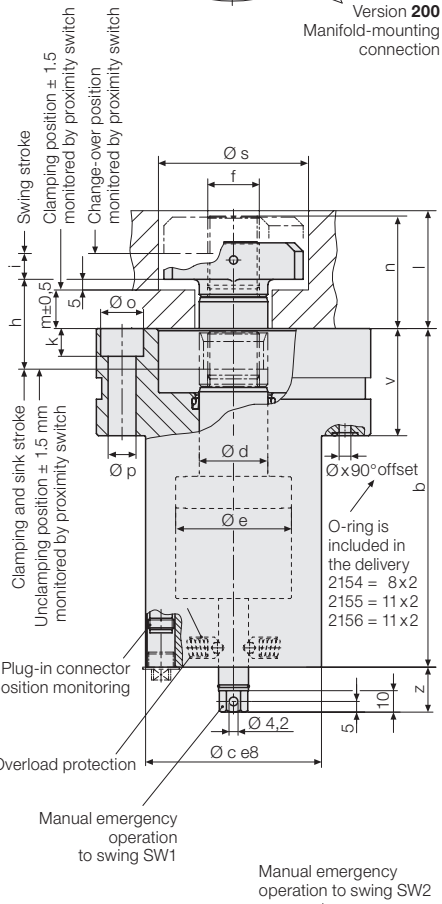
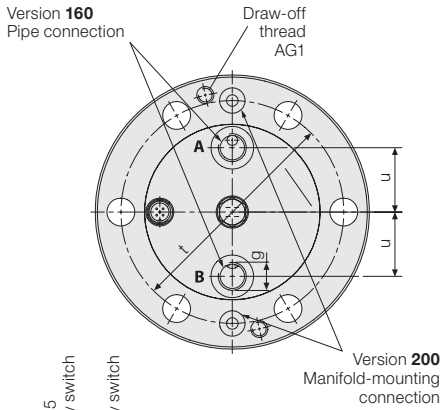
Flange as clamping point
 for installation in press dies
 see page 3

Electrical accessories
 see page 5

Hydraulic power units
 see product group 7

Hydraulic accessories
 see product group 11

Technical data Dimensions



Technical data
Max. operating pressure 400 bar

| Clamping force at 400 bar | [kN] | 60 | 104 | 164 | 256 | 412 |
|----------------------------------|----------------------|---------|---------|---------|---------|---------|
| Clamping force at 100 bar | [kN] | 15 | 26 | 41 | 64 | 103 |
| Piston Ø e | [mm] | 54 | 70 | 88 | 110 | 140 |
| Rod Ø d | [mm] | 32 | 40 | 50 | 63 | 80 |
| Swing stroke i | [mm] | 12 | 15 | 21 | 25 | 32 |
| Clamping and sink stroke h | [mm] | 42 | 54 | 65 | 75 | 89 |
| Oil volume clamping | [cm ³] | 150 | 318 | 630 | 1142 | 2244 |
| Oil volume unclamping | [cm ³] | 120 | 256 | 512 | 925 | 1816 |
| Max. flow rate | [cm ³ /s] | 15 | 32 | 63 | 150 | 200 |
| a | [mm] | 128 | 160 | 192 | 238 | 292 |
| b | [mm] | 158 | 197 | 242 | 301 | 348 |
| c | [mm] | 82 | 104 | 126 | 160 | 200 |
| f | [mm] | M24x1.5 | M30x1.5 | M36x1.5 | M45x1.5 | M58x1.5 |
| g | | G 1/4 | G 3/8 | G 3/8 | G 1/2 | G 1/2 |
| k | [mm] | 13 | 17 | 21 | 25 | 31 |
| l | [mm] | 55 | 70 | 87 | 101 | 122 |
| m (clamping edge) | [mm] | 18 | 23 | 28 | 33 | 40 |
| n | [mm] | 53 | 68 | 85 | 99 | 120 |
| o | [mm] | 20 | 26 | 33 | 40 | 48 |
| p | [mm] | 13 | 18 | 22 | 26 | 33 |
| q | [mm] | 34 | 42 | 52 | 63 | 80 |
| r | [mm] | 65 | 80 | 95 | 110 | 135 |
| s | [mm] | 70 | 86 | 103 | 120 | 147 |
| t | [mm] | 104 | 130 | 156 | 194 | 240 |
| u | [mm] | 30 | 38 | 45 | 60 | 75 |
| v | [mm] | 50 | 61 | 72 | 85 | 100 |
| w | [mm] | 38 | 47 | 59 | 71 | 88 |
| x | [mm] | 5.5 | 8 | 8 | 10 | 10 |
| y | [mm] | 70 | 86 | 103 | 120 | 147 |
| z | [mm] | 21 | 24 | 29 | 32 | 38 |
| (Manual emergency operation) SW1 | [mm] | 12 | 14 | 19 | 24 | 32 |
| (Manual emergency operation) SW2 | [mm] | 6 | 8 | 10 | 12 | 14 |
| Draw-off thread AG1 | | M8 | M10 | M12 | M12 | M16 |
| Weight | [kg] | 7.4 | 14.7 | 25 | 47 | 85 |

with pipe connection

Part no. 2154160 2155160 2156160 2157160 2158160

with manifold-mounting connection

Part no. 2154200 2155200 2156200 2157200 2158200

Further sizes and special versions are available on request.

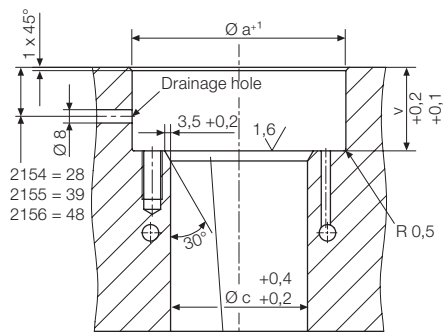
Swing sink clamp for clamping edge m = 50 mm

| | | | | |
|--|--------------------|------------------|------------------|------------------|
| m | [mm] | 50 | 50 | 50 |
| h | [mm] | 74 | 81 | 87 |
| b | [mm] | 190 | 224 | 264 |
| n | [mm] | 85 | 95 | 107 |
| l | [mm] | 87 | 97 | 109 |
| Oil volume clamping | [cm ³] | 222 | 420 | 764 |
| Oil volume unclamping | [cm ³] | 174 | 342 | 601 |
| with pipe connection | Part no. | 821548059 | 821558047 | 821568023 |
| with manifold-mounting connection | Part no. | 821548082 | 821558050 | 821568027 |

Important note!

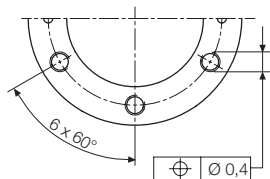
Access to one of the two manual emergency operations SW1 or SW2 is essential.

**Mounting hole
for manifold-mounting or pipe connection**



Option:
O-ring for sealing the housing
is not delivered with the element

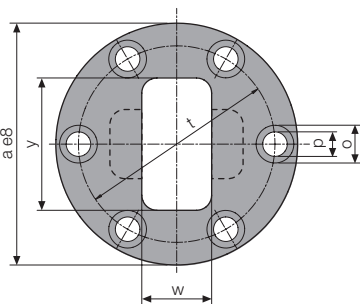
- 2154 = 82,15 x 3,53
- 2155 = 104,37 x 3,53
- 2156 = 126,59 x 3,53



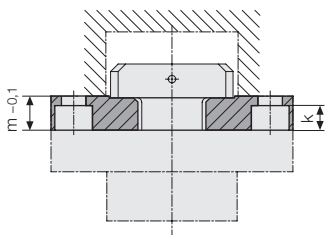
Manifold-mounting connection requires a plain and neat surface. The drainage hole may be drilled in any position provided that spray and separating agent can drain off freely.

Accessory

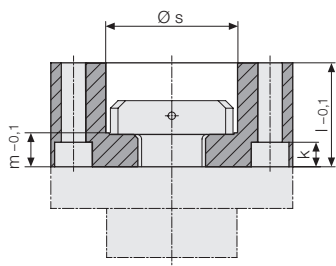
**Flange as a clamping point
for installation in press dies**



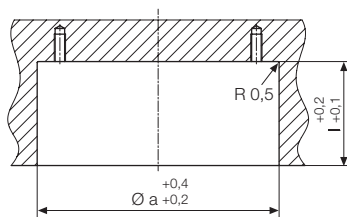
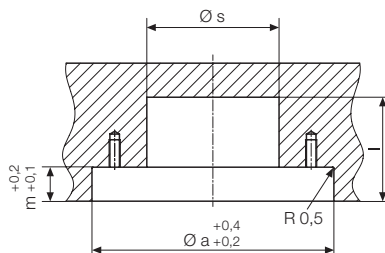
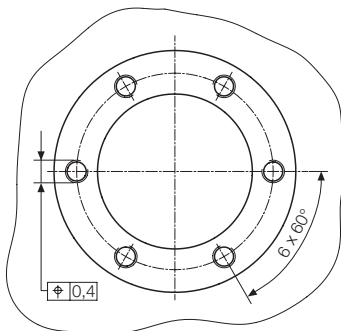
Flange - low



Flange - high



Mounting hole



| Clamp type | 2154 160 | 2155 160 | 2156 160 |
|------------|-----------|----------|----------|
| | 2154 200 | 2155 200 | 2156 200 |
| a | [mm] 128 | 160 | 192 |
| k | [mm] 13 | 17 | 21 |
| l | [mm] 55 | 70 | 87 |
| m | [mm] 18 | 23 | 28 |
| o | [mm] 20 | 26 | 33 |
| p | [mm] 13 | 18 | 22 |
| s | [mm] 70+3 | 86+4 | 103+5 |
| t | [mm] 104 | 130 | 156 |
| w | [mm] 38 | 47 | 59 |
| y | [mm] 70 | 86 | 103 |

Flange - low

| | | | |
|----------|---------|---------|---------|
| Part no. | 5700016 | 5700017 | 5700018 |
|----------|---------|---------|---------|

Flange - high

| | | | |
|----------|---------|---------|---------|
| Part no. | 5700019 | 5700020 | 5700021 |
|----------|---------|---------|---------|

| Clamp type | 2157 160 | 2158 160 |
|------------|-----------|----------|
| | 2157 200 | 2158 200 |
| a | [mm] 238 | 292 |
| k | [mm] 24.5 | 31 |
| l | [mm] 101 | 122 |
| m | [mm] 33 | 40 |
| o | [mm] 40 | 48 |
| p | [mm] 26 | 33 |
| s | [mm] 130 | 160 |
| t | [mm] 194 | 240 |
| w | [mm] 71 | 88 |
| y | [mm] 120 | 147 |

Flange - low

| | | |
|----------|---------|---------|
| Part no. | 5700039 | 5700041 |
|----------|---------|---------|

Flange - high

| | | |
|----------|---------|---------|
| Part no. | 5700040 | 5700042 |
|----------|---------|---------|

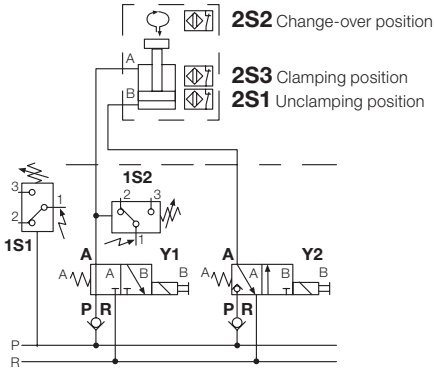
Functional description

Functional diagram

Functional description

The piston of the double-acting swing sink clamp is guided by a guide pin in such a manner that during part of the stroke a 45° rotation is carried out just before reaching and just after leaving the piston upper end position. The rotation is always anti-clockwise, no matter whether the piston extends or retracts.

Hydraulic circuit diagram



1. Unclamping position

The piston is completely retracted. This permits an easy die change, as no parts project over the bed level. Proximity switch 2 S1 monitors this position.

2. Change-over position for clamping

Valves Y1 and Y2 are energised, and pressure is applied to piston side B. The tie rod passes through the slot of the clamping point and is then rotated by 45°. Proximity switch 2 S2 monitors this position.

3. Clamping position

Valves Y1 and Y2 are de-energised, and pressure is applied to piston rod side A. The tie rod makes a further 45° rotation and is now transversely above the clamping point. The die is clamped. Proximity switch 2 S3 monitors this position. After obtaining the clamping pressure, the power unit is switched off by the pressure switch 1 S2.

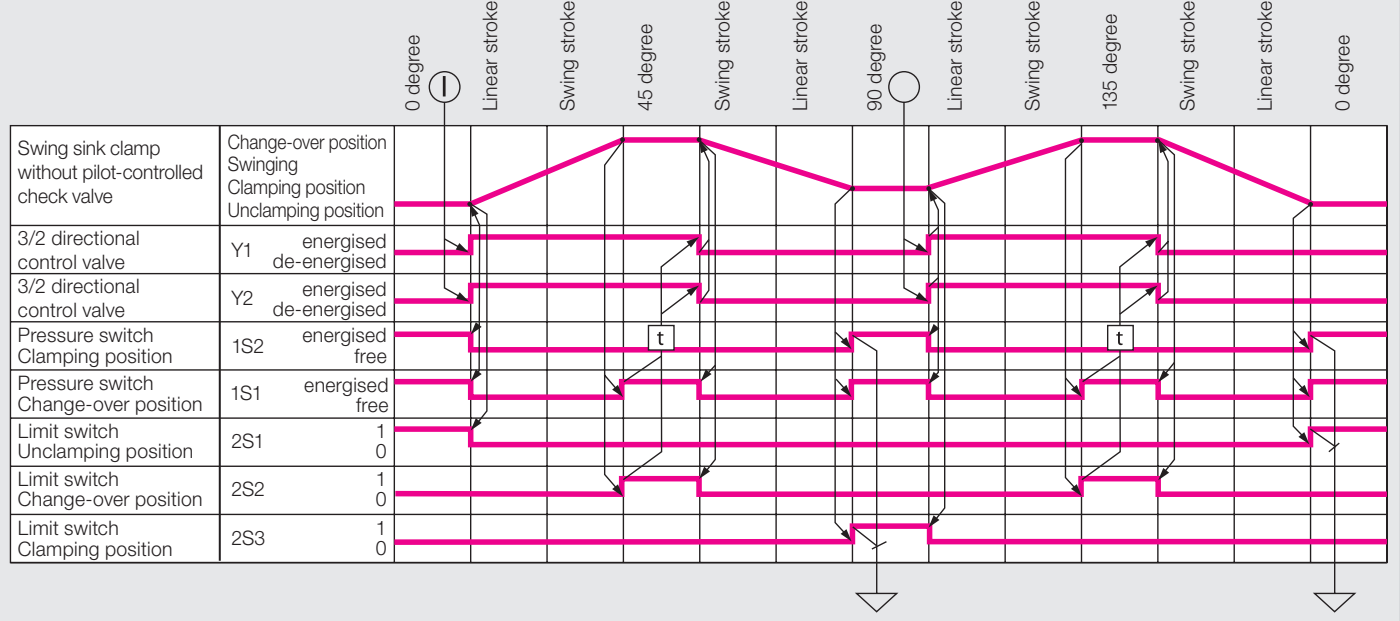
4. Change-over position for unclamping

Valves Y1 and Y2 are energised, and pressure is applied to the piston side B. The tie rod is extended and then again rotated by 45°. Proximity switch 2 S2 monitors this position.

5. Unclamping position

Valves Y1 and Y2 are de-energised, and pressure is applied to the piston rod side A. The tie rod makes a further 45° rotation and passes through the slot of the clamping point as far as the end position. Proximity switch 2 S1 monitors this position. The die is unclamped.

Functional diagram



Hydraulic installation

Read the operating manual before starting up. Adjust the flow rate of the power unit so that clamping and unclamping cycles between 10 and 30 seconds are obtained. In order to prevent the swing mechanism from premature wear, the dynamic pressure at port B should not exceed 50 bar while the tie rods retract through the slot. Swing sink clamps which are grouped together

er should be connected to distribution boards, in order to avoid series connection. Use pipes with larger diameter for connection to the power unit.

If in doubt, please send the installation plan to be reviewed.

Provide a pressure gauge connection in every hydraulic circuit for adjustment and to check operating data.

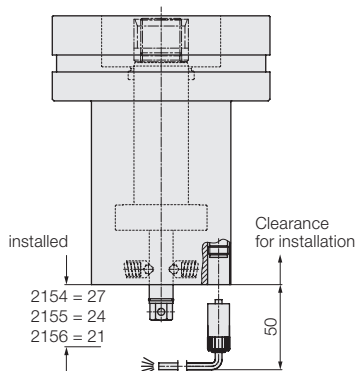
Other parameters and recommendations for hydraulic installation of die clamping systems are given in chapter no. 1 "General information".

Important note!

The full stroke of the piston must be realised, otherwise the swing mechanism may be damaged.

Electrical installation

Connection of the monitoring system for clamping and unclamping position

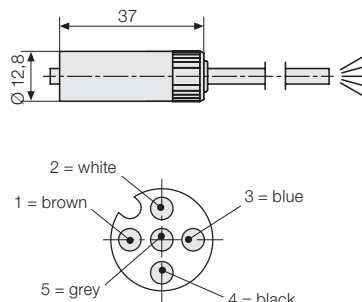


The three proximity switches are connected to the base of the swing sink clamp through a connecting cable with a screw coupling [IP 67]. (The connecting cable is not included in the delivery).

Further installation may be carried out using a distribution board with an LED display.

Accessories

5-pole connecting cable with screw coupling



Cable length 5 m **Part no. 5700013**
 Cable length 10 m **Part no. 5700014**

Accessories

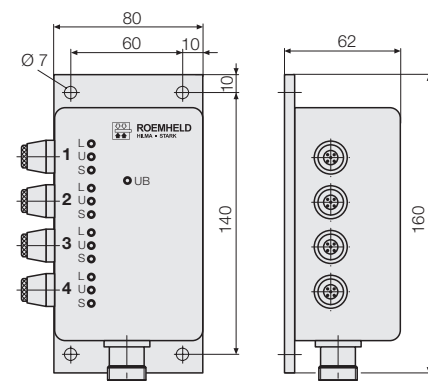
Distribution board with LED display for the connection of 4 clamps

Display of the unclamping, change-over and clamping position of each clamping element via LED display.

Delivery

- 1 distribution board
- 4 5-pole coupling plug
- 1 16-pole coupling plug

Part no. 5700015



Pin assignment of output plug:

| | |
|------------|---------------|
| Pin 1 = L+ | Pin 9 = 3L |
| Pin 2 = L- | Pin 10 = 3U |
| Pin 3 = 1L | Pin 11 = 3S |
| Pin 4 = 1U | Pin 12 = 4L |
| Pin 5 = 1S | Pin 13 = 4U |
| Pin 6 = 2L | Pin 14 = 4S |
| Pin 7 = 2U | Pin 15 = free |
| Pin 8 = 2S | Pin 16 = free |

L = unclamping position
U = change-over position
S = clamping position

Pin assignment for three-wire proximity switches

| | |
|------------------|------------------------------|
| Supply voltage | 10 – 30 V DC |
| Constant current | ≤ 100 mA |
| Type | inductive, break contact pnp |

