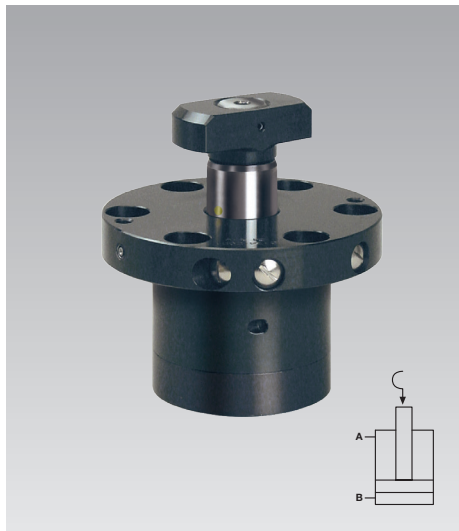




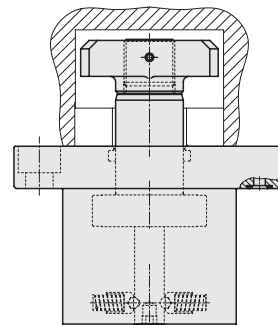
## Swing Clamps

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 ( $\pm 1.5$  mm)
- No colliding edges when inserting the dies
- Optimum utilisation of the ram area
- Clamping at difficultly accessible points



### Application

Swing 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

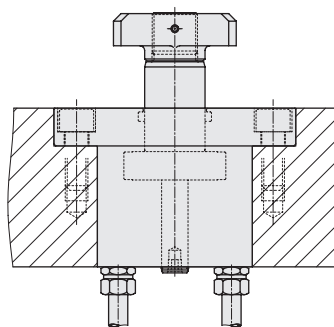
### Description

Swing clamp, double acting, with 90° swing angle. Monitoring of the clamping and unclamping position 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. The hydraulic system is protected by a wiper ring.

### Connecting possibilities

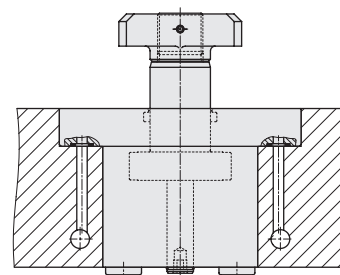
Two alternatives are offered for connecting the swing clamps.

#### Pipe connection



Pipes are recommended in applications where fittings are easily accessible and where pipes do not impede installation and dismantling of the swing 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 clamp. Easy installation, ease of servicing.

### Application example



Use of swing clamps in the press ram. Shown is the die change position, i.e. the ram is in the upper position and the swing clamps are extended.

### Accessories

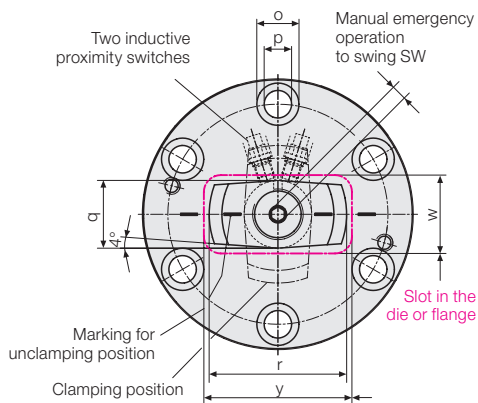
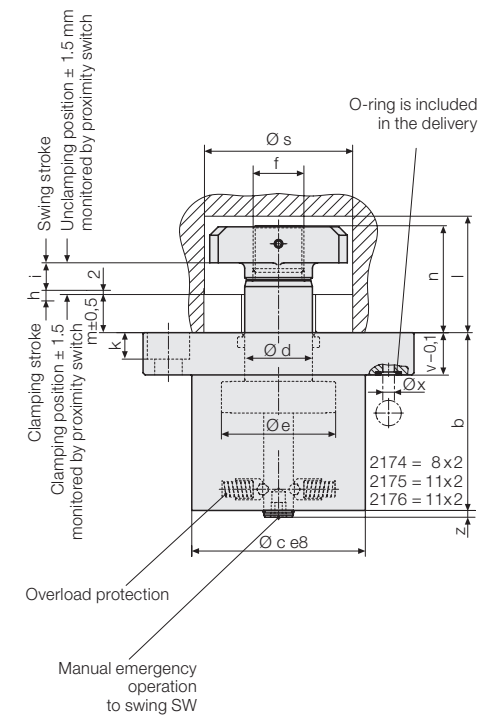
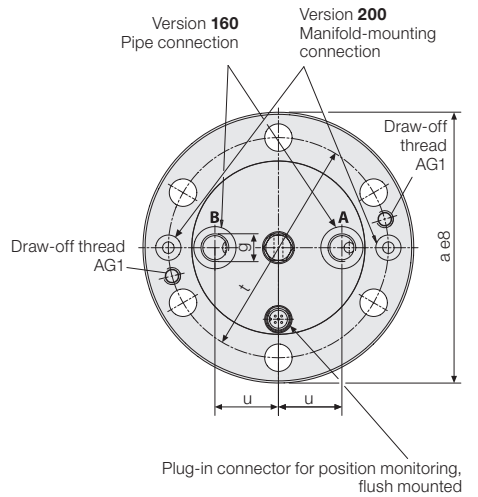
**Flange as a clamping point**  
 for installation in press dies  
 see page 3

**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]	13	18	24	28	35
Clamping and sink stroke h	[mm]	5	6	6	6	6
Oil volume clamping	[cm <sup>3</sup> ]	22	52	107	192	381
Oil volume unclamping	[cm <sup>3</sup> ]	34	77	158	286	570
Max. flow rate	[cm <sup>3</sup> /s]	10	16	25	75	150
a	[mm]	128	160	192	238	292
b	[mm]	84	104	122	165	182
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	[mm]	18	23	28	33	40
n	[mm]	51	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]	20	28	35	42	52
w	[mm]	38	47	59	71	88
x	[mm]	5.5	8	8	10	10
y	[mm]	70	86	103	120	147
z	[mm]	4	5	6	14	14
(Manual emergency operation) SW2	[mm]	6	8	10	24	32
Draw-off thread AG1		M8	M10	M12	M12	M16
Weight	[kg]	4.2	8.6	15	34	60

with pipe connection

Part no. 2174160 2175160 2176160 2177160 2178160

with manifold-mounting connection

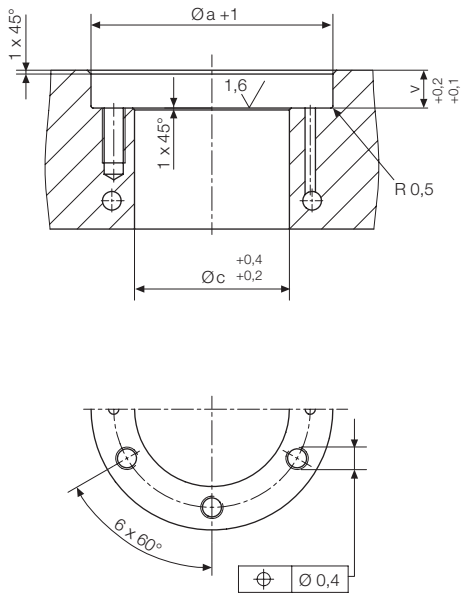
Part no. 2174200 2175200 2176200 2177200 2178200

Further sizes and special versions are available on request

## Important note!

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

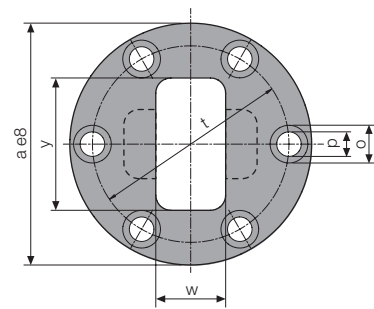
**Mounting hole  
for manifold-mounting or pipe connection**



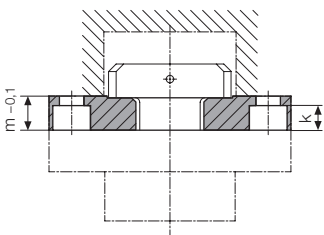
Manifold-mounting connection requires a plain and neat surface.

**Accessory**

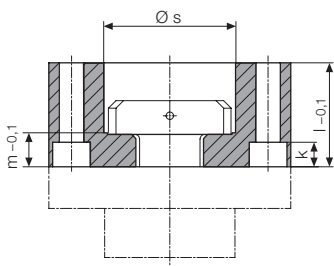
**Flange as a clamping point  
for installation in press dies**



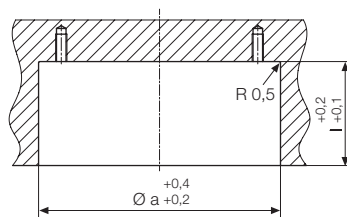
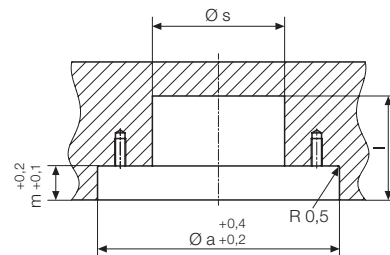
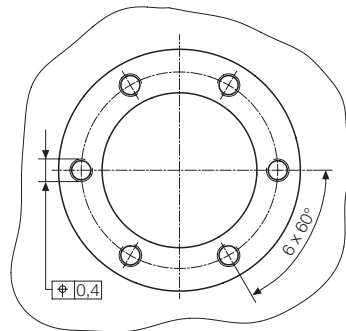
**Flange - low**



**Flange - high**



**Mounting hole**



Clamp type	2174 160	2175 160	2176 160
	2174 200	2175 200	2176 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
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**Flange - high**

Part no.	5700019	5700020	5700021
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Clamp type	2177 160	2178 160
	2177 200	2178 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
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**Flange - high**

Part no.	5700040	5700042
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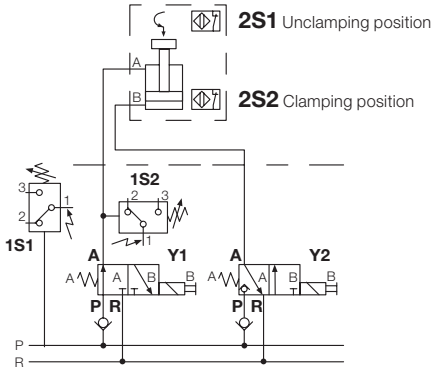
# Functional description

## Functional diagram

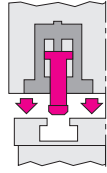
### Functional description

Double acting swing clamp, with 90° swing angle. Monitoring of the clamping and unclamping position 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. The hydraulic system is protected by a wiper ring.

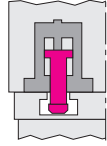
### Hydraulic circuit diagram



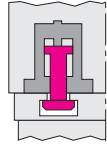
### Clamping



1. Push and position the die into the press with the swing clamps in the off-position.



2. Lower the press ram onto the upper part of the die. The tie rods of the swing clamps will pass through the clamping slots of the upper die.

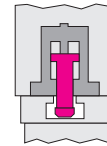


3. The swing clamps are operated by means of a power unit. The tie rod rotates by 90° and is then in a transverse position to the clamping point.

The upper die is hydraulically clamped. Once the clamping pressure has been reached the power unit will be switched off by the pressure switch 1S2.

In the case of a pressure drop, the power unit is switched on by the pressure switch and builds up to the required clamping pressure.

### Unclamping



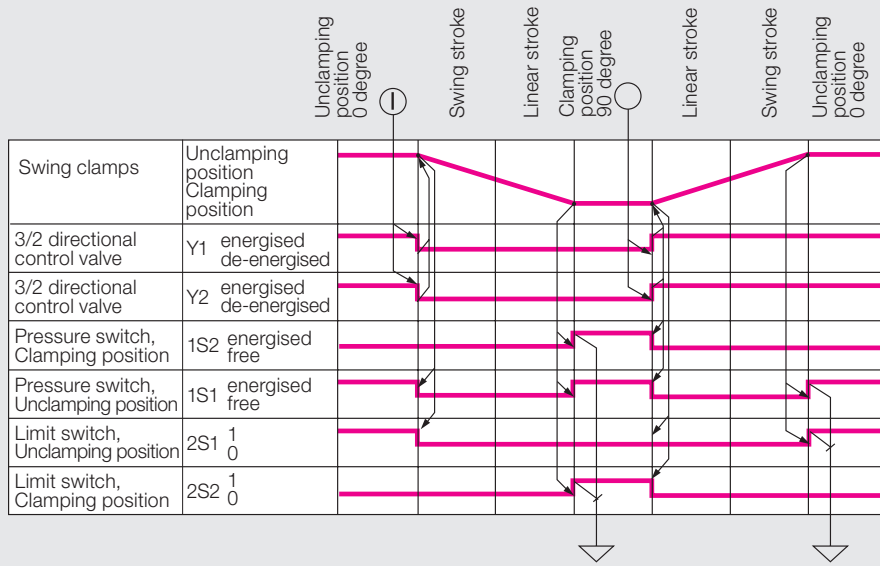
1. Move the dies together and return the swing clamps into the unclamping position by means of energising valves Y1 and Y2.

The tie rod rotates by 90° and can then pass through the clamping slot of the upper die.

2. Move the press ram upwards and take the die out.

**The clamping and unclamping positions are monitored by inductive proximity switches.**

### 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 clamps which are grouped together

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

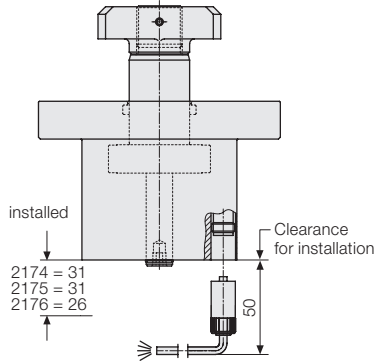
If in doubt, please send the installation plan to be reviewed.

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".

## Electrical installation

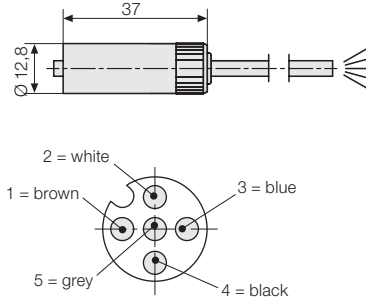
### Connection of the monitoring system for clamping and unclamping position



Both proximity switches are connected to the base of the swing clamp through a connecting cable with screw coupling [IP 67]. Please order the connecting cable separately. 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

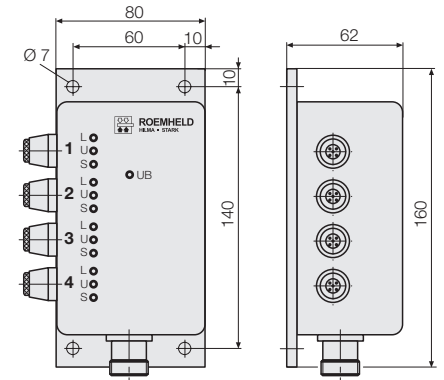
### Distribution board with LED display for the connection of 4 clamps

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

## Delivery

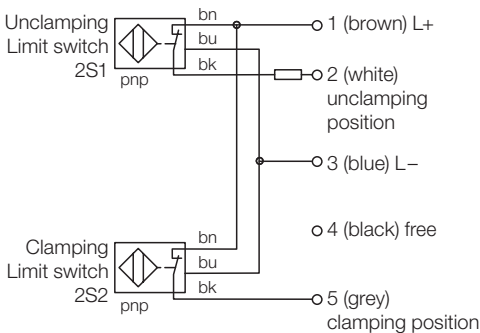
- 1 distribution board
- 4 5-pole coupling plug
- 1 16-pole coupling plug

### Part no. 5700015



## Pin assignment for three-wire proximity switches

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



## Pin assignment of output plug:

- Pin 1 = L+
- Pin 2 = L-
- Pin 3 = 1L
- Pin 4 = do not use
- Pin 5 = 1S
- Pin 6 = 2L
- Pin 7 = do not use
- Pin 8 = 2S
- Pin 9 = 3L
- Pin 10 = do not use
- Pin 11 = 3S
- Pin 12 = 4L
- Pin 13 = do not use
- Pin 14 = 4S
- Pin 15 = free
- Pin 16 = free

**L = unclamping position**  
**U = not assigned**  
**S = clamping position**