

Applications:

- ▶ integrated in press rams
- ▶ in machine tools and equipment
- ▶ when the available space is limited
- ▶ when temperatures may reach 70° C

Design:

Double-acting swing clamp with 90° swing angle. Unclamping and clamping are monitored by inductive proximity switches. The swing mechanism is protected by a spring-loaded overload protection and is equipped with emergency hand operation. The tie rod, piston and swing mechanism are hardened. The hydraulic system is protected by a wiper ring.

Special features:

- ▶ Ideal power transmission
- ▶ Compact design
- ▶ Clamping force of between 60 and 164 kN
- ▶ Position monitoring, emergency hand operation and overload protection combine to ensure high functional safety
- ▶ Compensates for large clamping edge tolerances (± 1.5 mm)
- ▶ Optimum use of ram surface
- ▶ Die clamping in barely accessible positions

For power units

please see product group 7

For accessories

please see product group 11



The swing clamps are fastened in the press ram.

The ram is in the upper position and the swing clamps are extended (die change position).

Swing clamping element, double acting



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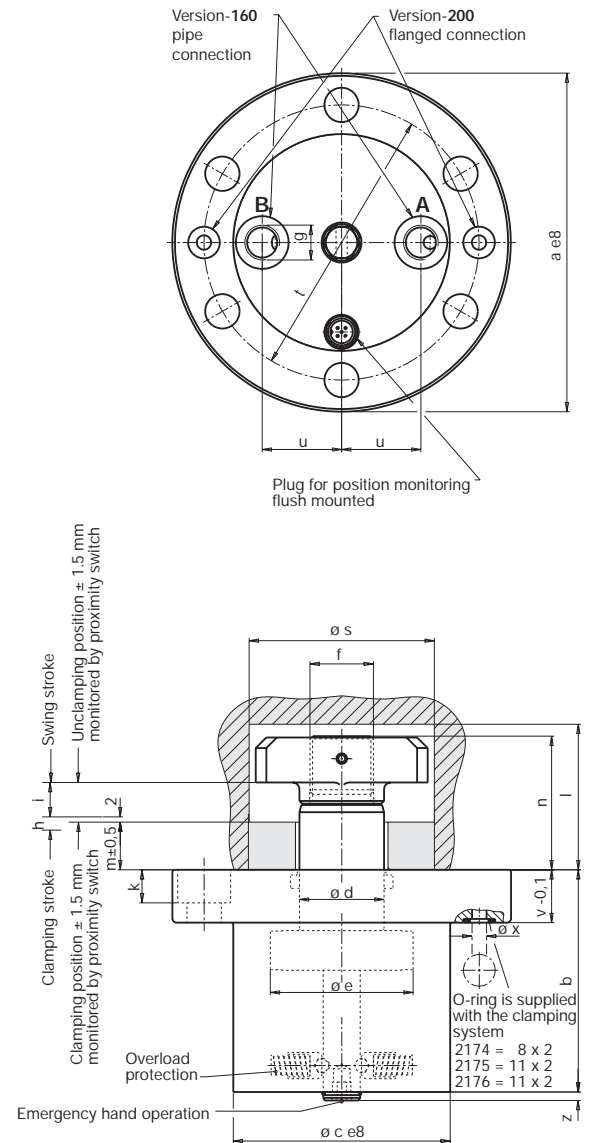
Clamping force at 400 bar (kN)	60	104	164
Clamping force at 100 bar (kN)	15	26	41
Piston-Ø e (mm)	54	70	88
Piston rod-Ø d (mm)	32	40	50
Swing stroke i (mm)	13	18	24
Clamping stroke h (mm)	5	6	6
Oil consumption clamping (cm ³)	22	52	107
Oil consumption unclamping (cm ³)	34	77	158
Max. volume flow (cm ³ /s)	10	16	25
a (mm)	128	160	192
b (mm)	84	104	122
c (mm)	82	104	126
f (mm)	M24x1,5	M30x1,5	M36x1,5
g (mm)	G 1/4	G 3/8	G 3/8
k (mm)	13	17	21
l (mm)	55	70	87
m (mm)	18	23	28
n (mm)	51	68	85
o (mm)	20	26	33
p (mm)	13	18	22
q (mm)	32	40	50
r (mm)	65	80	95
s (mm)	70	86	103
t (mm)	104	130	156
u (mm)	30	38	45
v (mm)	20	28	35
w (mm)	37	46	58
x (mm)	5,5	8	8
y (mm)	70	86	103
z (mm)	4	5	6
Emergency hand operation SW(mm)	6	8	10
Weight (kg)	4,2	8,6	15
Part no.			
with pipe connection	2174-160	2175-160	2176-160
with flanged connection	2174-200	2175-200	2176-200

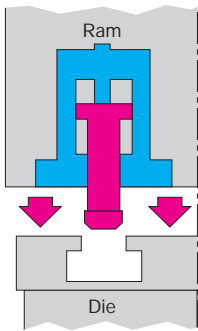
Max. operating pressure 400 bar

Other sizes and special versions are available on request.

Please note!

Access to one of the two emergency hand controls is essential.

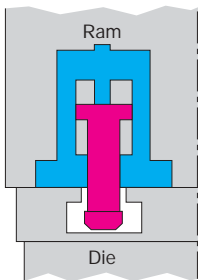




Function

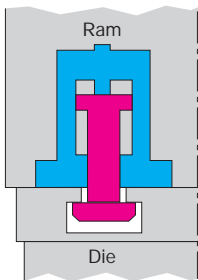
Clamping

1. Push the die into the press with the swing clamping elements in the rest position.
2. Lower the press ram onto the upper part of the die. The tie rods of the swing clamping elements will pass through the clamping slots of the upper die.
3. The swing clamping elements 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 through pressure switch 1S2. In the event of a fall in pressure, the power unit is switched on by means of the pressure switch and builds up to the required clamping pressure.

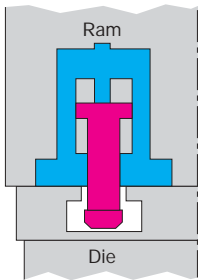


Unclamping

1. Move the dies together and return the swing clamping elements 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 slots of the upper die.
2. Move the press ram upwards and take the die out.



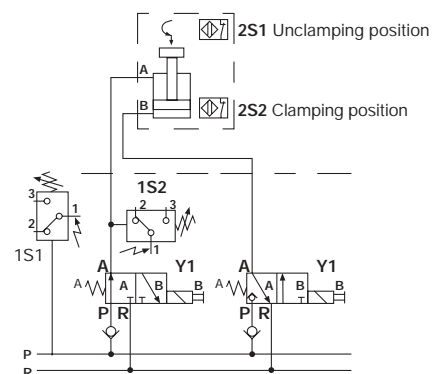
The clamping and unclamping positions are monitored by inductive proximity switches.



Functional diagram

		Unclamping position 0 - degrees	Swing stroke	Linear stroke	clamping position 90 - degrees	Linear stroke	Swing stroke	Unclamping position 0 - degrees
Swing clamping elements	unclamping position	1						1
	clamping position				1			
3/2 way valve	Y1 energised		1				1	
	idle	1						1
3/2 way valve	Y2 energised		1				1	
	idle	1						1
Pressure switch	1S2 energised				1			
clamping position	free	1					1	
Pressure switch	1S1 energised						1	
unclamping position	free	1						1
Limit switch,	2S1	1						1
unclamping position	0							
Limit switch,	2S2				1			
clamping position	0							

Hydraulic schematics



Swing clamping element double-acting

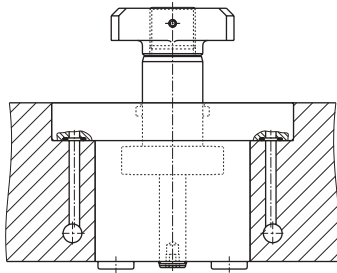


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Recommended installation

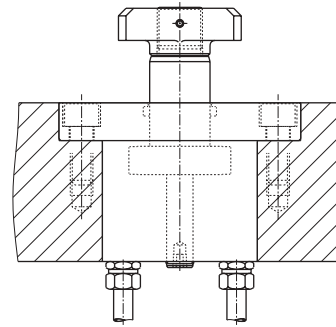
In order to ensure ease of servicing, two alternatives are offered for connecting the swing clamps.

Flanged connection



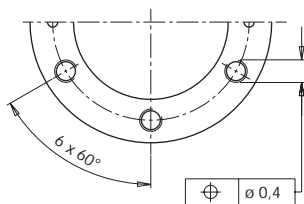
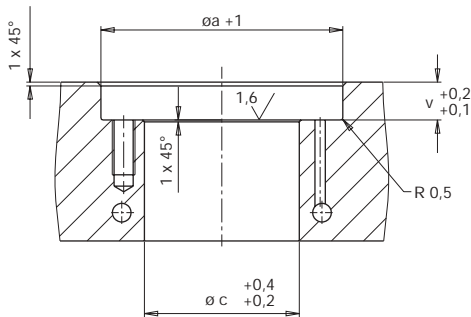
Hydraulic oil is fed through the drilled holes in the bed and in the ram. There are no exposed conduits or screw fittings. O-rings supplied with the clamping element provide for tight fitting. Easy installation, ease of servicing.

Pipe connection



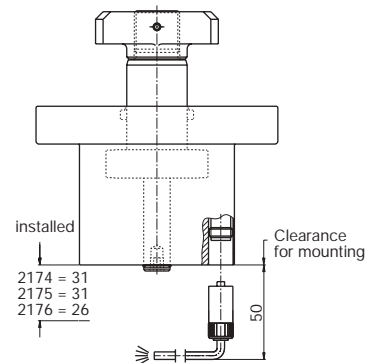
Pipes are recommended in applications where screw fittings are easily accessible and where pipes do not impede installation and dismantling of the swing clamps.

Drilled hole for flange or pipe connection



Flanged connection requires a plain and neat surface.

Connection of the monitoring system for clamping and unclamping position



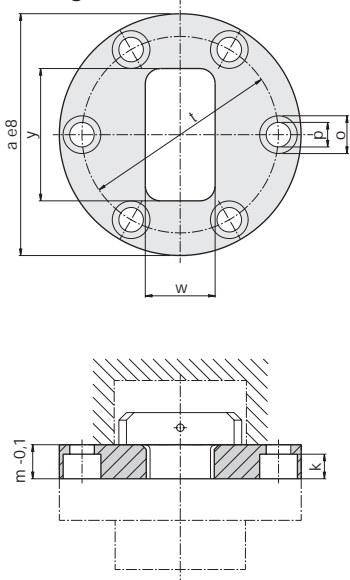
Both proximity switches are connected to the base of the swing clamp through a connecting lead with a screw coupling [IP 67]. The connecting lead must be ordered separately. Further installation may be carried out using a distribution block with an LED display, see page 15



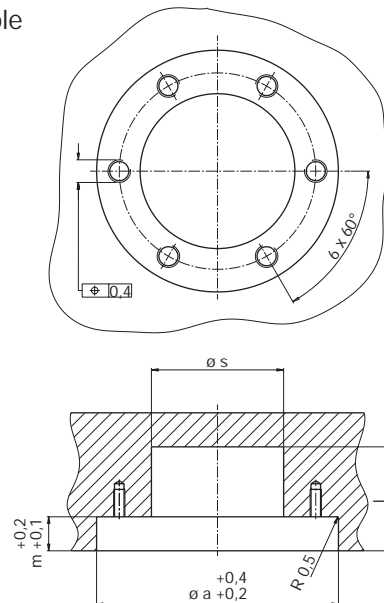
Accessories

Flange as a clamping point for installation in press dies

Flange

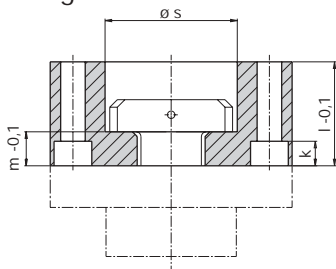


Location hole

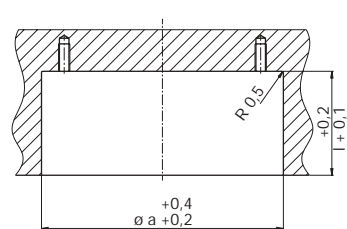


Part no.	for clamping element type	Dimensions in mm									
		a	k	l	m	o	p	s	t	w	y
5700-016	2174-160	128	13	55	18	20	13	70	104	37	70
	2174-200										
5700-017	2175-160	160	17	70	23	26	18	86	130	46	86
	2175-200										
5700-018	2176-160	192	21	87	28	33	22	103	156	58	103
	2176-200										

Flange



Location hole



Part no.	for clamping element type	Dimensions in mm									
		a	k	l	m	o	p	s	t	w	y
5700-019	2174-160	128	13	55	18	20	13	70	104	37	70
	2174-200										
5700-020	2175-160	160	17	70	23	26	18	86	130	46	86
	2175-200										
5700-021	2176-160	192	21	87	28	33	22	103	156	58	103
	2176-200										

For more accessories, please see product group 11

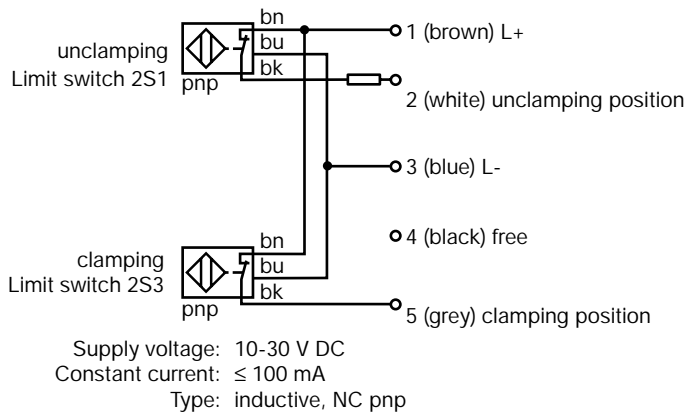
Swing clamping element double-acting



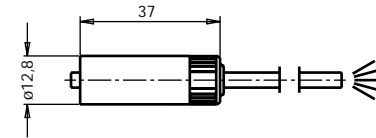
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Electrical installation

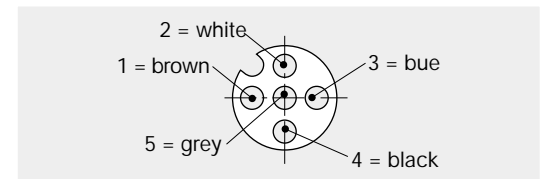
Pin assignment for three-wire proximity switches



5-pole connecting lead with screw coupling



Cable length 5 m **Part no. 5700-013**
 Cable length 10 m **Part no. 5700-014**



Distribution block with LED display for connecting 4 clamping elements

Easy installation!

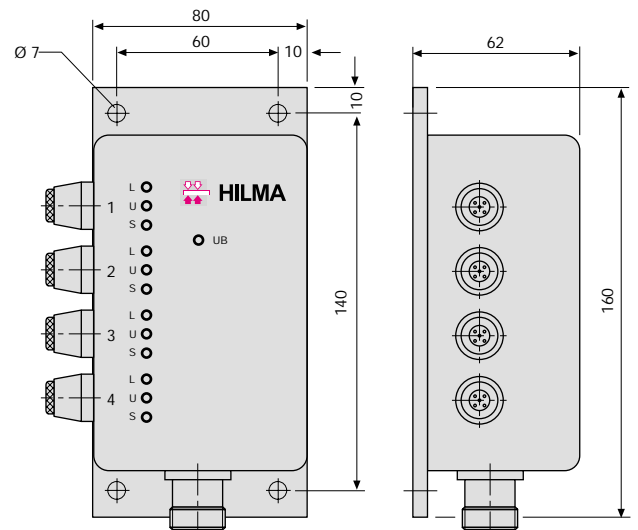
LED display of the unclamping, change-over and clamping position of each clamping element.

Scope of delivery: 1 distribution block
 4 coupler plugs, 5 poles
 1 coupler plug, 16 poles

Wiring of output plug:

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

L = Unclamping position
U = not assigned
S = Clamping position



Part no. 5700-015

Hydraulic installation

Read the operating instructions before commissioning the system.

Adjust the displacement 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 blocks, 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 operational data.

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

Please note:

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