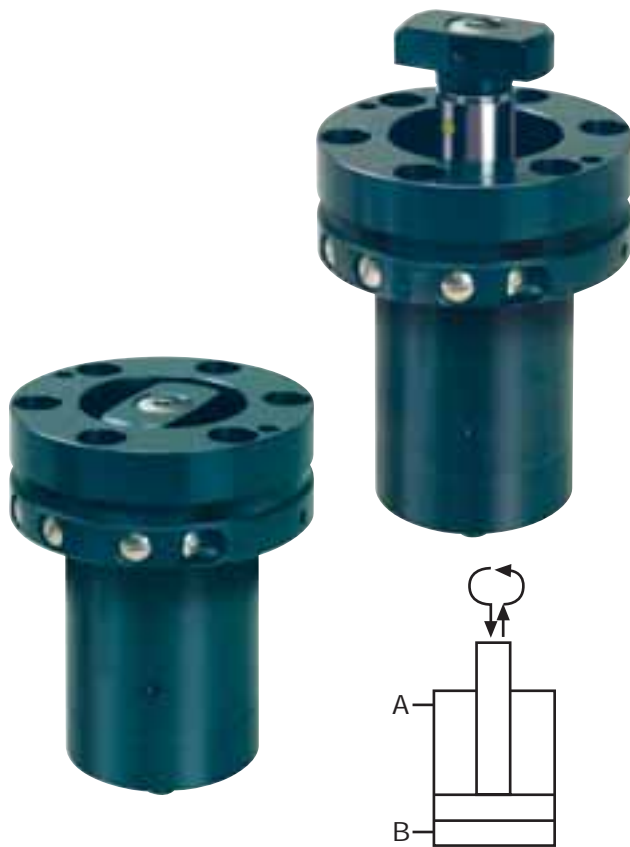


# Swing sink clamping element double-acting



# HILMA



## For power units

please see product group 7

## For accessories

please see product group 11

## Applications:

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

## Design:

Double-acting swing sink clamp with 90° swing angle. The piston is guided by a guide pin in such a manner that during part of the stroke a 45° rotation is carried out. Unclamping, change-over and clamping are monitored by inductive proximity switches. The swing mechanism is protected by a spring-loaded overload protection and equipped with emergency hand operation. The tie rod, piston and swing mechanism are hardened.

## 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 ( $\pm 1.5$  mm)
- No colliding edges, smooth die positioning
- Optimum use of ram and bed surfaces
- Die clamping in barely accessible positions

Swing sink clamps fastened in a double column press. The tie rod is extended (swing position). Easy die positioning is ensured by hydraulic roller blocs in T-slots and lateral stops





# HILMA

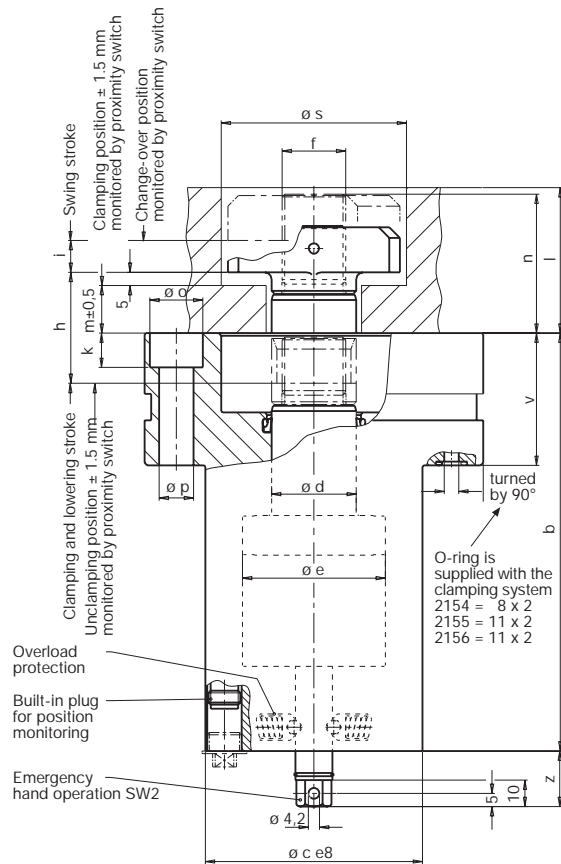
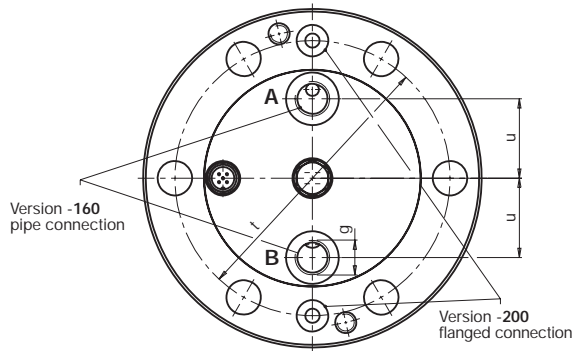


## Swing sink clamping element double-acting

Max. operating pressure 400 bar

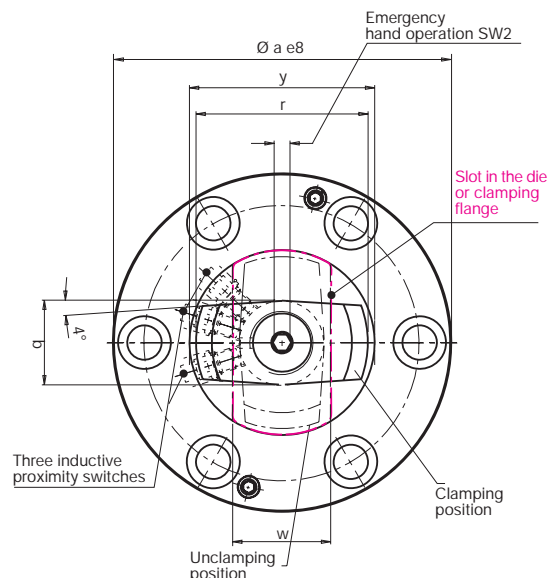
Other sizes and special versions are available on request.

| 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)                           | 12       | 15       | 21       |
| Clamping+lowering stroke h (mm)               | 42       | 54       | 65       |
| Oil consumption clamping (cm <sup>3</sup> )   | 150      | 318      | 630      |
| Oil consumption unclamping (cm <sup>3</sup> ) | 120      | 256      | 512      |
| Max. volume flow (cm <sup>3</sup> /s)         | 15       | 32       | 63       |
| a (mm)  | 128      | 160      | 192      |
| b (mm)  | 158      | 197      | 242      |
| 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 (clamping edge) (mm)                        | 18       | 23       | 28       |
| n (mm)  | 53       | 68       | 85       |
| o (mm)  | 20       | 26       | 33       |
| p (mm)  | 13       | 18       | 22       |
| q (mm)  | 34       | 42       | 52       |
| r (mm)  | 65       | 80       | 95       |
| s (mm)  | 70       | 86       | 103      |
| t (mm)  | 104      | 130      | 156      |
| u (mm)  | 30       | 38       | 45       |
| v (mm)  | 50       | 61       | 72       |
| w (mm)  | 38       | 47       | 59       |
| x (mm)  | 5,5      | 8        | 8        |
| y (mm)  | 70       | 86       | 103      |
| z (mm)  | 21       | 24       | 29       |
| (Emergency hand operation) SW1 (mm)           | 12       | 14       | 19       |
| (Emergency hand operation) SW2 (mm)           | 6        | 8        | 10       |
| Weight (kg)                                   | 7,4      | 14,7     | 25       |
| <b>Part no.</b>                               |          |          |          |
| with pipe connection                          | 2154-160 | 2155-160 | 2156-160 |
| with flanged connection                       | 2154-200 | 2155-200 | 2156-200 |



### Swing sink clamping element 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 consumption clamping (cm <sup>3</sup> )   | 222         | 420         | 764         |
| Oil consumption unclamping (cm <sup>3</sup> ) | 174         | 342         | 601         |
| <b>Part no.</b>                               |             |             |             |
| with pipe connection                          | 8.2154.8059 | 8.2155.8047 | 8.2156.8023 |
| with flanged connection                       | 8.2154.8082 | 8.2155.8050 | 8.2156.8027 |



#### Please note!

Access to one of the two emergency hand controls SW1 or SW 2 is essential.

# 4.2150

02/2004

**Hilma-Römheld GmbH**

Schützenstraße 74 · D-57271 Hilchenbach

Phone +49 (0) 2733 / 281-0 · Fax +49 (0) 2733 / 281-113 · www.hilma.de

Subject to technical modification

# Swing sink clamping element, double-acting



**HILMA**

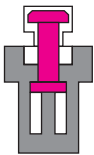
## Function:

The piston 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 rest position. The rotation is always anti-clockwise, no matter whether the piston extends or retracts.



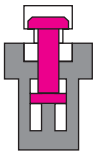
### 1. Unclamping position

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



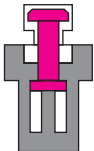
### 2. Change-over position for clamping

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 2S2 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 2S3 monitors this position. Once the clamping pressure has been reached the power unit will be switched off by pressure switch 1S2. In the event of a fall in pressure, the power unit is switched on by the pressure switch and builds up to the required clamping pressure.



### 4. Change-over position for unclamping

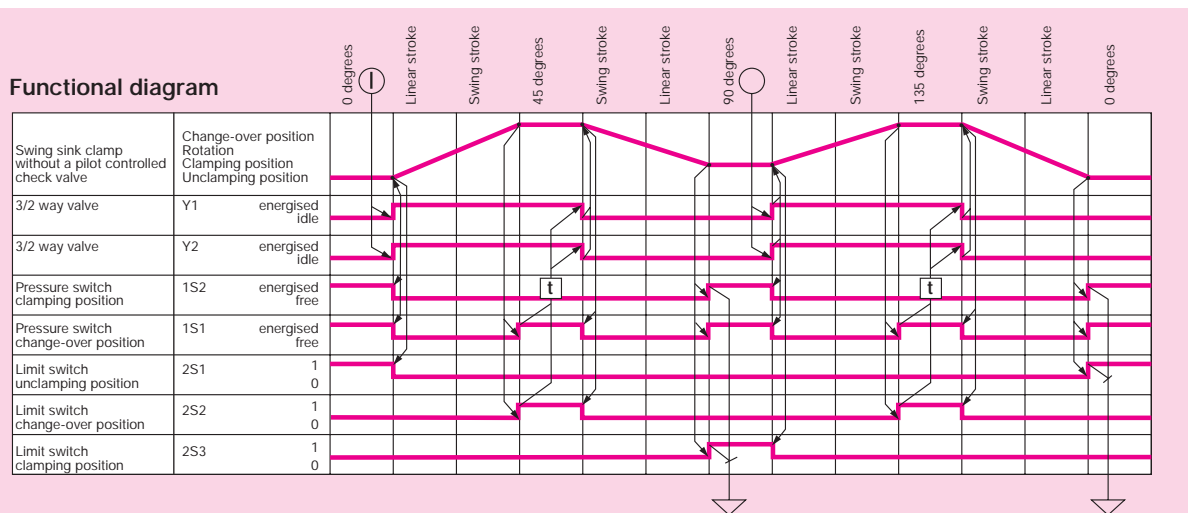
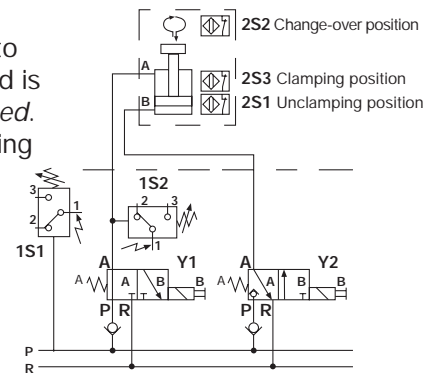
Valves Y1 and Y2 are energised, and pressure is applied to piston side B. The tie rod is extended and then again rotated by 45°. Proximity switch 2S2 monitors this position.



### 5. Unclamping 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 passes through the slot of the clamping point as far as the end position. Proximity switch 2S1 monitors this position. *The die is unclamped.*

## Hydraulic schematics

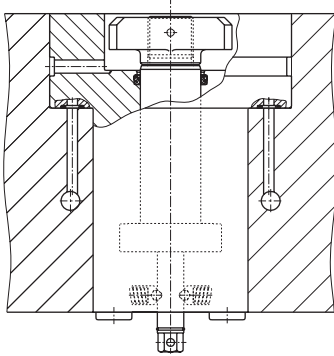




### Recommended installation

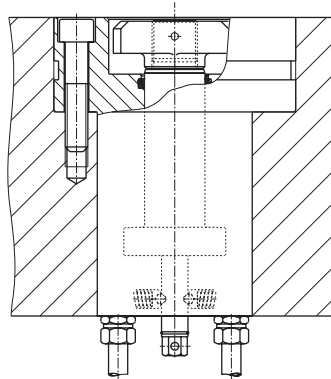
In order to ensure ease of servicing, two alternatives are offered for connecting the swing sink clamps.

#### Flanged connection



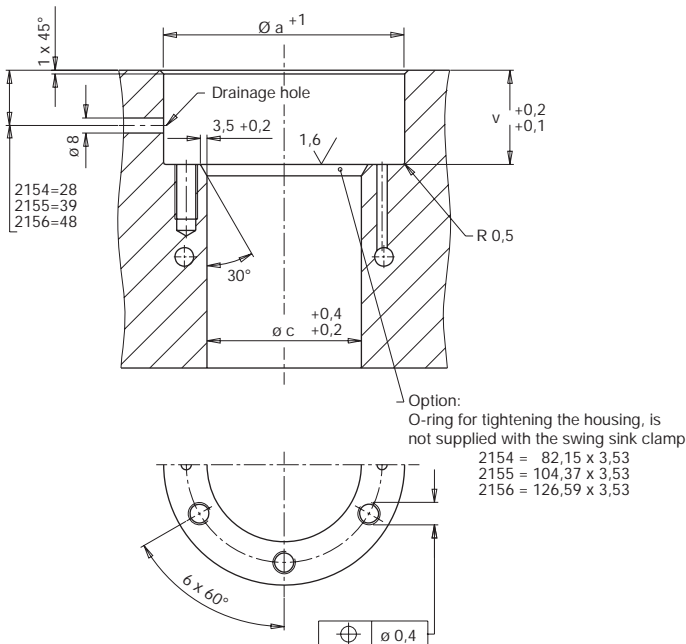
Hydraulic oil is fed through the drilled holes in the bed and in the ram. There are no exposed conduits or screw fittings. O-rings supplied with the clamping element provide for tight fitting. Easy installation, ease of servicing.

#### Pipe connection



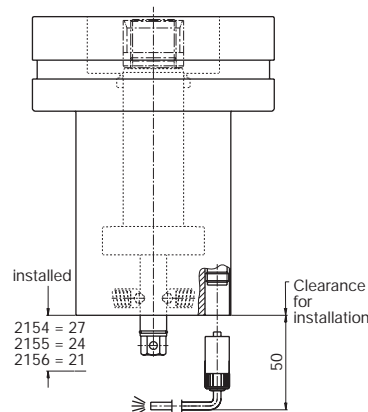
Pipes are recommended in applications where screw fittings are easily accessible and where pipes do not impede installation and dismantling of the swing sink clamps.

#### Drilled hole for flanged or pipe connection



Flanged 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.

#### 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 lead with a screw coupling [IP 67]. The connecting lead is not supplied with the swing sink clamp and it has a separate part number, see page 6. Further installation may be carried out using a distribution block with an LED display.

# Swing sink clamping element, double-acting

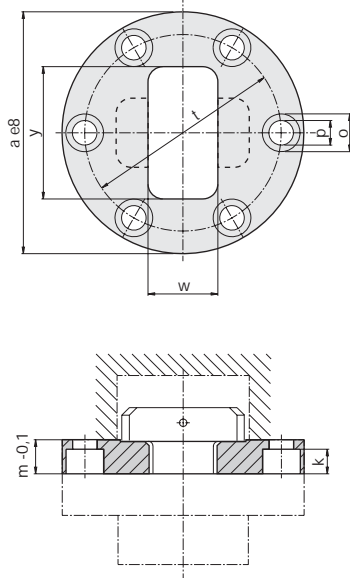


# HILMA

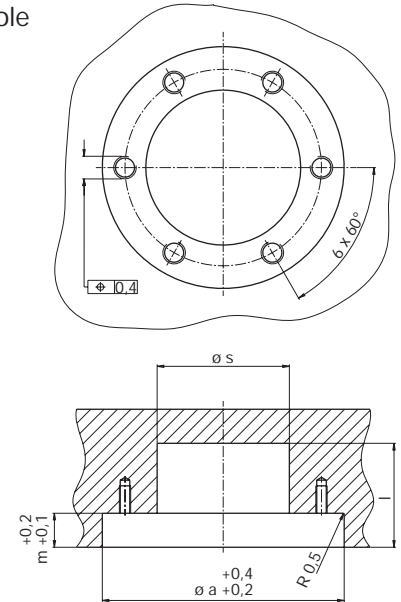
## Accessories

Flange as a clamping point for installation in press dies

Flange

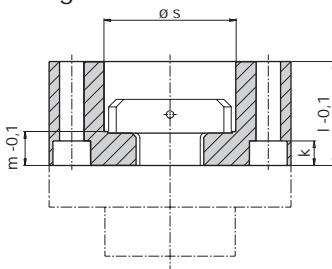


Location hole

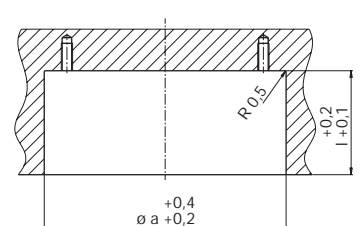


| Part no. | for clamping element type | Dimensions in mm |    |    |    |    |    |     |     |    |     |
|----------|---------------------------|------------------|----|----|----|----|----|-----|-----|----|-----|
|          |                           | a                | k  | l  | m  | o  | p  | s   | t   | w  | y   |
| 5700-016 | 2154-160                  | 128              | 13 | 55 | 18 | 20 | 13 | 70  | 104 | 38 | 70  |
|          | 2154-200                  |                  |    |    |    |    |    |     |     |    |     |
| 5700-017 | 2155-160                  | 160              | 17 | 70 | 23 | 26 | 18 | 86  | 130 | 47 | 86  |
|          | 2155-200                  |                  |    |    |    |    |    |     |     |    |     |
| 5700-018 | 2156-160                  | 192              | 21 | 87 | 28 | 33 | 22 | 103 | 156 | 59 | 103 |
|          | 2156-200                  |                  |    |    |    |    |    |     |     |    |     |

Flange



Location hole



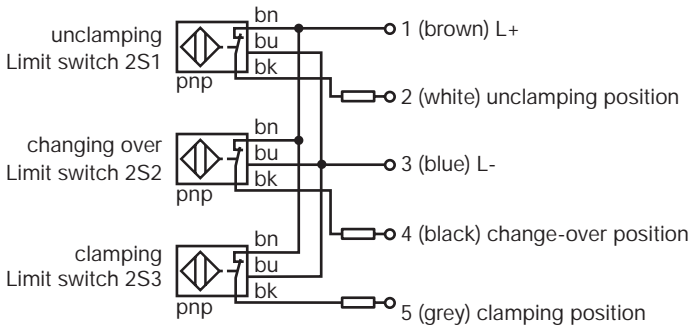
| Part no. | for clamping element type | Dimensions in mm |    |    |    |    |    |     |     |    |     |
|----------|---------------------------|------------------|----|----|----|----|----|-----|-----|----|-----|
|          |                           | a                | k  | l  | m  | o  | p  | s   | t   | w  | y   |
| 5700-019 | 2154-160                  | 128              | 13 | 55 | 18 | 20 | 13 | 70  | 104 | 38 | 70  |
|          | 2154-200                  |                  |    |    |    |    |    |     |     |    |     |
| 5700-020 | 2155-160                  | 160              | 17 | 70 | 23 | 26 | 18 | 86  | 130 | 47 | 86  |
|          | 2155-200                  |                  |    |    |    |    |    |     |     |    |     |
| 5700-021 | 2156-160                  | 192              | 21 | 87 | 28 | 33 | 22 | 103 | 156 | 59 | 103 |
|          | 2156-200                  |                  |    |    |    |    |    |     |     |    |     |

For more accessories, please see product group 11



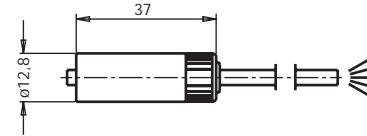
### Electrical installation

#### Pin assignment for three-wire proximity switches

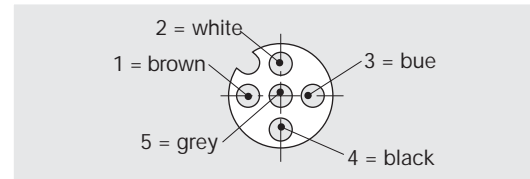


Supply voltage: 10-30 V DC  
 Constant current: ≤ 100 mA  
 Type: inductive, NC pnp

#### 5-pole connecting lead with screw coupling



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



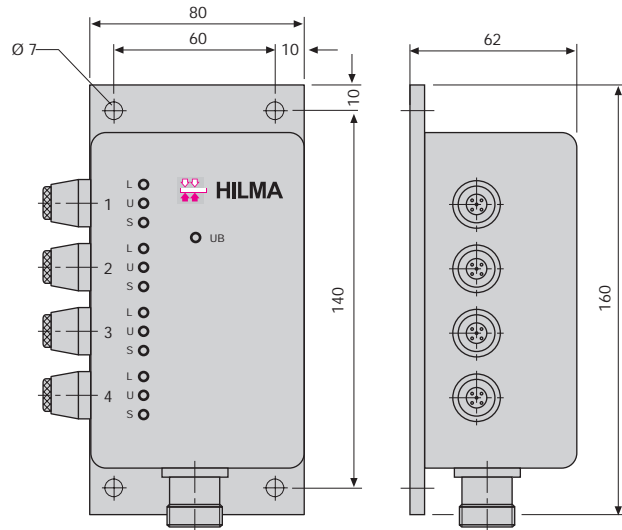
#### Distribution block with LED display for connecting 4 clamping elements

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 2 = L-
- 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
- Pin 15 = free
- Pin 16 = free

**L = Unclamping position**  
**U = Change-over position**  
**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 sink 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:

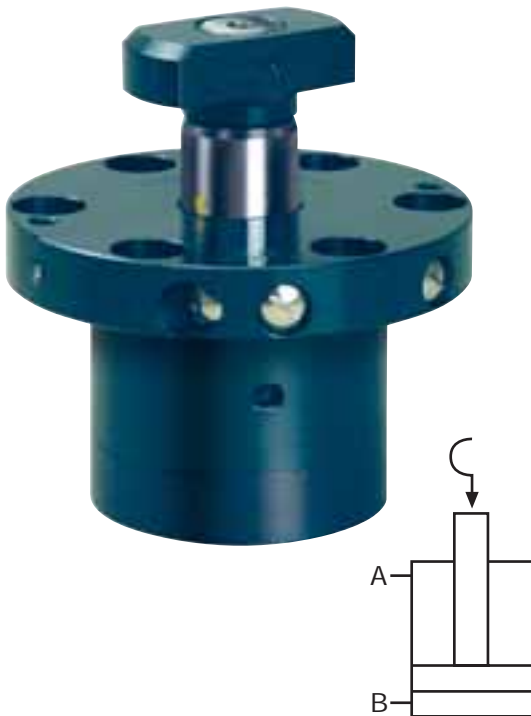
The full stroke of the piston must be realised, otherwise the swing mechanism may be damaged.



## Swing clamping element, double-acting



# HILMA



### 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 ( $\pm 1.5$  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).



# HILMA

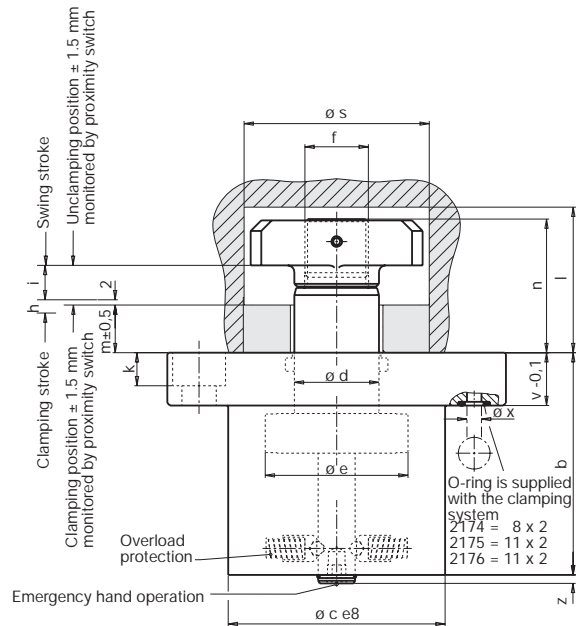
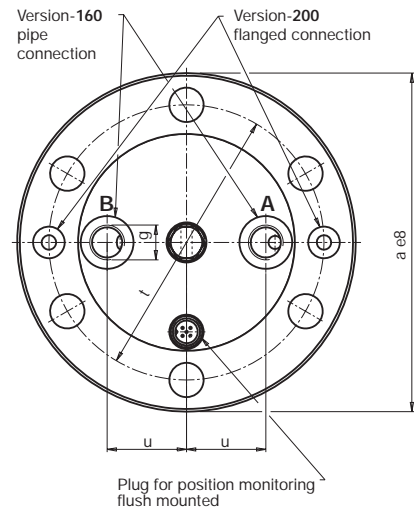


## Swing clamping element, double acting

Max. operating pressure 400 bar

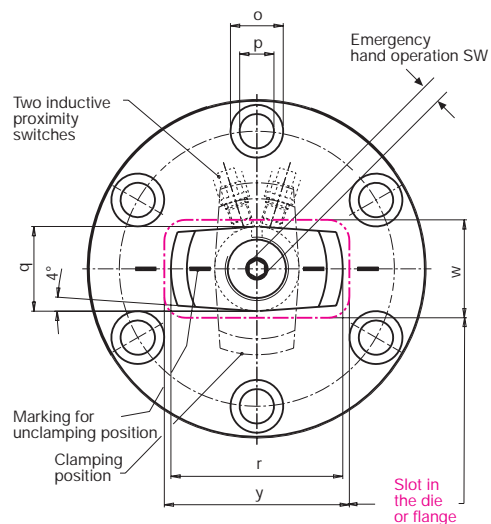
Other sizes and special versions are available on request.

|   |          |          |          |
|---|----------|----------|----------|
| 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 <sup>3</sup> )   | 22       | 52       | 107      |
| Oil consumption unclamping (cm <sup>3</sup> ) | 34       | 77       | 158      |
| Max. volume flow (cm <sup>3</sup> /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)  | 34       | 42       | 52       |
| 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)  | 38       | 47       | 59       |
| 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       |
| <b>Part no.</b>                               |          |          |          |
| with pipe connection                          | 2174-160 | 2175-160 | 2176-160 |
| with flanged connection                       | 2174-200 | 2175-200 | 2176-200 |



### Please note!

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



# 4.2170

02/2004

Hilma-Römheld GmbH

Schützenstraße 74 · D-57271 Hilchenbach

Phone +49 (0) 2733 / 281-0 · Fax +49 (0) 2733 / 281-113 · www.hilma.de

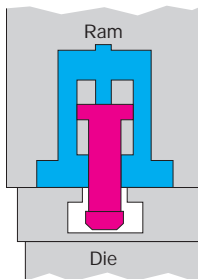
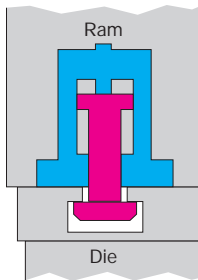
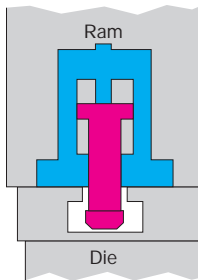
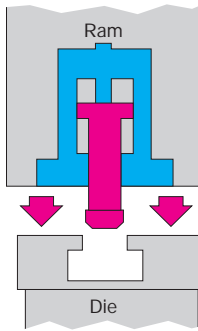
Subject to technical modification



# Swing clamping element double-acting



# HILMA



## Function

### Clamping

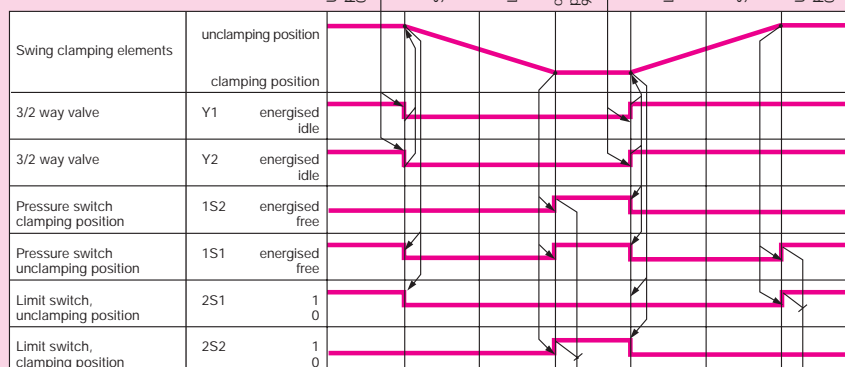
1. Push the die into the press with the swing clamping elements in the rest position.
2. Lower the press ram onto the upper part of the die. The tie rods of the swing clamping elements will pass through the clamping slots of the upper die.
3. The swing clamping elements are operated by means of a power 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

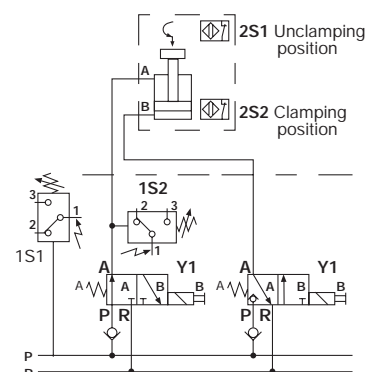
1. Move the dies together and return the swing clamping elements into the unclamping position by means of energising valves Y1 and Y2. The tie rod rotates by 90° and can then pass through the clamping slots of the upper die.
2. Move the press ram upwards and take the die out.

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

### Functional diagram



### Hydraulic schematics

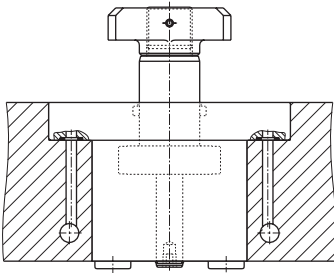




### Recommended installation

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

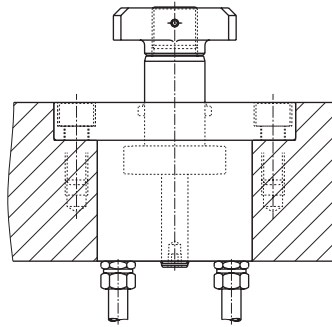
#### Flanged connection



Hydraulic oil is fed through the drilled holes in the bed and in the ram. There are no exposed conduits or screw fittings.

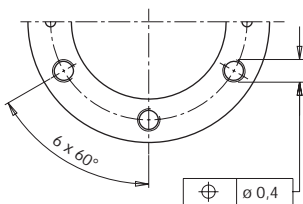
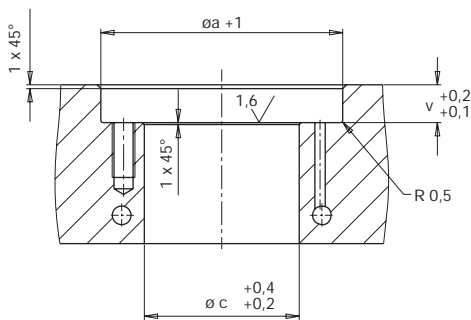
O-rings supplied with the clamping element provide for tight fitting. Easy installation, ease of servicing.

#### Pipe connection



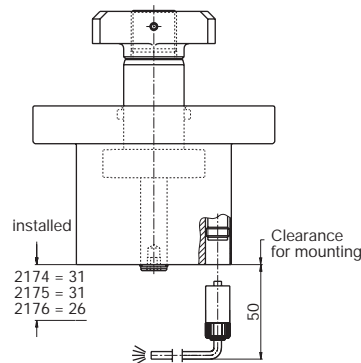
Pipes are recommended in applications where screw fittings are easily accessible and where pipes do not impede installation and dismantling of the swing clamps.

#### 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 6.

# Swing clamping element double-acting

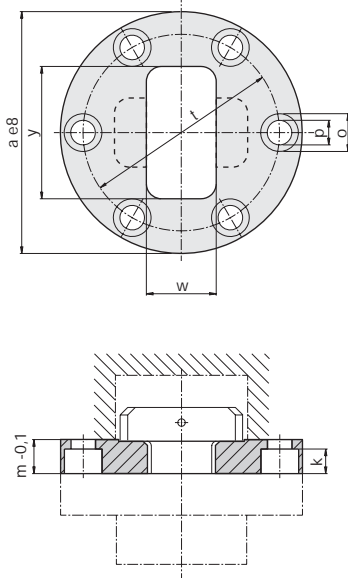


# HILMA

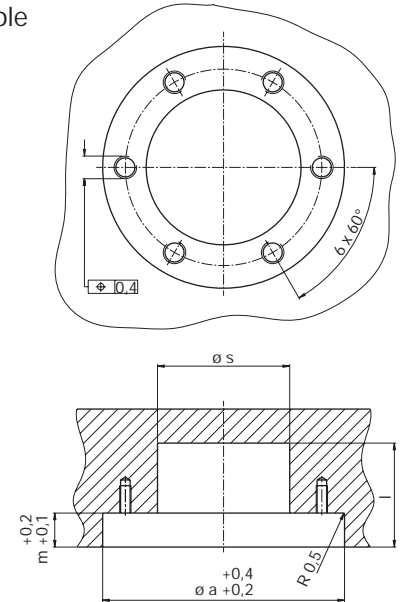
## Accessories

Flange as a clamping point for installation in press dies

Flange

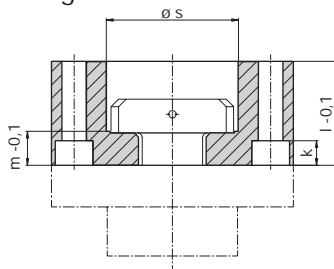


Location hole

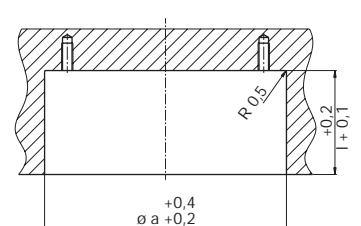


| Part no. | for clamping element type | Dimensions in mm |    |    |    |    |    |     |     |    |     |
|----------|---------------------------|------------------|----|----|----|----|----|-----|-----|----|-----|
|          |                           | a                | k  | l  | m  | o  | p  | s   | t   | w  | y   |
| 5700-016 | 2174-160                  | 128              | 13 | 55 | 18 | 20 | 13 | 70  | 104 | 38 | 70  |
|          | 2174-200                  |                  |    |    |    |    |    |     |     |    |     |
| 5700-017 | 2175-160                  | 160              | 17 | 70 | 23 | 26 | 18 | 86  | 130 | 47 | 86  |
|          | 2175-200                  |                  |    |    |    |    |    |     |     |    |     |
| 5700-018 | 2176-160                  | 192              | 21 | 87 | 28 | 33 | 22 | 103 | 156 | 59 | 103 |
|          | 2176-200                  |                  |    |    |    |    |    |     |     |    |     |

Flange



Location hole



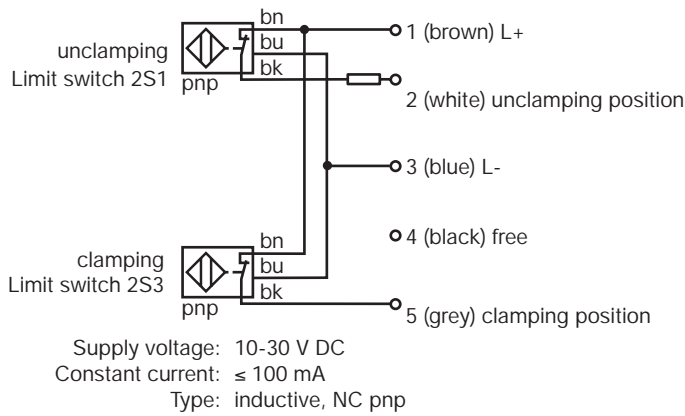
| Part no. | for clamping element type | Dimensions in mm |    |    |    |    |    |     |     |    |     |
|----------|---------------------------|------------------|----|----|----|----|----|-----|-----|----|-----|
|          |                           | a                | k  | l  | m  | o  | p  | s   | t   | w  | y   |
| 5700-019 | 2174-160                  | 128              | 13 | 55 | 18 | 20 | 13 | 70  | 104 | 38 | 70  |
|          | 2174-200                  |                  |    |    |    |    |    |     |     |    |     |
| 5700-020 | 2175-160                  | 160              | 17 | 70 | 23 | 26 | 18 | 86  | 130 | 47 | 86  |
|          | 2175-200                  |                  |    |    |    |    |    |     |     |    |     |
| 5700-021 | 2176-160                  | 192              | 21 | 87 | 28 | 33 | 22 | 103 | 156 | 59 | 103 |
|          | 2176-200                  |                  |    |    |    |    |    |     |     |    |     |

For more accessories, please see product group 11

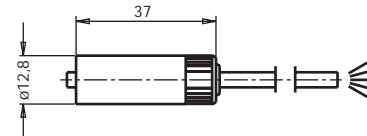


### Electrical installation

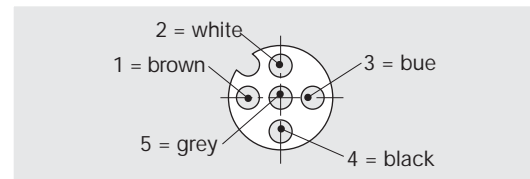
#### Pin assignment for three-wire proximity switches



#### 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!

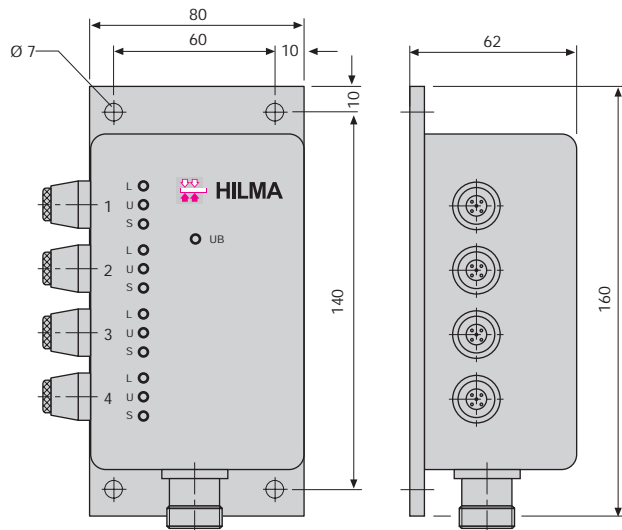
LED display of the unclamping, change-over and clamping position of each clamping element.

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.

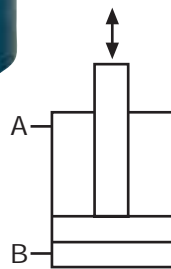
Provide a pressure gauge connection in every hydraulic circuit for adjustment and to check operational data.

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

## Pull clamping element double-acting



# HILMA



### Applications:

- ▶ integrated in press rams
- ▶ integrated in press bed
- ▶ in machine tools and equipment
- ▶ when the available space is limited

### Function:

Double acting pull clamping element for clamping dies on a press bed or press ram. The die must be provided with T-slots for the tie rod. It is important that the die is correctly pushed into the press, and is parallel with the clamping elements. The clamping and unclamping positions are monitored by inductive proximity switches. The tie rod and the piston are hardened and ground, and the hydraulic system is protected against dirt by wiper rings.

### Special features:

- ▶ Position monitoring ensures high functional safety
- ▶ Ideal power transmission with centrally arranged clamping elements
- ▶ Compact design
- ▶ Clamping force of between 60 and 164 kN
- ▶ Optimum use of bed and ram surfaces
- ▶ Die clamping in barely accessible positions
- ▶ Compensates for large clamping edge tolerances ( $\pm 1.5$  mm)

### For power units

please see product group 7

### For accessories

please see product group 11



Pull clamping elements in the press bed of a double column press. Easy die positioning is ensured by roller blocs in the T-slots of the press bed.



# HILMA

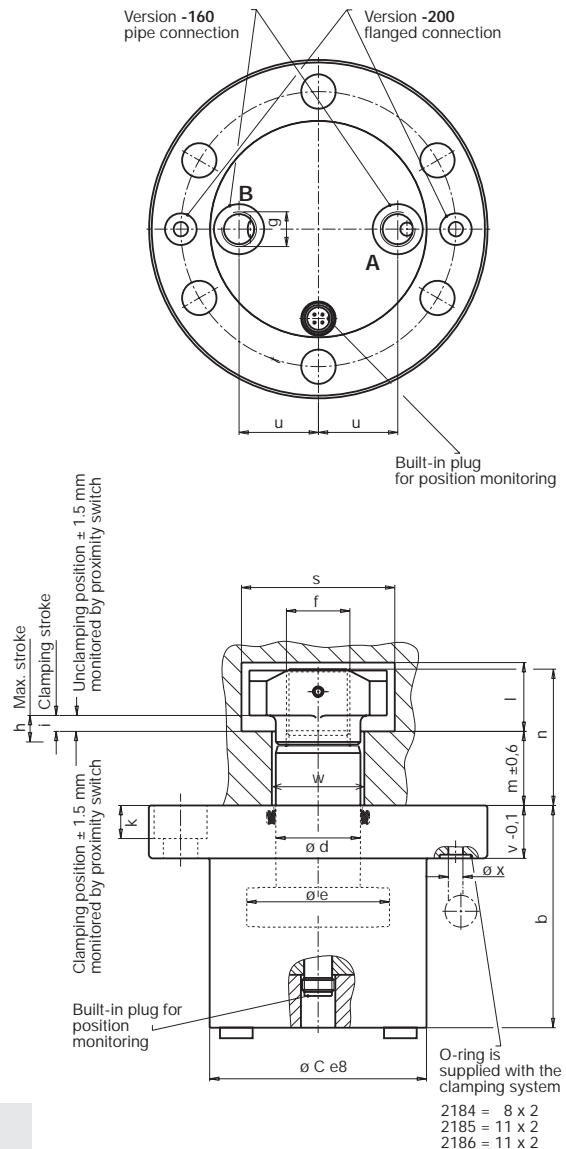


## Pull clamping element double-acting

Max. operating pressure 400 bar

Other sizes and special versions are available on request.

|  |                 |                 |                 |
|--|-----------------|-----------------|-----------------|
| <b>Pulling force at 400 bar (kN)</b>     | <b>60</b>       | <b>104</b>      | <b>164</b>      |
| Pulling force at 100 bar (kN)            | 15              | 26              | 41              |
| Piston $\varnothing e$ (mm)              | 54              | 70              | 88              |
| Piston rod $\varnothing d$ (mm)          | 32              | 40              | 50              |
| Max. stroke h (mm)                       | 10              | 10              | 10              |
| Oil consumption cl. (cm <sup>3</sup> )   | 10              | 16              | 25              |
| Oil consumption uncl. (cm <sup>3</sup> ) | 15              | 23              | 37              |
| a (mm)                                   | 128             | 160             | 192             |
| b (mm)                                   | 84              | 104             | 122             |
| c (mm)                                   | 82              | 104             | 126             |
| f (mm)                                   | M24x1,5         | M30x1,5         | M36 x 1,5       |
| g (mm)                                   | G 1/4           | G 3/8           | G 3/8           |
| i (mm)                                   | 6               | 6               | 6               |
| k (mm)                                   | 13              | 17              | 21              |
| l (mm)                                   | 26              | 35              | 41              |
| m (mm)                                   | 28              | 37              | 48              |
| n (mm)                                   | 51              | 68              | 85              |
| o (mm)                                   | 20              | 26              | 33              |
| p (mm)                                   | 13              | 18              | 22              |
| q (mm)                                   | □ 52            | ∅ 74            | □ 84            |
| r (mm)                                   | 65              | 74              | 95              |
| s (mm)                                   | 58              | 82              | 92              |
| t (mm)                                   | 104             | 130             | 156             |
| u (mm)                                   | 30              | 38              | 45              |
| v (mm)                                   | 20              | 28              | 35              |
| w (mm)                                   | 38              | 48              | 58              |
| x (mm)                                   | 5,5             | 7               | 7               |
| Weight (kg)                              | 4,4             | 9               | 15              |
| <b>Part no.</b>                          |                 |                 |                 |
| <b>with pipe connection</b>              | <b>2184-160</b> | <b>2185-160</b> | <b>2186-160</b> |
| <b>with flanged connection</b>           | <b>2184-200</b> | <b>2185-200</b> | <b>2186-200</b> |

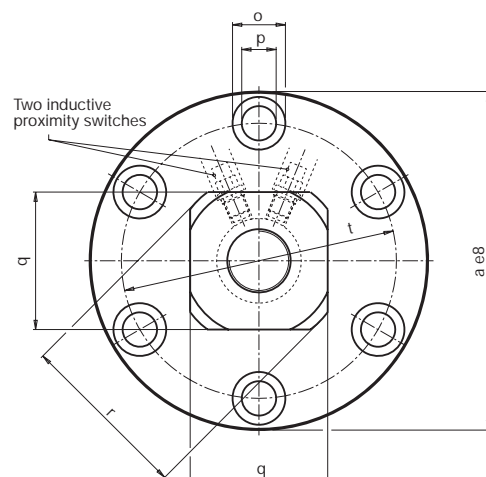


### Please note!

The piston rod is made from tempered steel. In the case of aggressive ambient conditions, a special material will be required.



Clamping of a complete die changing table with pull clamping elements.



## 4.2180

02/2004

Hilma-Römheld GmbH

Schützenstraße 74 · D-57271 Hilchenbach

Phone +49 (0) 2733 / 281-0 · Fax +49 (0) 2733 / 281-113 · www.hilma.de

Subject to technical modification

2



# Pull clamping element double-acting

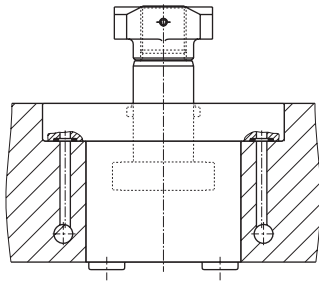


**HILMA**

## Recommended installation

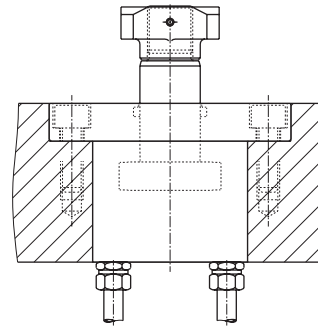
In order to ensure ease of servicing, two alternatives are offered for connecting the pull clamps.

### Flanged connection



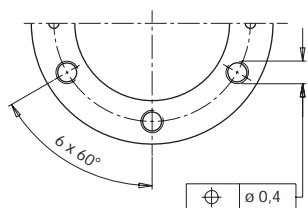
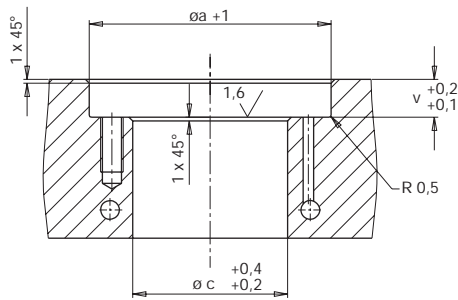
Hydraulic oil is fed through the drilled holes in the bed and in the ram. There are no exposed conduits or screw fittings. O-rings supplied with the clamping element provide for tight fitting. Easy installation, ease of servicing.

### Pipe connection



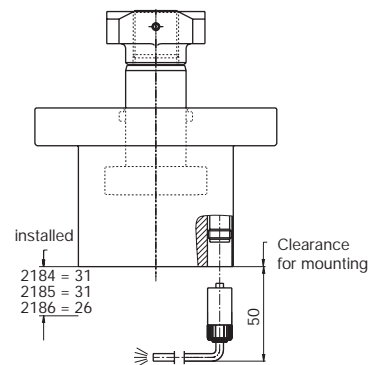
Pipes are recommended in applications where screw fittings are easily accessible and where pipes do not impede installation and dismantling of the pull clamping elements.

### Drilled hole for flanged or pipe connection



Flanged connection requires a plain and neat surface.

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

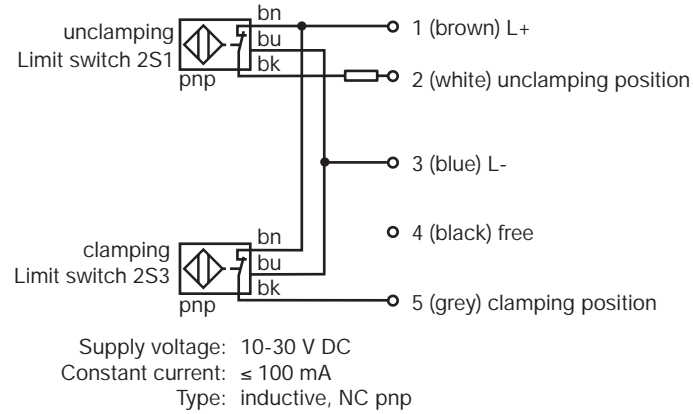


Both proximity switches are connected to the base of the pull clamp through a connecting lead with a screw coupling [IP 67]. The connecting lead must be ordered separately. Further installation may be carried out using a distribution block with an LED display, see page 4

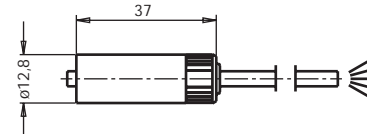


### Electrical installation

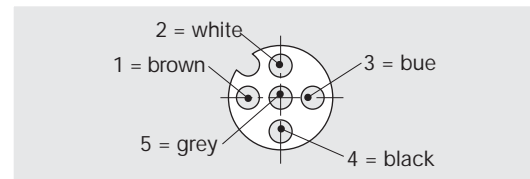
#### Pin assignment for three-wire proximity switches



#### 5-pole connecting lead with screw coupling



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



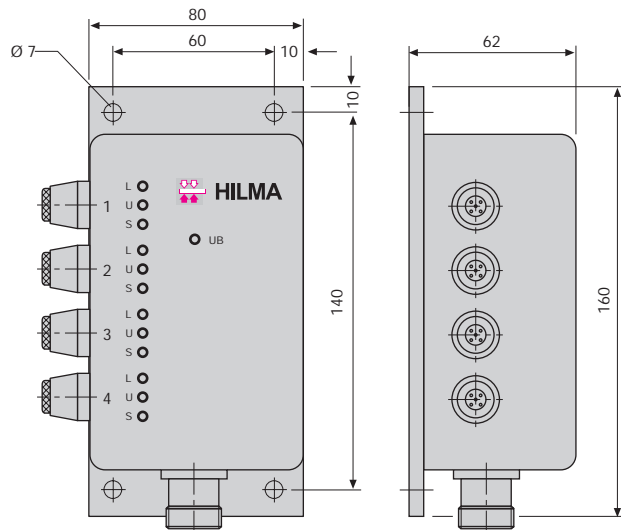
#### Distribution block with LED display for connecting 4 clamping elements

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 = 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

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



**Part no. 5700-015**

### Hydraulic installation

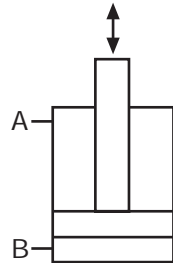
Read the operating instructions before commissioning the system.

Other parameters and recommendations are given in chapter no. 1 "General information".

# Pull clamping element with T-slot double-acting



**HILMA**



### Applications:

- ▶ installation in press rams
- ▶ installation in press beds
- ▶ integrated in a spacer plate
- ▶ when the available space is limited

### Function:

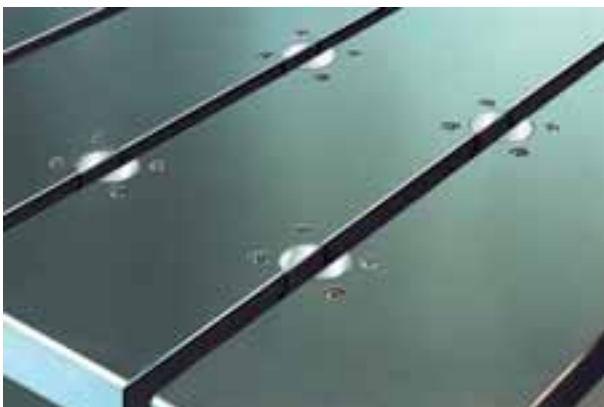
The pull clamping element with a T-slot facilitates the standardisation of dies using T-slot bars or T-nuts which are fastened to the die. The hydraulic oil is fed either through the drilled holes in the bed and the ram or through pipes.

The tie rod and the piston are hardened and ground, and the hydraulic system is protected against dirt by wiper rings.

### Special features:

- ▶ Compact design
- ▶ The bed and ram can also be used for manual clamping
- ▶ Ideal power transmission with centrally arranged clamping elements
- ▶ Optimum use of bed and ram surfaces

**For power units**  
please see product group 7



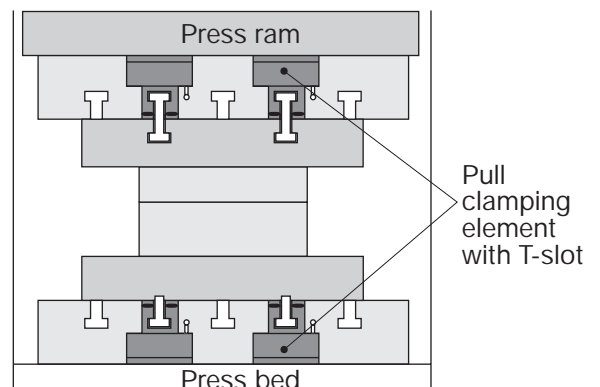
Pull clamping elements with T-slot installed in a press bed

### Example of application:

Die clamping in a press

Ram: Clamping of the upper die using double T-slot bars

Bed: Clamping of the lower die using firmly mounted T-slot bars





# HILMA



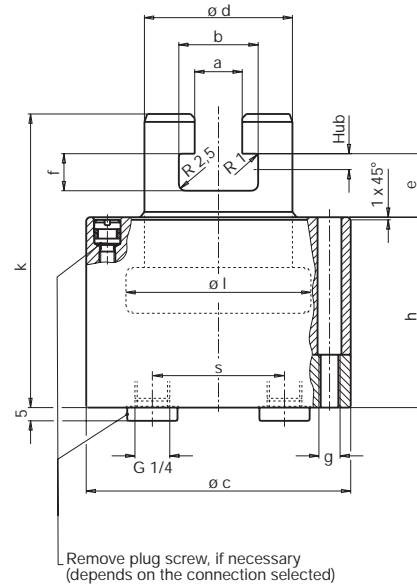
## Pull clamping element with T-slot double-acting

Max. operating pressure 400 bar

Other sizes and special versions are available on request.

| For T-slot to DIN 650                    | 18       | 22       | 28       |
|--|----------|----------|----------|
| Clamping force at 400 bar (kN)           | 55,2     | 76       | 144      |
| Clamping force at 100 bar (kN)           | 13,8     | 19       | 36       |
| Piston Ø l (mm)                          | 70       | 80       | 105      |
| Piston rod Ø d H7/f7 (mm)                | 56       | 63       | 80       |
| Stroke (mm)                              | 6        | 6        | 6        |
| Oil consumption cl. (cm <sup>3</sup> )   | 9        | 12       | 22       |
| Oil consumption uncl. (cm <sup>3</sup> ) | 23       | 30       | 52       |
| a (mm)                                   | 18       | 22       | 28       |
| b (mm)                                   | 30       | 37       | 46       |
| c (mm)                                   | 100      | 115      | 150      |
| e (mm)                                   | 24       | 28       | 32       |
| f (mm)                                   | 14       | 18       | 22       |
| g (mm)                                   | M8       | M10      | M12      |
| h (mm)                                   | 72       | 78       | 78       |
| k (mm)                                   | 111      | 125      | 135      |
| n (mm)                                   | 15,5     | 19,5     | 25,5     |
| o ± 0,05 (mm)                            | 42       | 47,5     | 62,5     |
| p (mm)                                   | 29,7     | 33,6     | 44,2     |
| s (mm)                                   | 50       | 56       | 70       |
| Weight (kg)                              | 4,1      | 5,8      | 10       |
| Part no                                  | 2354-050 | 2355-050 | 2356-050 |

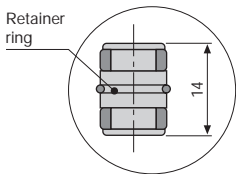
### Pull clamping element



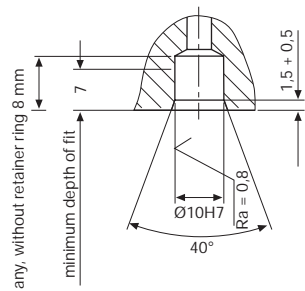
Accessories (for ordering with the clamping elements):

**Plug-in connector for flanged connection**  
Part no. 9210-132

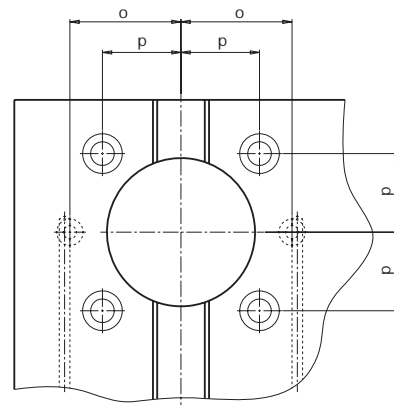
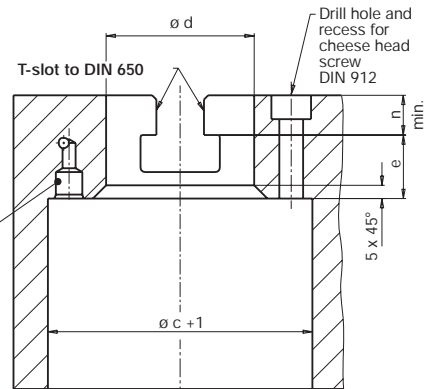
### Plug-in connector



### Accommodation space



### Drilled location hole



### Important information

Make sure that the T-slot of the clamping piston is subject to an axial load only. The T-nut must be in contact over its complete surface. Transverse loads must be avoided.

In view of the surface ratio of the pull clamping elements, only check valves having a minimum ratio of 3.5 : 1 may be used for maintaining the clamping force.

4.2350

02/2004

Hilma-Römheld GmbH

Schützenstraße 74 · D-57271 Hilchenbach

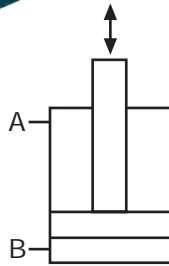
Phone +49 (0) 2733 / 281-0 · Fax +49 (0) 2733 / 281-113 · www.hilma.de

Subject to technical modification

# Pull clamping element with T-slot double-acting



**HILMA**



## Applications:

- ▶ installation in press rams
- ▶ installation in press bed
- ▶ integrated in spacer plate
- ▶ when the available space is limited

## Function:

The pull clamping element with a T-slot facilitates significantly the standardisation of dies using T-slot bars or T-nuts which are fastened to the die. The hydraulic oil is fed either through the drilled holes in the bed and the ram or through pipes. The tie rod and the piston are hardened and ground, and the hydraulic system is protected against dirt by wiper rings.

## Special features:

- ▶ Installation directly in the bed or in the ram
- ▶ Compact design
- ▶ Dies are easily adaptable
- ▶ The bed and ram can also be used for manual clamping
- ▶ Ideal power transmission with centrally arranged clamping elements
- ▶ Optimum use of bed and ram surfaces

## For power units

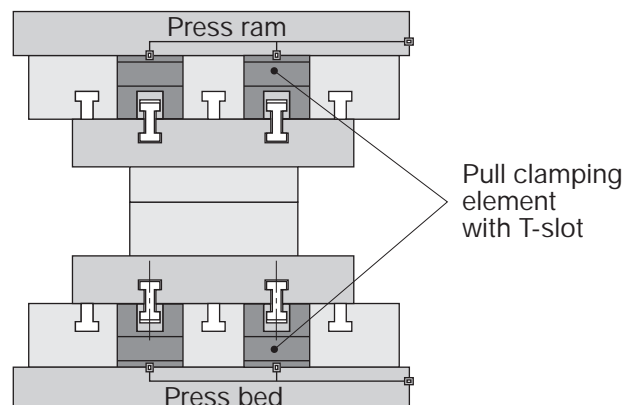
please see product group 7

## Example of application:

Die clamping in a press

Ram: Clamping of the upper die using double T-slot bars

Bed: Clamping of the lower die using firmly mounted T-slot bars





# HILMA



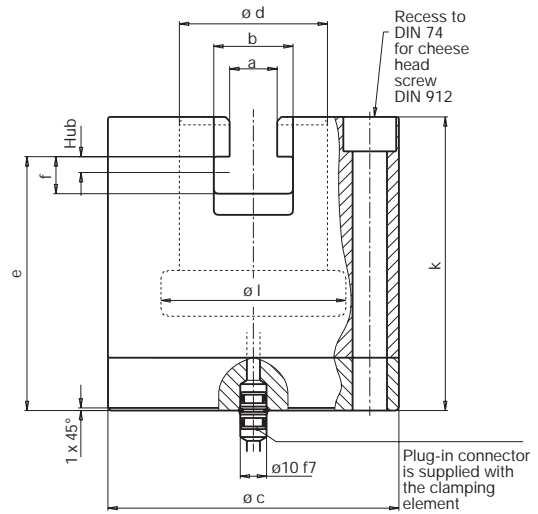
## Pull clamping element with T-slot double-acting

Max. operating pressure 400 bar

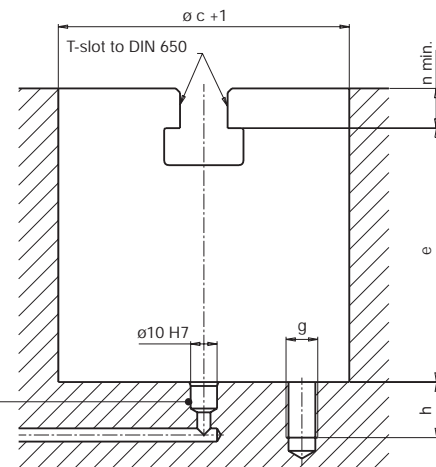
Other sizes and special versions are available on request.

| For T-slot to DIN 650                    | 18       | 22       | 28       |
|--|----------|----------|----------|
| Clamping force at 400 bar (kN)           | 55,2     | 76       | 144      |
| Clamping force at 100 bar (kN)           | 13,8     | 19       | 36       |
| Piston Ø l (mm)                          | 70       | 80       | 105      |
| Piston rod Ø d H7/f7 (mm)                | 56       | 63       | 80       |
| Stroke (mm)                              | 6        | 6        | 6        |
| Oil consumption cl. (cm <sup>3</sup> )   | 9        | 12       | 22       |
| Oil consumption uncl. (cm <sup>3</sup> ) | 23       | 30       | 52       |
| a (mm)                                   | 18       | 22       | 28       |
| b (mm)                                   | 30       | 37       | 46       |
| c e 8 (mm)                               | 110      | 130      | 166      |
| e (mm)                                   | 96       | 106      | 110      |
| f (mm)                                   | 14       | 18       | 22       |
| g (mm)                                   | M12      | M16      | M20      |
| h (mm)                                   | 21       | 23       | 27       |
| k (mm)                                   | 111      | 125      | 135      |
| n (mm)                                   | 15,5     | 19,5     | 25,5     |
| o (mm)                                   | 31,1     | 36,2     | 46,7     |
| p ± 0,05 (mm)                            | 15       | 15       | 15       |
| Weight (kg)                              | 6,1      | 9,5      | 16,6     |
| Part no.                                 | 2354-060 | 2355-060 | 2356-060 |
| Connection lengthways to the T-slot      |          |          |          |
| Part no.                                 | 2354-065 | 2355-065 | 2356-065 |
| Connection crosswise to the T-slot       |          |          |          |

### Pull clamping element

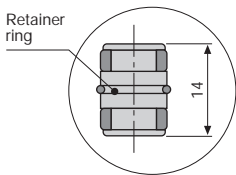


### Drilled location hole

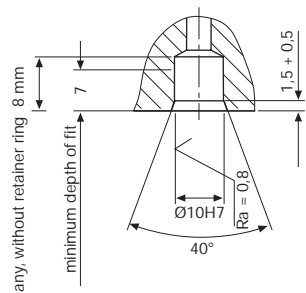


Plug-in connector for flanged connection  
Part no. 9210-132  
(is supplied with the clamping element)

### Plug-in connector

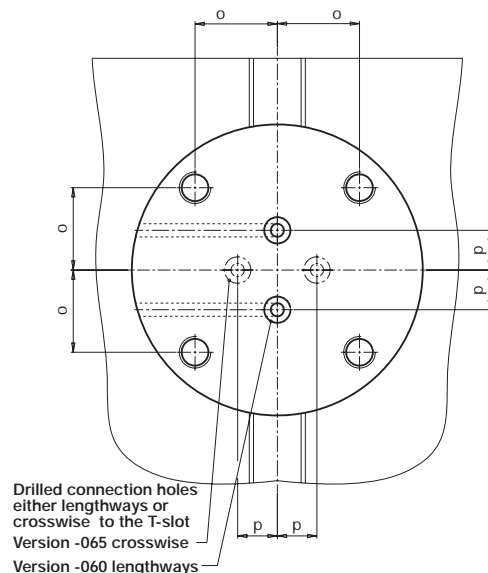


### Accommodation space



### Important information

Make sure that the T-slot of the clamping piston is subject to an axial load only. The T-nut must be in contact over its complete surface. Transverse loads must be avoided. In view of the surface ratio of the pull clamping elements, only check valves having a minimum ratio of 3.5 : 1 may be used for maintaining the clamping force.



4.2351

02/2004

Hilma-Römheld GmbH

Schützenstraße 74 · D-57271 Hilchenbach

Phone +49 (0) 2733 / 281-0 · Fax +49 (0) 2733 / 281-113 · www.hilma.de

Subject to technical modification