Swing clamping element, double-acting

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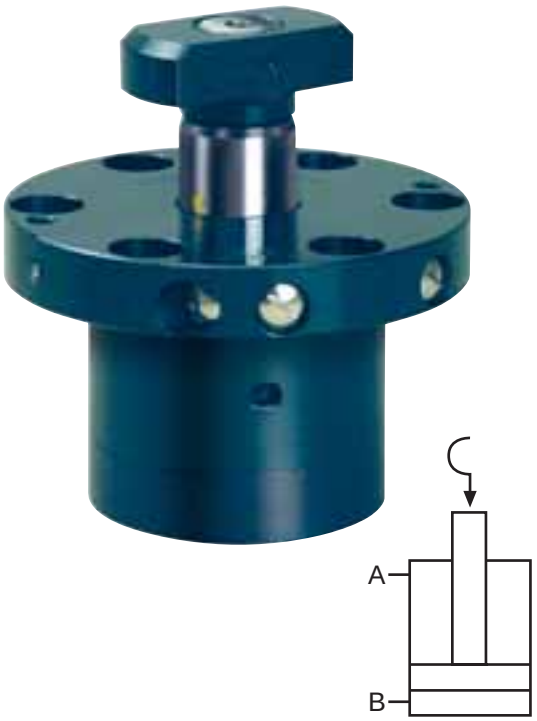

Applications:

- 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).

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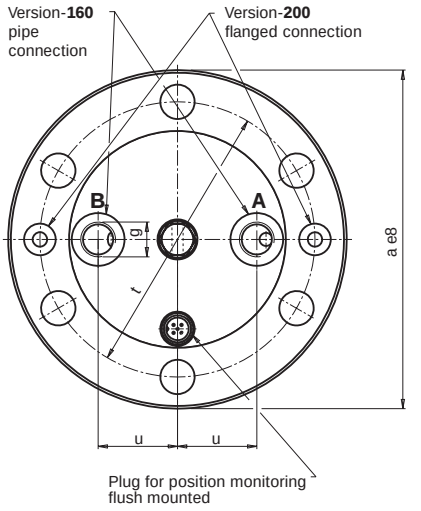
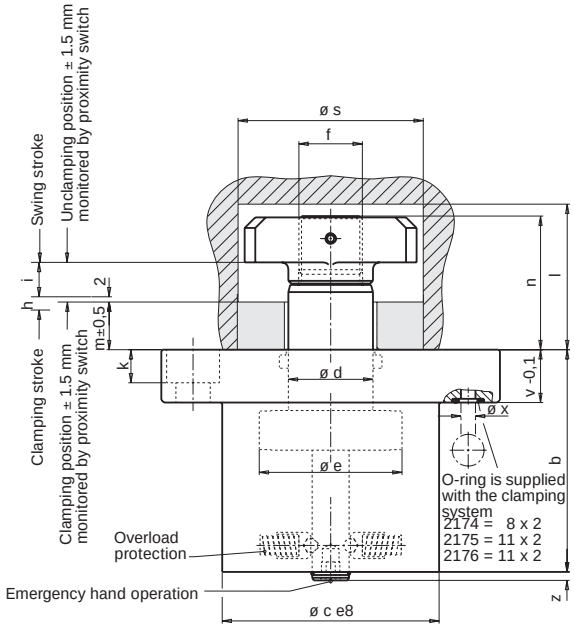
Swing clamping element, double acting

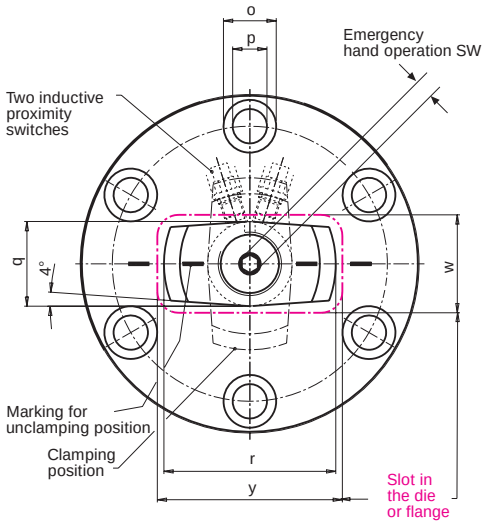
Max. operating pressure 400 bar
Other sizes and special versions are available on request.

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^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	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
Part no.			
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.



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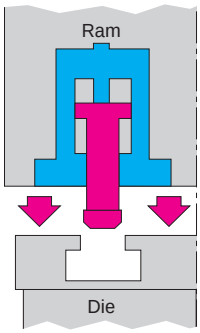
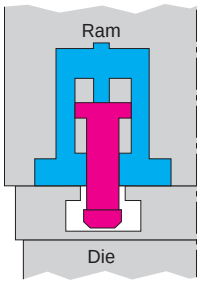


Function

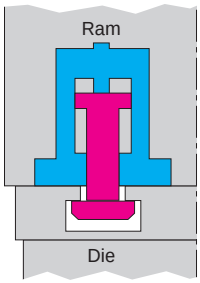
Clamping

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.



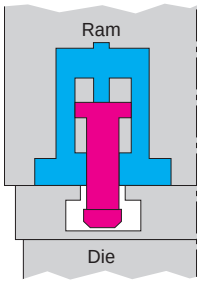
3. The swing clamping elements are operated by means of a power unit. The tie rod rotates by 90° and is then in a transverse position to the clamping point. The upper die is hydraulically clamped. Once the clamping pressure has been reached the power unit will be switched off through pressure switch 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

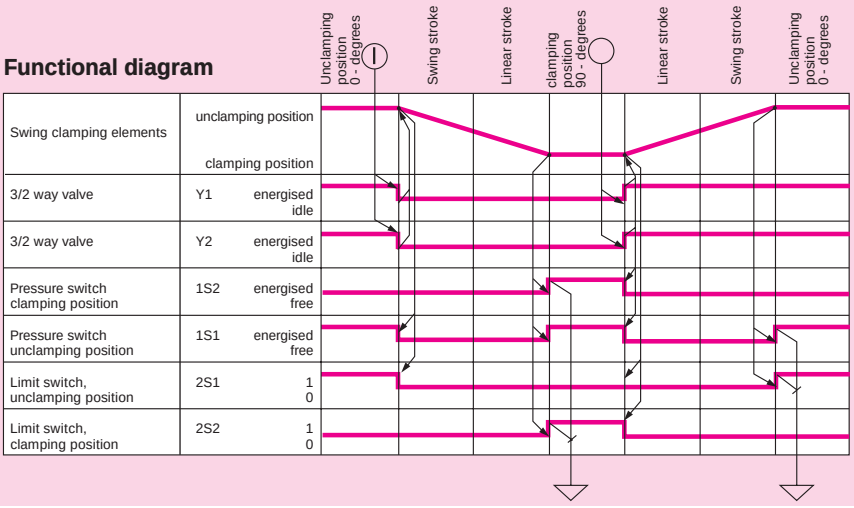
1. Move the dies together and return the swing clamping elements into the unclamping position by means of energising valves Y1 and Y2. The tie rod rotates by 90° and can then pass through the clamping slots of the upper die.

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



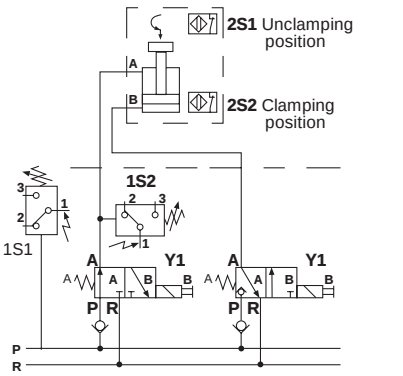
The clamping and unclamping positions are monitored by inductive proximity switches.

Functional diagram



Swing clamping elements	unclamping position clamping position	
3/2 way valve	Y1	energised idle
3/2 way valve	Y2	energised idle
Pressure switch clamping position	1S2	energised free
Pressure switch unclamping position	1S1	energised free
Limit switch, unclamping position	2S1	1 0
Limit switch, clamping position	2S2	1 0

Hydraulic schematics



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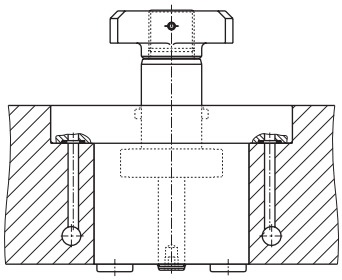
Recommended installation

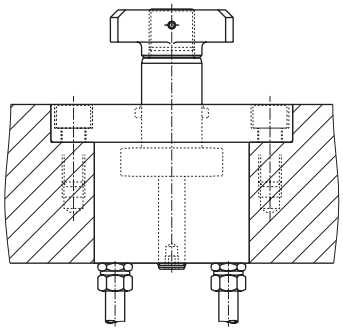
In order to ensure ease of servicing, two alternatives are offered for connecting the swing clamps.

Flanged connection



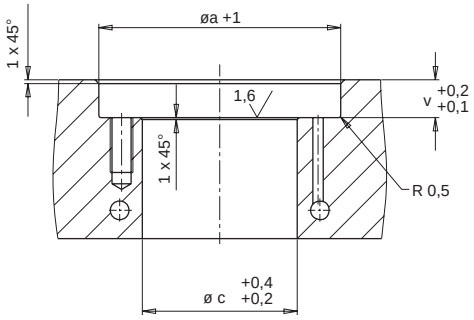
Hydraulic oil is fed through the drilled holes in the bed and in the ram. There are no exposed conduits or screw fittings.
O-rings supplied with the clamping element provide for tight fitting. Easy installation, ease of servicing.

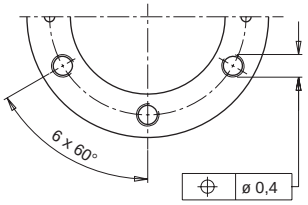
Pipe connection



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

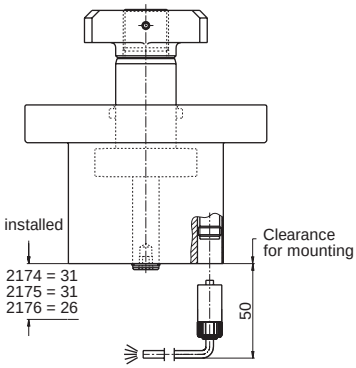
Drilled hole for flange or pipe connection





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 6.

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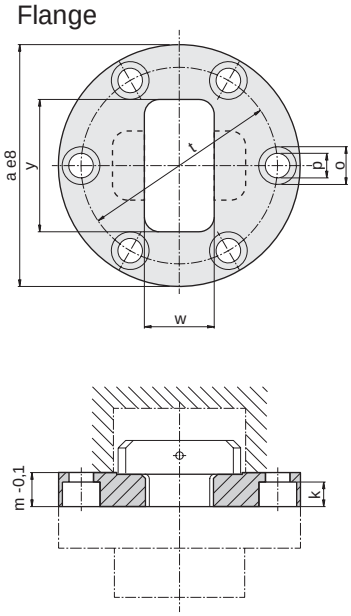
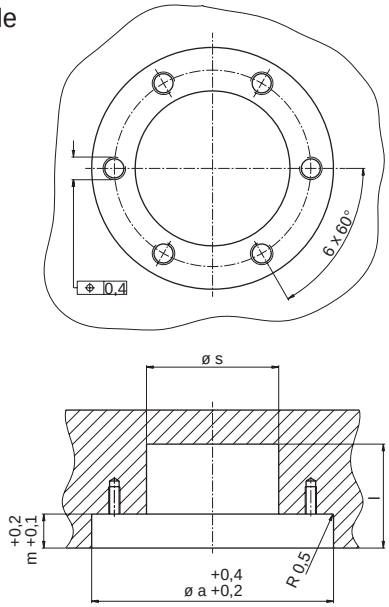
Accessories

Flange as a clamping point for installation in press dies

Flange

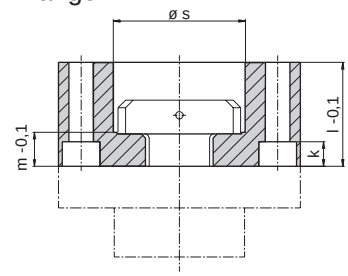


Location hole

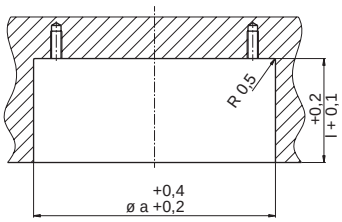


Part no.	for clamping element type	Dimensions in mm a	k	l	m	o	p	s	t	w	y
5700-016	2174-160 2174-200	128	13	55	18	20	13	70	104	38	70
5700-017	2175-160 2175-200	160	17	70	23	26	18	86	130	47	86
5700-018	2176-160 2176-200	192	21	87	28	33	22	103	156	59	103

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 2174-200	128	13	55	18	20	13	70	104	38	70
5700-020	2175-160 2175-200	160	17	70	23	26	18	86	130	47	86
5700-021	2176-160 2176-200	192	21	87	28	33	22	103	156	59	103

For more **accessories**, please see product group 11

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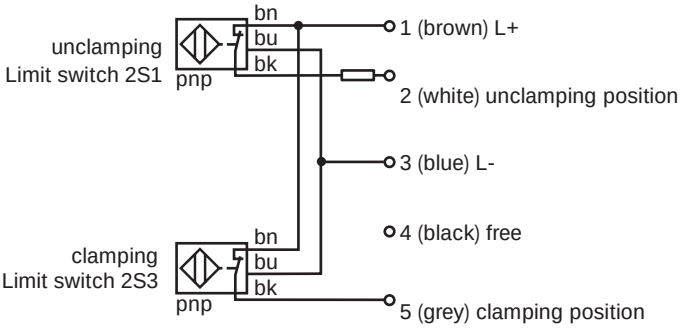
Swing clamping element double-acting

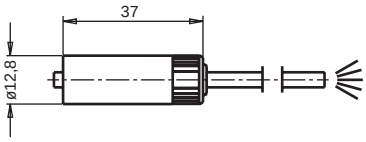
Electrical installation

Pin assignment for three-wire proximity switches

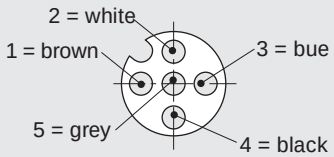


Supply voltage: 10-30 V DC
Constant current: ≤ 100 mA
Type: inductive, NC pnp

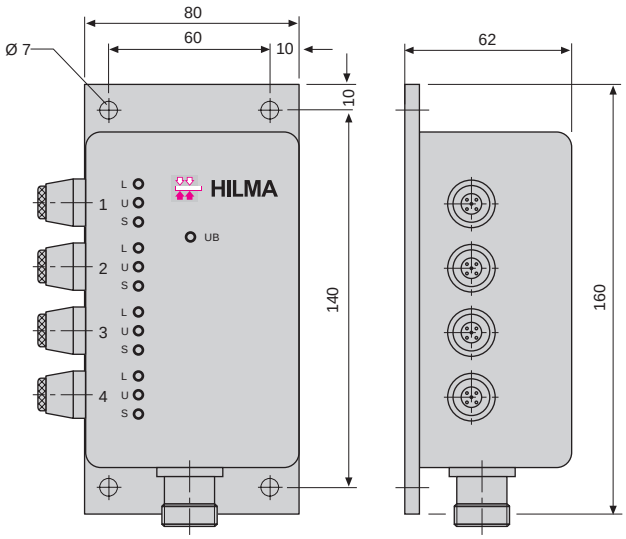
5-pole connecting lead with screw coupling



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



Part no. 5700-015

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 = not assigned
S = Clamping position

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”.

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Pull clamping element double-acting

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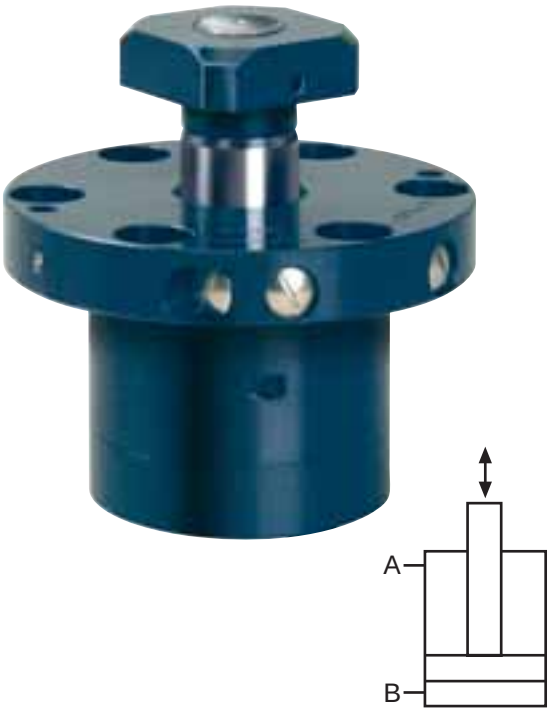

Applications:

- 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 (± 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.

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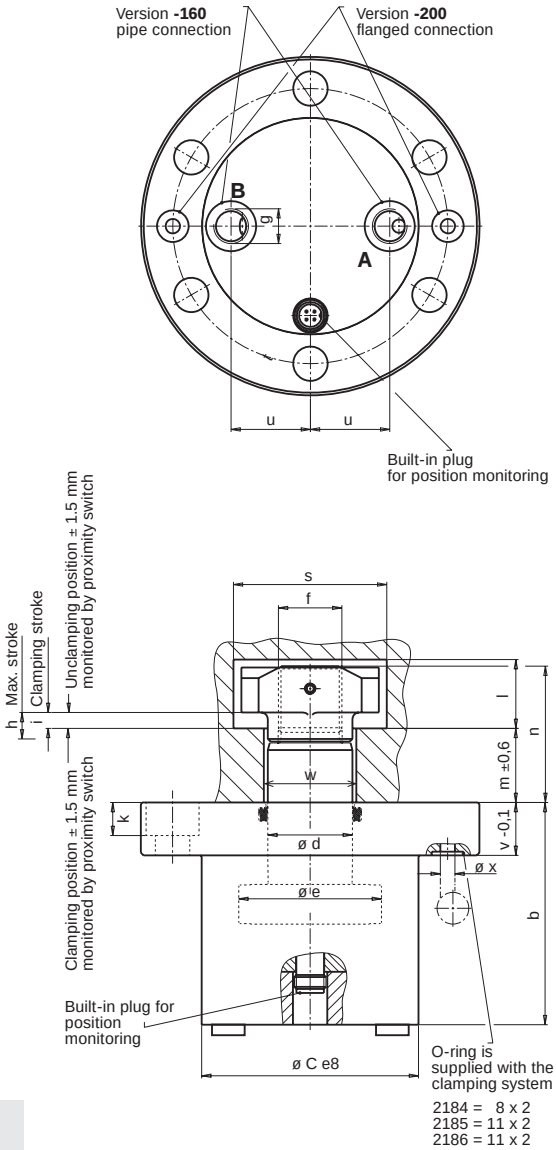
Pull clamping element double-acting

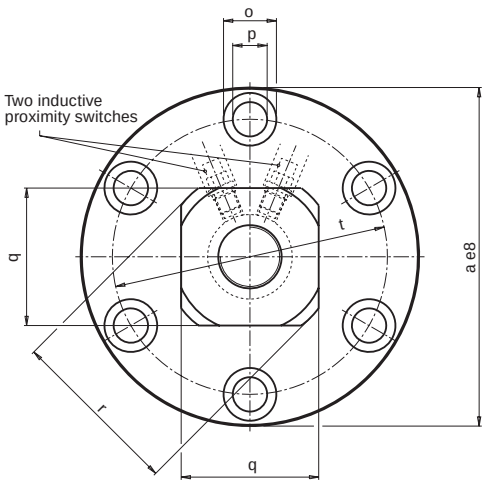
Max. operating pressure 400 bar
Other sizes and special versions are available on request.

Pulling force at 400 bar (kN)	**60**	**104**	**164**
Pulling force at 100 bar (kN)	15	26	41
Piston Ø e (mm)	54	70	88
Piston rod Ø d (mm)	32	40	50
Max. stroke h (mm)	10	10	10
Oil consumption cl. (cm^3)	10	16	25
Oil consumption uncl. (cm^3)	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	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	Ø 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
Part no.			
with pipe connection	**2184-160**	**2185-160**	**2186-160**
with flanged connection	**2184-200**	**2185-200**	**2186-200**



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.



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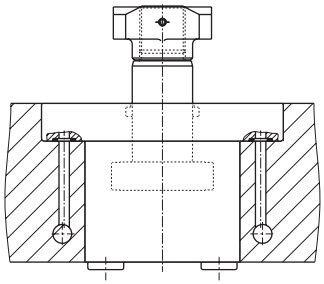
Recommended installation

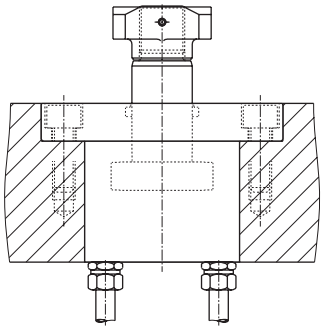
In order to ensure ease of servicing, two alternatives are offered for connecting the pull clamps.

Flanged connection



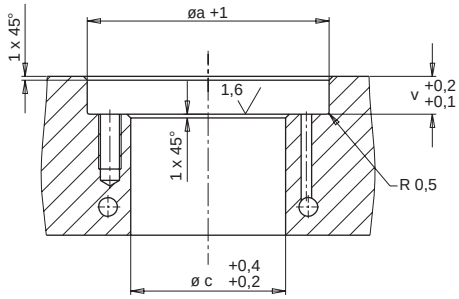
Hydraulic oil is fed through the drilled holes in the bed and in the ram. There are no exposed conduits or screw fittings.
O-rings supplied with the clamping element provide for tight fitting. Easy installation, ease of servicing.

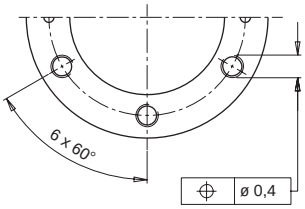
Pipe connection



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.

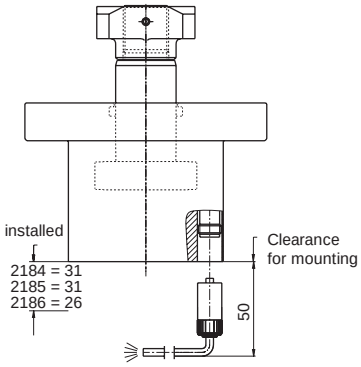
Drilled hole for flanged or pipe connection





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

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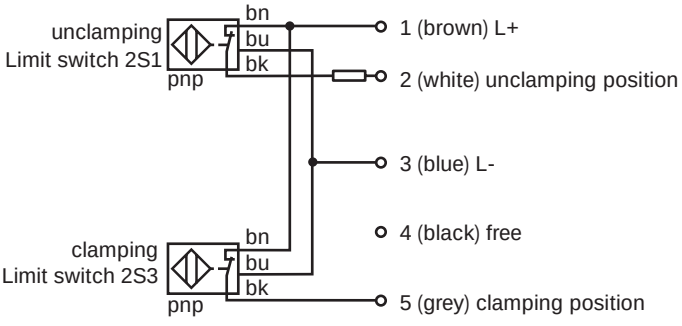
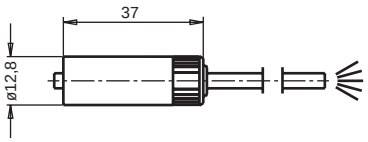
Electrical installation

Pin assignment for three-wire proximity switches

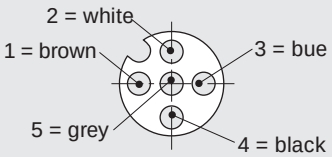


Supply voltage: 10-30 V DC
Constant current: ≤ 100 mA
Type: inductive, NC pnp

5-pole connecting lead with screw coupling

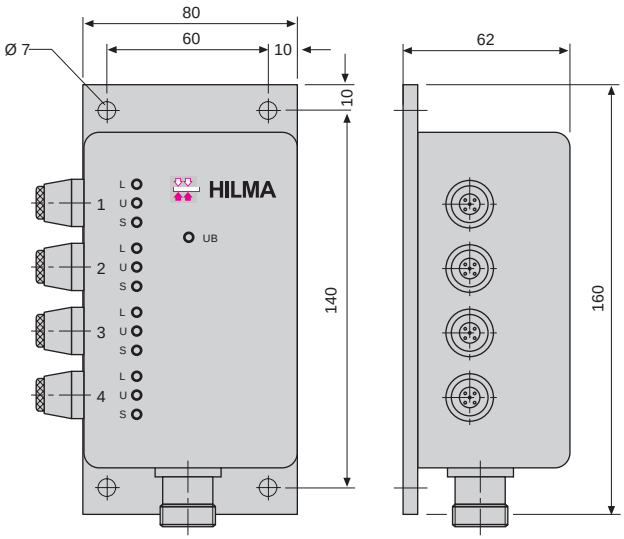


Cable length 5 m	**Part no. 5700-013**
Cable length 10 m	**Part no. 5700-014**



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



Part no. 5700-015

Wiring 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

Hydraulic installation

Read the operating instructions before commissioning the system.

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

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Pull clamping element with T-slot double-acting

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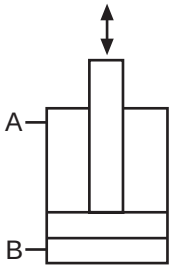


Applications:

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

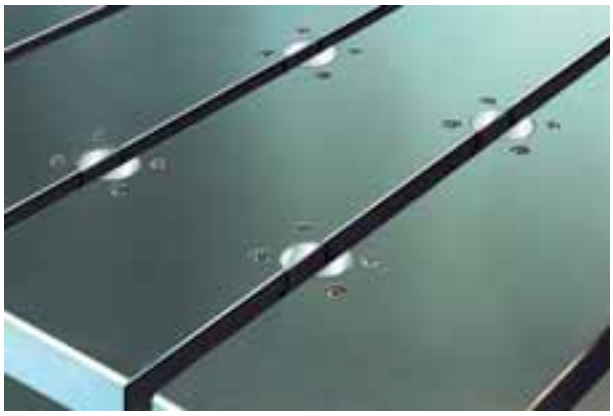
Function:

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

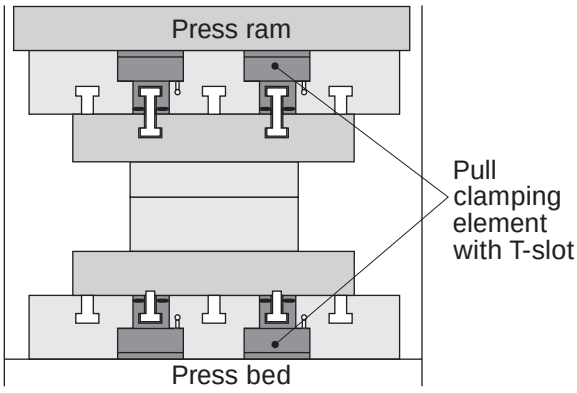


Pull clamping elements with T-slot installed in a press bed

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



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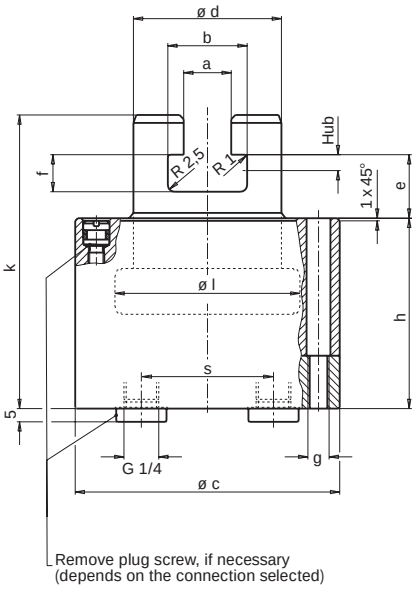
Pull clamping element with T-slot double-acting

Max. operating pressure 400 bar
Other sizes and special versions are available on request.

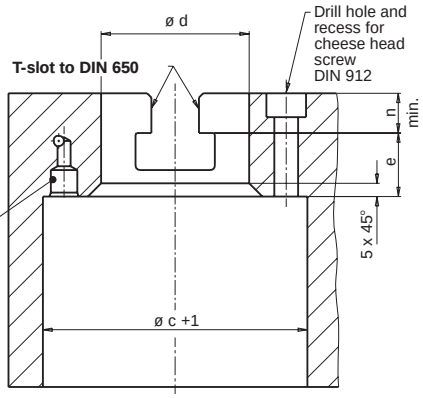
For T-slot to DIN 650	18	22	28
Clamping force at 400 bar (kN)	55,2	76	144
Clamping force at100 bar (kN)	13,8	19	36
Piston Ø l (mm)	70	80	105
Piston rod Ø d H7/f7 (mm)	56	63	80
Stroke (mm)	6	6	6
Oil consumption cl. (cm^3)	9	12	22
Oil consumption uncl. (cm^3)	23	30	52
a (mm)	18	22	28
b (mm)	30	37	46
c (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

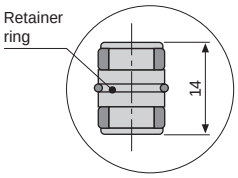


Accessories (for ordering with the clamping elements):
Plug-in connector for flanged connection
Part no. 9210-132

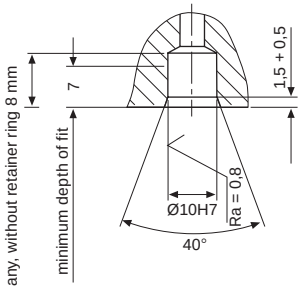
Drilled location hole

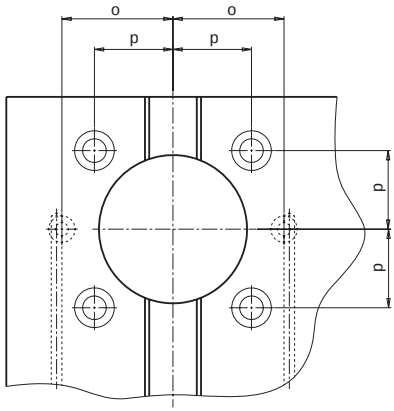


Plug-in connector



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.

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Pull clamping element with T-slot double-acting

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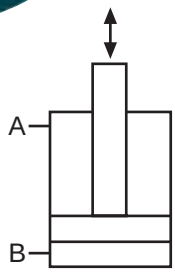


Applications:

- 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:

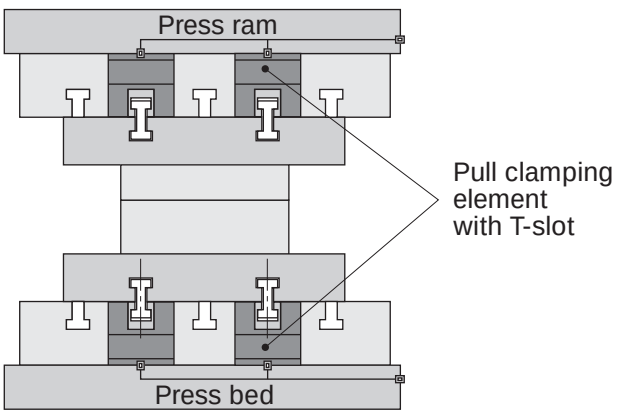
- Installation directly in the bed or in the ram
- Compact design
- Dies are easily adaptable
- The bed and ram can also be used for manual clamping
- Ideal power transmission with centrally arranged clamping elements
- Optimum use of bed and ram surfaces

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



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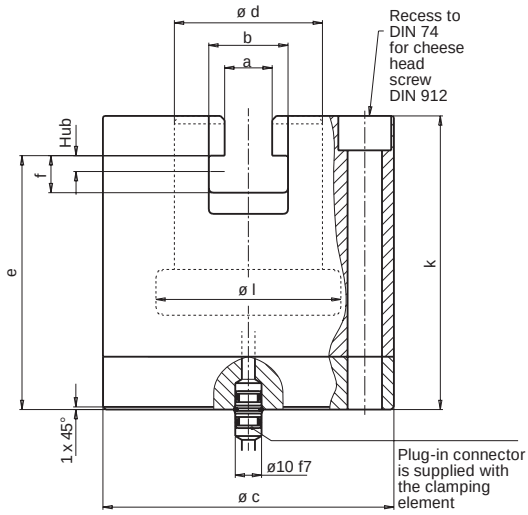
Pull clamping element with T-slot double-acting

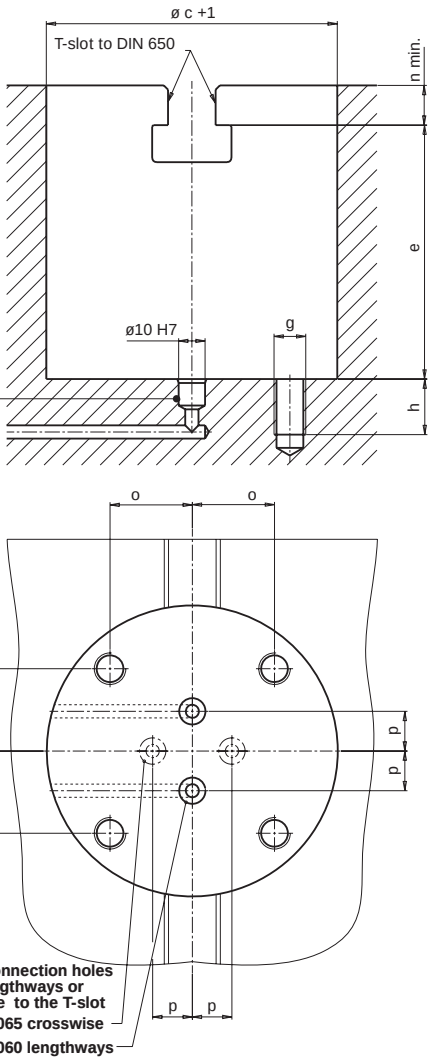
Max. operating pressure 400 bar
Other sizes and special versions are available on request.

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^3)	9	12	22
Oil consumption uncl.	(cm^3)	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. Connection lengthways to the T-slot		**2354-060**	**2355-060**	**2356-060**
Part no. Connection crosswise to the T-slot		**2354-065**	**2355-065**	**2356-065**

Pull clamping element

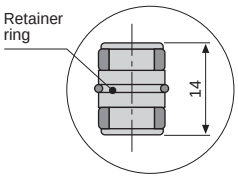


Drilled location hole

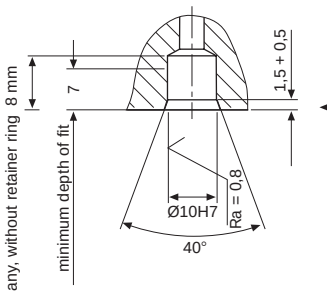


Plug-in connector for flanged connection
Part no. 9210-132
(is supplied with the clamping element)

Plug-in connector



Accommodation space



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