



**Program summary**

# HINGE CLAMPS and CLAMPS

**Mini hinge clamps**

**Hinge clamps**

**Compact clamps**

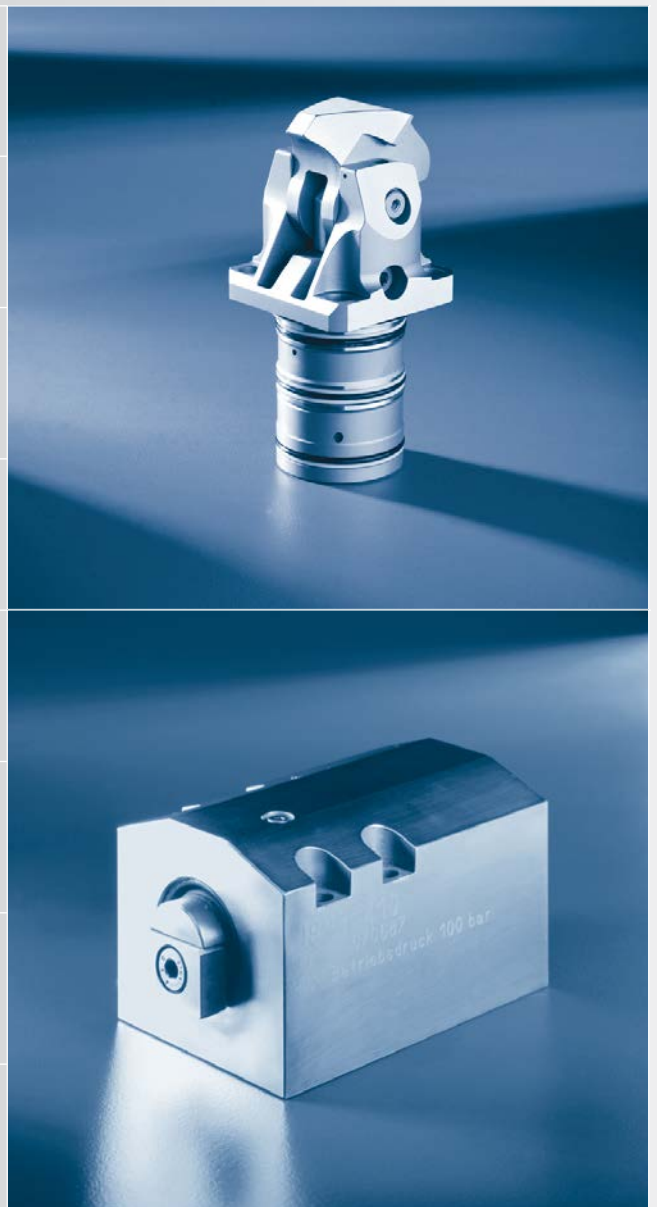
**Hinge clamps with flat clamping lever**

**Position flexible clamps**

**Flat clamps**

**Block clamps**

**Slide pivot clamps**



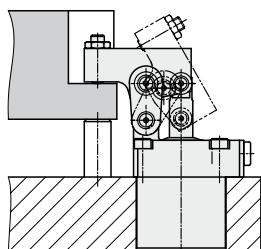


**Application**

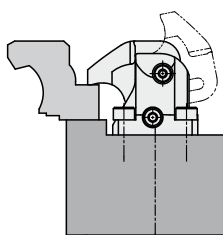
Hydraulic hinge clamps are used for clamping of workpieces, when it is essential to keep the clamping area free of straps and clamping components for unrestricted workpiece loading and unloading.

**Function**

The **hinge clamp** is a double-acting hydraulic cylinder with integrated clamping lever. When pressurising the element, the piston moves upwards and swivels the clamping lever over a hinge forwards and at the same time downwards onto the workpiece. The piston force is deviated by 180° and, depending on the lever length, the force is available as clamping force.

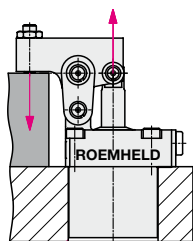


The **compact clamp** is a double-acting pull-type cylinder where a part of the linear stroke is used to swing the clamping lever onto the workpiece. The piston pull force is directly converted to clamping force less the friction losses.

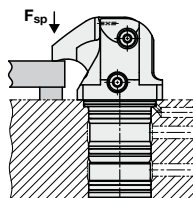


**Workpiece clamping without any side loads**

The **hinge clamp** allows clamping without side loads, if the clamping point is exactly on the height of the pivot point of the lever. If the clamping point is within the indicated clamping range, the side load can be neglected.

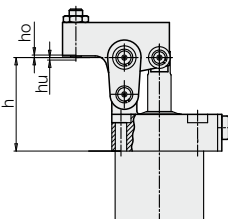


In the case of the **compact clamp**, no side load can occur, since the clamping lever moves only vertically in parallel to the piston axis. Swinging away of the clamping lever is only made outside the usable clamping range.

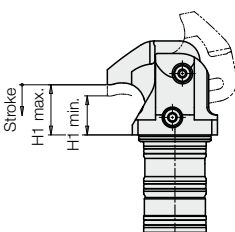


**Clamping height and clamping range**

On the data sheets of the **hinge clamps**, the optimum workpiece height  $h$  is indicated. At this height, the clamping force acts exactly vertically onto the workpiece. The clamping range ( $h_o + h_u$ ) is practically the tolerable deviation of the workpiece height. The clamping lever has still a sufficient stroke reserve.



For the **compact clamp**, there is no optimum workpiece height, since the clamping lever moves in a straight line within the usable clamping range. The indicated minimum and maximum workpiece height must be kept.



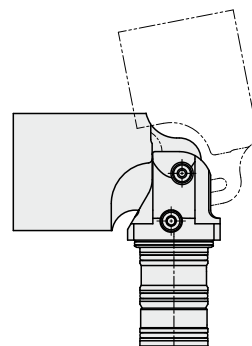
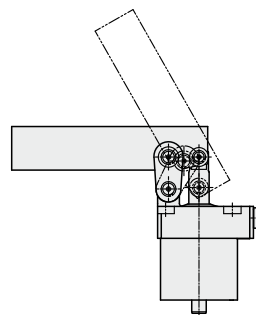
**Clamping lever**

**Longer and shorter**

When using longer clamping levers, the clamping force will be reduced. When using shorter clamping levers, the hydraulic pressure is to be reduced to avoid overload of the lever mechanism. To calculate the clamping forces and the admissible operating pressure, there are suitable diagrams and formula on the data sheets.




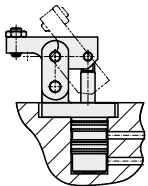
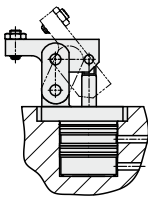
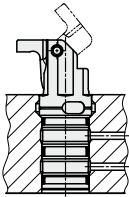
**Accessory: long clamping lever**

Long clamping levers are available for all hinge clamps and compact clamps as accessory or option. Clamping levers in the desired shape or length can be manufactured from these blanks.





## Program summary HINGE CLAMPS and CLAMPS

	Mini hinge clamps		
<b>Type</b>	<b>cartridge type 250 bar</b>	<b>cartridge type 70 bar</b>	<b>mini compact clamps cartridge type 200 bar</b>
			
<b>Data sheet</b>	<b>B 1.8252</b>	<b>B 1.8262</b>	<b>B 1.8271</b>
<b>Hydraulic connection</b>	drilled channels	drilled channels	drilled channels (1)
			
<b>Functioning</b>	double acting	double acting	double acting
<b>Special features</b>	– minimum dimensions – body partially recessible	– minimum dimensions – body partially recessible	– minimum dimensions (exterior diameter only 22 mm)
<b>Position monitoring</b>	–	–	–
<b>Number of sizes</b>	1	1	1
<b>Max. clamping force</b>	2.2 kN	2.3 kN	1.3 kN
<b>Clamping range</b>	±1.5 mm	±1.5 mm	5.0 mm
<b>Max. operating pressure</b>	250 bar	70 bar	200 bar
<b>Min. operating pressure</b>	10 bar	10 bar	20 bar
<b>Clamping lever variants</b>	with swivel contact bolt long clamping lever without clamping lever	with swivel contact bolt long clamping lever without clamping lever	short clamping lever
<b>Seals / wipers</b>	FKM	FKM	NBR / PUR
<b>Metallic wiper edge</b>	●	●	●
<b>Max. operating temperature</b>	150 °C	150 °C	80 °C
<b>Max. flow rate clamping</b>	15 cm <sup>3</sup> /s	15 cm <sup>3</sup> /s	5 cm <sup>3</sup> /s
<b>Clamping without side loads</b>	possible	possible	●
<b>Mounting position</b>	any	any	any

**Legend:**

- standard
- (1) Accessory: mounting body for pipe thread
- (2) 20 bar without position monitoring, 70 bar with clamping monitoring or unclamping monitoring
- (3) Adapt counterweight

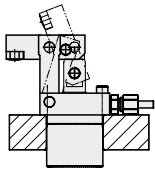
Hinge clamps

**flange type  
200 bar**



**B 1.825**

pipe thread



double acting

– interchangeable contact bolts

–

1

18 kN

6.0 mm

200 bar

10 bar

with contact bolt  
long clamping lever  
clamping lever cranked

NBR

–

80 °C

40 cm<sup>3</sup>/s

–

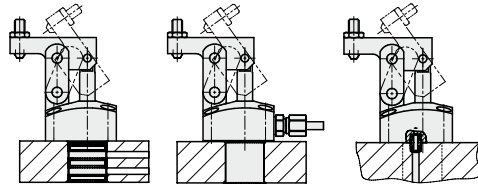
any

**cartridge type and  
flange type  
250 bar**



**B 1.8251**

pipe thread or  
drilled channels



double acting

– clamping possible without side loads  
– 4 sizes

Option: inductive or pneumatic position  
monitoring by extended piston rod

4

3.3 ... 21.5 kN

4.0 ... 9.0 mm

250 bar

10 bar

with swivel contact bolt  
long clamping lever  
without clamping lever

FKM

●

150 °C

15.7 ... 55 cm<sup>3</sup>/s

possible

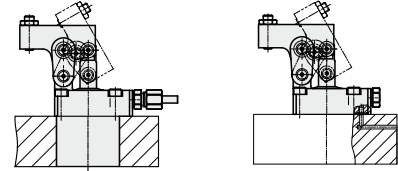
any

**flange type  
70 bar**



**B 1.8268**

pipe thread or  
drilled channels



double acting

– built-in flow control valve  
– clamping possible without side loads  
– 5 sizes  
– 3 clamping directions selectable

Option: inductive or pneumatic position  
monitoring by extended piston rod

5

2.3 ... 12.1 kN

2.1 ... 4.1 mm

70 bar

10 bar

with contact bolt  
long clamping lever  
without clamping lever

NBR / FKM





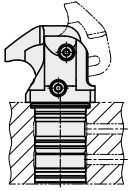
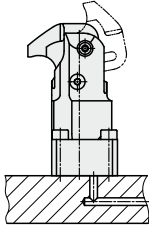
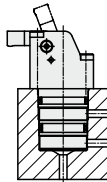
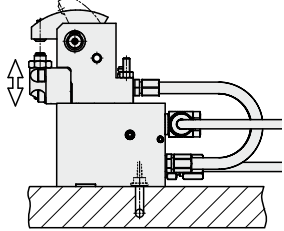
●

80 °C





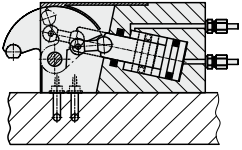
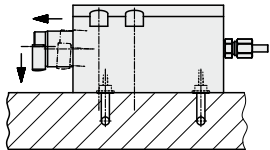
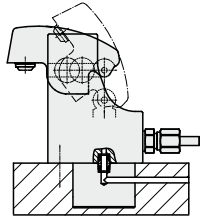
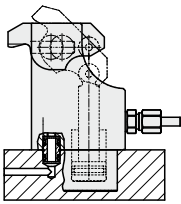
16 ... 150 cm<sup>3</sup>/s

possible

any

Compact clamps		Hinge clamps with flat clamping lever	Position flexible clamps
<b>cartridge type 250 bar</b>	<b>flange type 250 bar</b>	<b>cartridge type 250 bar</b>	<b>250 bar</b>
			
<b>B 1.827</b>	<b>B 1.828</b>	<b>B 1.829</b>	<b>B 1.733</b>
drilled channels (1)	drilled channels	drilled channels	pipe thread or drilled channels
			
double acting	double acting	single acting or double acting	double acting
– minimum dimensions – clamping possible without side loads	– minimum dimensions – clamping possible without side loads	– minimum dimensions – particularly flat clamping lever can be swivelled into small recesses	– clamping unit adapts itself position flexible to the height – workpiece support point adjustable
Option: pneumatic clamping monitoring or unclamping monitoring	Option: pneumatic clamping monitoring or unclamping monitoring	Double acting: pneumatic clamping monitoring or unclamping monitoring	Option: inductive or pneumatic control of the unclamping position and the end of the clamping stroke
4	4	4	1
2.5 ... 10.5 kN	2.5 ... 10.5 kN	2.5 ... 13.0 kN	7.5 kN
4.5 ... 8.0 mm	4.5 ... 8.0 mm	2.7 ... 5.1 mm	Pendulum range $\pm 4.0$ mm
250 bar	250 bar	250 bar	250 bar
20/70 bar (2)	20/70 bar (2)	20 bar	50 bar
short clamping lever long clamping lever (blank) without clamping lever	short clamping lever long clamping lever (blank) without clamping lever	short clamping lever long clamping lever	with swivel contact bolt
NBR / PUR	NBR / PUR	NBR / FKM	NBR
●	●	●	–
80 °C	80 °C	80 °C	80 °C
4 ... 25 cm <sup>3</sup> /s	4 ... 25 cm <sup>3</sup> /s	4 ... 40 cm <sup>3</sup> /s	15 cm <sup>3</sup> /s
●	●	●	possible
any	any	any	any (3)



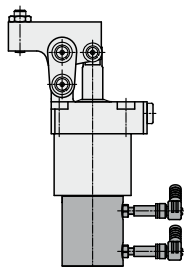
Flat clamps	Block clamps	Slide pivot clamps	
<b>500 bar</b>	<b>70 / 100 bar</b>	<b>500 bar</b>	<b>compact type 350 bar</b>
			
<b>B 1.8231</b>	<b>B 1.8233</b>	<b>B 1.8241</b>	<b>B 1.8242</b>
pipe thread or drilled channels	pipe thread or drilled channels	pipe thread or drilled channels	pipe thread or drilled channels
			
double acting	double acting	double acting	double acting
– high protection against swarf and welding spatter – clamping lever retracts completely	– versions with / without self-locking – clamping direction 0 to 360° adjustable	– high clamping force – compensation of side loads at the clamping point	– minimum dimensions – compensation of side loads at the clamping point
Accessory: inductive control of the unclamping position and the clamping position	on request	Accessory: inductive or pneumatic control of the clamping lever	Accessory: inductive or pneumatic control of the clamping lever
2	2	3	1
12.0 ... 20.5 kN	7.5 ... 31.0 kN	15.0 ... 50.0 kN	10.0 kN
9.0 ... 16.0 mm	6.0 ... 8.0 mm	7.0 ... 9.5 mm	5.5 mm
500 bar	70 / 100 bar	500 bar	350 bar
10 bar	20 / 30 bar	10 bar	10 bar
dome-head clamping lever with swivel ball	with interchangeable contact bolts	with swivel ball long clamping lever	dome-head clamping lever
NBR	NBR / FKM	NBR	NBR
–	–	–	●
80 °C	80 °C	80 °C	80 °C
10 ... 20 cm³/s	25 ... 100 cm³/s	25 ... 80 cm³/s	10 cm³/s
possible	–	possible	possible
any	any	any	any



## Accessory: position monitorings

Two series of the **hinge clamps** are optionally supplied with an extended piston rod (switch rod).

A pneumatic or inductive position monitoring can be fixed at the bottom of the housing.



Both versions have the following control functions:

### 1. Unclamped

Piston retracted and clamping lever in off-position.

### 2. Clamped

Piston extended and clamping lever in clamping position.

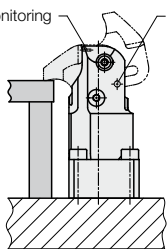
For each control function, a pneumatic line or an electrical line has to be provided at the clamping fixture.

The double-acting **hinge clamps with flat clamping lever** are supplied with bore hole for the pneumatic monitoring of the clamping lever as standard. The customer can decide for himself if he wants to use the two connections.

The **compact clamps** can optionally be supplied with bore holes for the pneumatic monitoring of the clamping lever.

For the cartridge type, either the clamping or the unclamping monitoring can be selected. The flange type can be supplied with both monitorings.

Clamping monitoring      Unclamping monitoring



### 1. Unclamped

The clamping lever is within the unclamping range, starting approx. 10° before the final position.

### 2. Clamped

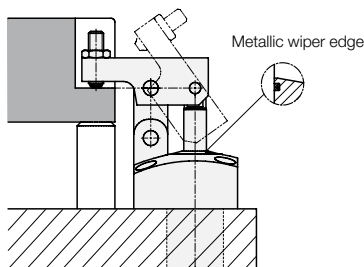
The clamping lever is within the usable clamping range and the workpiece is clamped with minimum clamping force.

For the last-mentioned function, a minimum pressure of 70 bar is required.

## Metallic wiper edge

The hinge clamps and the compact clamps are provided with a metallic wiper edge at the piston rod outlet. Thus, the subjacent FKM wiper is protected against hot swarf or high coolant pressure.

For dry machining and minimum quantity lubrication as well as in case of accumulation of very small swarf, the hinge clamps should be regularly cleaned and lubricated.



## Sealing materials

- NBR = Nitril-Butadien-Rubber  
Trade name e.g. Perbunan  
Operating temperature -30...+80 °C

- FKM = flour caoutchouc  
Trade name e.g. VITON®  
Operating temperature -20...+150 °C

## Maximum operating pressure

This pressure specification is valid for the use of the standard clamping lever.

The admissible operating pressure for other lever lengths can be determined with the clamping force diagrams on the data sheets.

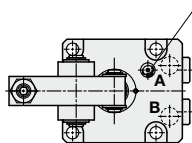
## Admissible flow rate

The catalogue specifications should not be exceeded to avoid overload and increased wear. A throttling of the flow rate has to be made in the oil supply line to the hinge clamp to rule out a possible pressure intensification.

## Note

The hinge clamps as per data sheet B 1.8268 have a built-in flow control valve that can be easily adjusted from above.

Flow control valve SW 1.5



## Leakage rate

Static under pressure, all clamping elements are leakage-free.

When extending the piston, the sturdy high-pressure seals let pass a little residual oil film. This increases the service life of the seals and guides.

## Bleeding

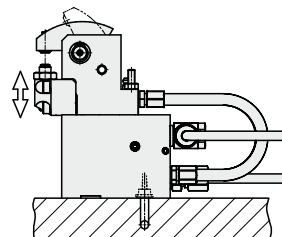
Air in the oil prolongs the clamping time considerably and leads to function troubles. Therefore, thorough bleeding has to be effected during start up.

## Clamps

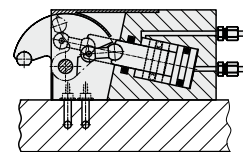
The 5 clamps in this program summary could, in the broadest sense, also be designed as hinge clamps despite of the significant difference in function and application.

The listing of the most important features would go beyond the scope of this short information. You will find a detailed description on the corresponding data sheets.

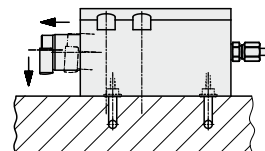
### Position flexible clamp → B1.733



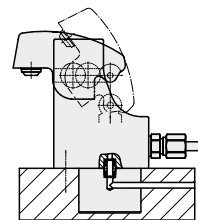
### Flat clamp → B1.8231



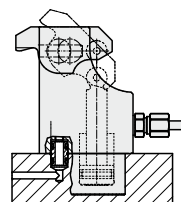
### Block clamp → B1.8233



### Slide pivot clamp → B1.8241 500 bar



### Slide pivot clamp → B1.8242 Compact design

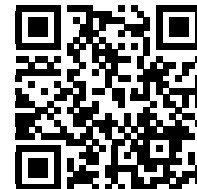




## Videos regarding function and application on YouTube

**Compact clamp B 1.827**  
with pneumatic clamping monitoring

<https://www.youtube.com/watch?v=Hxcp9ry3Pvo>



**Mini compact clamp B 1.8271**  
with minimum dimensions  
and a unique fixing principle

<https://www.youtube.com/watch?v=sDu1iO9aw18>



**Position flexible clamp B 1.733**  
for supporting and clamping  
of unstable workpiece sections

<https://www.youtube.com/watch?v=GZTQydVFjZs>



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