



# Operating instructions

including installation and assembly instructions

for incomplete machines as per Machinery Directive 2006/42/EC

## Clamping bar

- Typ.: 2095-
- Typ.: 8.2096.xxxx
- Typ : 8.2097.xxxx
- special design



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**In order to ensure safe operation according to the intended purpose, please read the operating manual before installation and before putting the clamp into operation!**

## 1 Safety information

### 1.1 General

The safety of Hilma-Römheld clamping bars has been thoroughly checked. They are designed for use as specified in the technical data. If the technical data is not observed, there may be a danger to the operator and proper functioning of the machine may be put at risk. Unauthorised modification or alteration of Hilma-Römheld clamping bars is prohibited for reasons of safety. If this instruction is not observed, our guarantee will be invalid.

### 1.2 Field of application

Hilma-Römheld clamping bars are designed for a large number of clamping applications. Clamping bars are particularly suited for the clamping of dies on presses when standardised dies with standardised clamping edges are used.

### 1.3 Operating characteristics

The load values specified for Hilma Römheld Clamping bars must not be exceeded (see data sheets in the appendix).

**Attention: Overloading the Clamping bars may lead to failure of the elements or to their destruction.**

### 1.4 Temperatures

The maximum operating temperature for the standard design is 100 °C. In case of higher temperatures special designs with high-temperature sealing must be used (special designs for max. temperatures of 250°C)

## 1.5 Important safety information

- Depending on the installation, there may be pinch hazard between the hollow piston cylinder and the clamping point
- Keep hands and tools away from the clamping range when operating the hollow piston cylinders.

### Attention:

Before putting the clamping bar into operation, the operator must be fully trained. Young people less than 16 years old are not allowed to operate the clamps. Staff aged over 16 years are allowed to operate the clamps under supervision as part of their apprenticeship. The operating instructions must be readily accessible. The operator must inform third parties of any danger in the working area.

## 1.6 Declaration

Hilma- Römheld Clampin bars have been developed, designed and manufactured in accordance with the EC Directive 'Machinery' 2006/42/EC. The complete text of the manufacturer's declaration will be made available on request.

## 2 Design und function

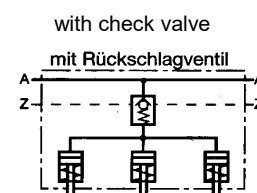
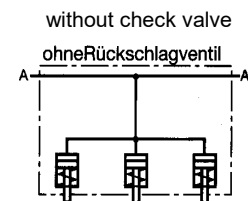
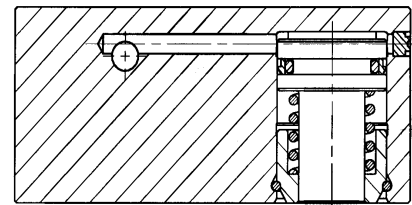
### 2.1 Clamping bars type 2095- and 2096-

Clamping bars of the 2095- and the 2096- series are single-acting with spring return, i.e. hydraulic pressure is applied to the pistons for clamping. For unclamping, the pistons are moved back to their initial positions using integral pull-back springs. The return force is designed to overcome a dynamic pressure of 2 bars at least.

The spring chamber is ventilated through a drill hole with a filter plug. Application conditions such as much cooling liquid, cooling lubricants or other liquids may call for measures in order to ensure that the clamping bar does not fetch dirt or liquid through the ventilation holes.

If the clamping bar is equipped with an integral pilot-controlled check valve, such check valve must be pressurized for unclamping (Z port).

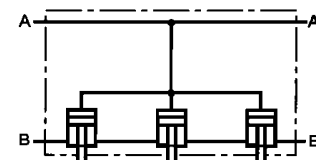
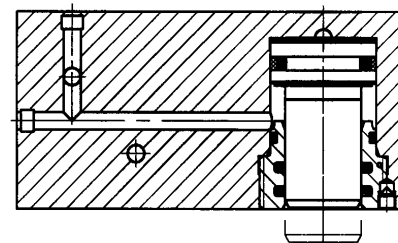
The stroke limitation is fully usable for all types of clamping bar.



### 2.2 Clamping bar, double-acting (special design)

For clamping, pressure is applied to port A (the piston extends). For unclamping, pressure is applied to port B (piston retracts).

The use of double-acting clamping bars is recommended for automated processes, short cycles, long hydraulic lines etc., in order to enable shorter resetting times than are achieved by way of spring return.





## 3 Technical data, Main dimensions

### Clamping bars

Clamping force	depending on type 35 -116 kN
Total stroke	depending on type 6 - 8 mm
Operating pressure	400 bar
Clamping stroke	depending on clamping edge design
Max. temperature (standard)	100°C
Max. temperature (special)	250°C

The technical data and the dimensions of the different types are quoted in the attached data sheets.

## 4 Installation, connection and putting into operation

**If the incomplete machine 'Clamping bar' is installed, the following minimum conditions must be complied with, in order to ensure correct assembly with other components to form a complete machine without endangering personal health and safety.**

### 4.1 Storage and transport

During transportation, clamping elements must be protected against mechanical damage. For medium term storage, they should be kept in a closed dry space. Even for short-time storage in the open air they should be protected against harmful environmental influences .

### 4.2 Installation

- Installation work must only be carried out when the system is in an unpressurised condition.
- Prepare the bore pattern according to the drawing / data sheet in the catalogue.

### 4.3 Hydraulic installation

The hydraulic pipework on the machine side must be of sufficient size (8x2 DIN 2391-St35 NBK or larger). It must be installed in accordance with the specifications (DIN EN 982) and must conform with up-to-date practice for high-pressure hydraulics. Pipes should be as short as possible. For single acting cylinders with a spring return, the maximum length should be 5 m, for double acting cylinders longer pipes may be used.

Pipe bends should have a large radius. Neat installation is essential for trouble-free operation of the system. Make sure that the pipe ends are free from burrs and that pipes, high-pressure hoses and screw fittings are cleaned and blown through. Protective plugs should only be removed immediately before connecting the hydraulic system.

When using hoses, keep the minimum bending radius.

### 4.4 Putting into operation

**Read the operating manual before putting the cylinders into operation for the first time!**

- Provide the pressure generator with a pressure relief valve suitable for the operating pressure.
- Secure the working area.
- Only use clean, fresh oil.
- Bleed the complete system at the highest point or directly at the port of the clamping element at low pressure (20bar ), in order to eliminate any bubbles.
- Apply pressure to the element and clamp and unclamp it several times, check by visual inspection.
- Check the hydraulic system for tightness by visual inspection of the pipes and hoses, screw fittings and clamping elements while pressure is applied.



#### **ATTENTION:**

During clamping and unclamping, keep your hands and tools away from the clamping zone  
**RISK OF INJURY!**



## Controls:

In the case of *all clamping elements*, the time provided in the control sequence between the different movements must be sufficiently long ( $t > 3s$ ), in order to allow all functions to run smoothly.

Depending on the design of the hydraulic system of the machine (pipe cross sections, hose lengths, pump position and delivery, etc.) the time may vary. It may be necessary to increase or decrease the quoted values, depending on the system parameters.

Due to friction in pipes, screw fittings, valves etc. a hydraulic pressure of between 1 and 2 bar is required. The spring restoration force of single-acting cylinders is designed so that a dynamic pressure of 2 bar is overcome.

## 5 Trouble shooting



The Clamping bar has left our premises in perfect condition. All functions have been tested, and necessary adjustments have been made.

If any malfunction should occur even though the information contained in chapter 4.0 (Installation and connection) has been duly observed, check once again the hydraulic installation and the software. If no cause can be found for the malfunction, please contact the manufacturer:

Failure	Possible cause	Remedial action
<b>Clamp does not clamp or unclamp</b>	-Hydraulic supply interrupted / incorrect. -Hydraulic system not bled. -Working pressure incorrect. -Pump unit does not work or is not in operation.	Check hydraulic pipes and hose connections up to the pump unit. Check for correct connection (clamping/unclamping). Bleed hydraulic system. Correct working pressure.
<b>During unclamping, piston does not move to the initial position</b>	- Incorrect installation of hydraulic system Cross sections of hydraulic pipes and hoses too small, dynamic pressure in pipes and hoses too high	Use pipes and hoses with larger diameter. Use hydraulic oils with less viscosity

## 6 Maintenance and repair

Under normal conditions, Hilma clamping bars do not need special maintenance. However, a visual check of the hollow piston cylinders and any hoses used should be carried out once a week.

**In the case of frequent clamping cycles or in a dirty environment along with high temperatures, the checking frequency should be increased.**

Hydraulic valves are very sensitive to dirt. Make sure that no impurities get into the hydraulic fluid. We recommend that the oil is changed once a year.

When carrying out routine maintenance work on the press:

- inspect the hydraulic system
- check the hydraulic system for tightness.

**Note:** The hydraulic system is designed to **DIN EN 982** "Safety-related requirements on hydraulic systems and their components".

For the list of spare parts and installation drawings, please refer to chapter 7 (Technical appendix).

After replacing a clamping element, move the new element several times in order to bleed the system through the pump unit (the same applies if hydraulic connections have been disconnected).

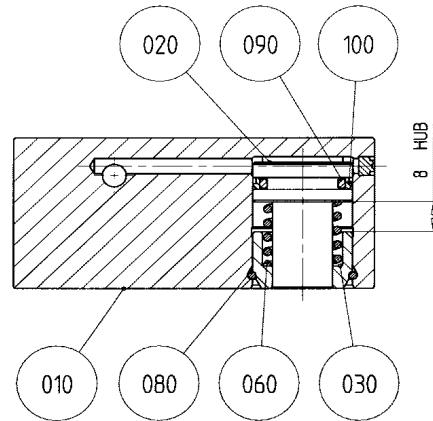
## 7 Technical appendix, spare parts

For clamping bars of the 2095 series, the guide sleeve of the piston is firmly pressed on. The bar can therefore not be disassembled.

When ordering spares for clamping bars of the 2096- series, please quote the serial no. engraved on the rear side of the clamping bar, the item no. and the designation of the spare part as quoted in the spare parts list.

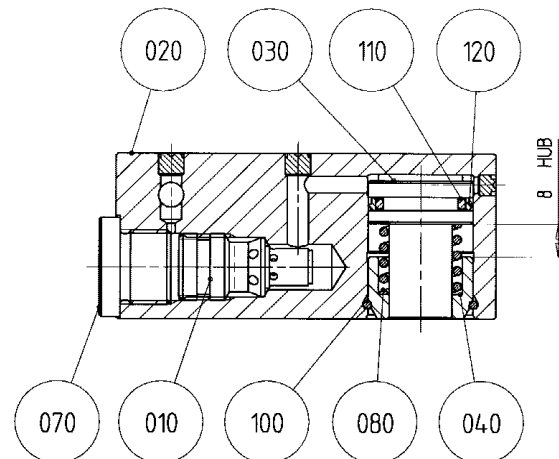
### Spare parts list clamping bar 8.2096.- without check valve

Pos	Designation
010	Clamping bar housing
020	Piston
030	Sleeve
060	Pressure spring
080	Circlip
090	O-ring
100	Stepseal A



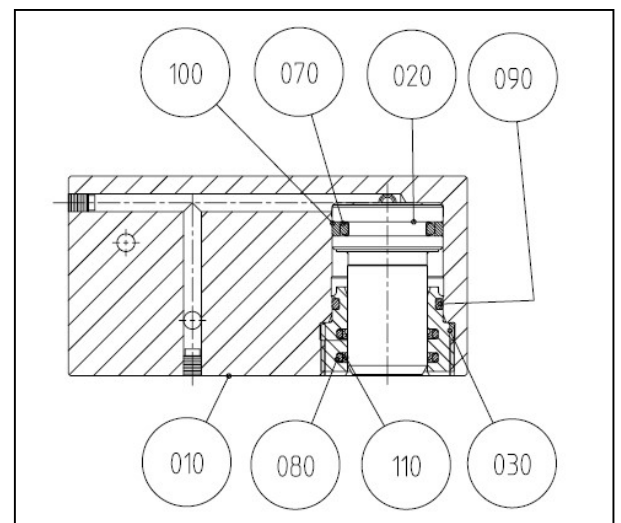
### Spare parts list clamping bar 8.2096.- with check valve

Pos	Designation
010	Check valve
020	Clamping bar housing
030	Piston
060	Sleeve
070	Plug
090	Pressure spring
100	circlip
110	O-Ring
120	Stepseal- A



### Spare parts list clamping bar 2096-double acting

Pos	Designation
010	Clamping bar housing
020	Piston
030	Sleeve
060	O-Ring
070	O-Ring
090	O-Ring
100	Stepseal A
110	Stepseal I





## Declaration of incorporation

as per

**Machinery Directive EC-RL 2006/42/EC  
dated June 9, 2006.**

We,

**Hilma- Römheld  
Schützenstrasse 74  
57271 Hilchenbach,**

declare, that the incomplete machine and its variants:

### **Clamping bar**

**Part no.            2095-xxx  
                         8.2096.xxxx  
                         8.2097.xxxx**

as supplied by us has been specifically designed for incorporation into a machine, taking full account of DIN EN ISO 13857. The documentation has been prepared in conformity with appendix VII B. If required, the national authority may receive the documentation as a hard copy by post or by e-mail as a PDF format file. The machine into which the parts are to be integrated must only be put into operation after the conformity of the machine with the above EC directive has been demonstrated.

The design of our products is in accordance with DIN EN ISO 4413 and EN 60204-1.

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Hilchenbach August 19, 2010  
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