ROEMHELD
HILMA ▪ STARK

Operating instructions

including installation and assembly instructions
for incomplete machines as per Machinery Directive 2006/42/EC

Hollow piston cylinder

Typ.: 2130-

Typ.: 1300-

Typ.: 1320-

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Please read the operating manual before installing the hollow piston cylinders and putting them into operation for the first time!

1 Safety information

1.1 General

The safety of Hilma-Römheld hollow piston cylinders 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 hollow piston cylinders is prohibited for reasons of safety. If this instruction is not observed, our guarantee will be invalid.

1.2 Field of application

Hilma-Römheld hollow piston cylinders are designed for a large number of clamping applications, in connection with screw or tie rods or T-bolt supports. Hollow piston cylinders type 2130 are particularly suited for the clamping of dies on presses when standardised dies with clamping slots are used.

1.3 Operating characteristics

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

Attention: Overloading the hollow piston cylinders 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.

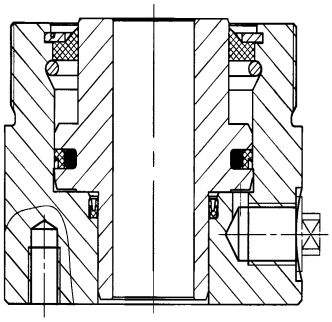
Attention:

Before putting the hollow piston cylinders 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 are

2 Design and function

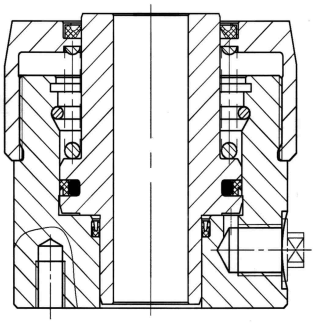
2.1 Type 1300- hollow piston cylinder

Type 1300- hollow piston cylinder is single-acting without spring return, i.e. for clamping, hydraulic pressure is applied to the piston. For unclamping, the piston must be returned into its initial position by means of an external spring element or by the dead weight of the attached parts. The restoring force should be such that a dynamic pressure of min. 2 bar in the hydraulic pipes is overcome. The stroke limits of the cylinder can be fully used.



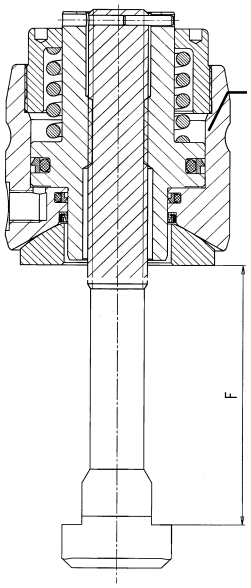
2.2 Type 1320- hollow piston cylinder

Type 1320- hollow piston cylinder is single-acting with spring return, i.e. for clamping hydraulic pressure is applied to the piston. For unclamping, the piston is returned into its initial position by the integral pressure spring. The stroke limits of the cylinder can be fully used.



2.3 Type 2130- hollow piston cylinder

Type 2130- hollow piston cylinder is single-acting with spring return, i.e. for clamping hydraulic pressure is applied to the piston. For unclamping, the piston is returned into its initial position by means of the integral pressure spring. The spherical washer permits precise power transmission in the case of uneven clamping edges. The stroke limits of the cylinder can be fully used.



2.3.1 Adjusting the clamping range

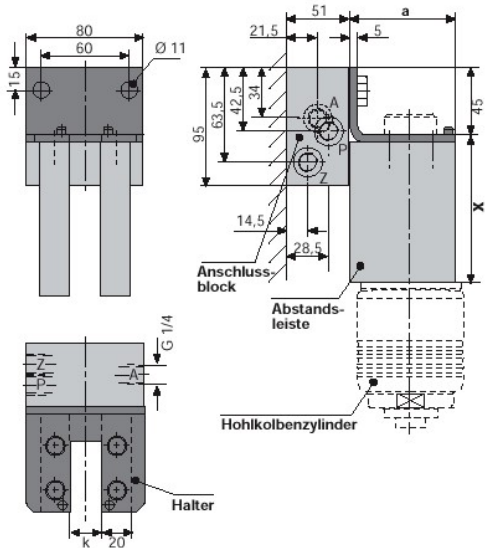
Hilma hollow piston cylinders type 2130 are very suitable for clamping dies on presses when using standardised dies provided with clamping slots and with standardised clamping edge heights. Hollow piston cylinders with T-bolt support are works-adjusted to suit the functional dimension 'F' and secured by a pin.

Web height of the T-slot
F = +clamping edge height
+ insertion tolerance (6mm)

If the cylinder is to be adapted for various clamping edge heights, the safety pin can be removed. Make sure that the insertion tolerance is always less than the max. cylinder stroke, as otherwise no clamping force will build up.

2.3.2 Holder for hollow piston cylinders

It is recommended that hollow piston cylinders which are not required for clamping small dies are clamped in holders which are offered as accessories.
For more details, please see attached data sheet.



3 Technical data, Main dimensions

Hollow piston cylinders

Clamping force	depending on type 35 - 137 kN
Total stroke	depending on type 12 - 15 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 'hollow piston cylinder' 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 ISO 4413) 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 hollow piston cylinder 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
Clamp does not clamp or unclamp	-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.
During unclamping, piston does not move to the initial position	- 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, hollow piston cylinders 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 ISO 4413** "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).

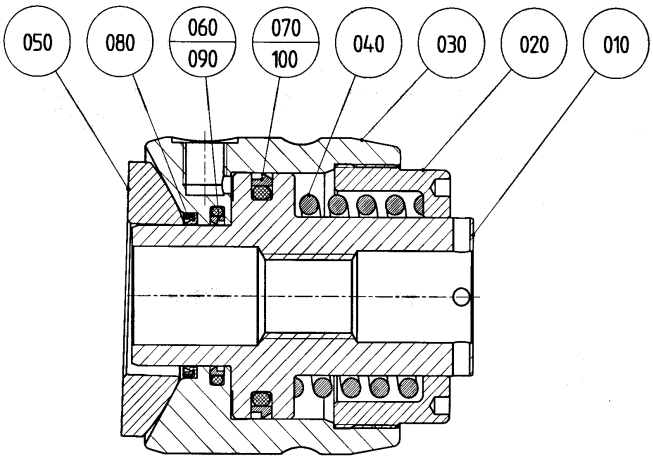
After replacing a clamping element, move the new element several times in order to bleed the system through the pump unit (the same applies if hydraulic connections have been disconnected).

For putting the system into operation, see chapter 4.0 (Installation, connection and putting into operation).

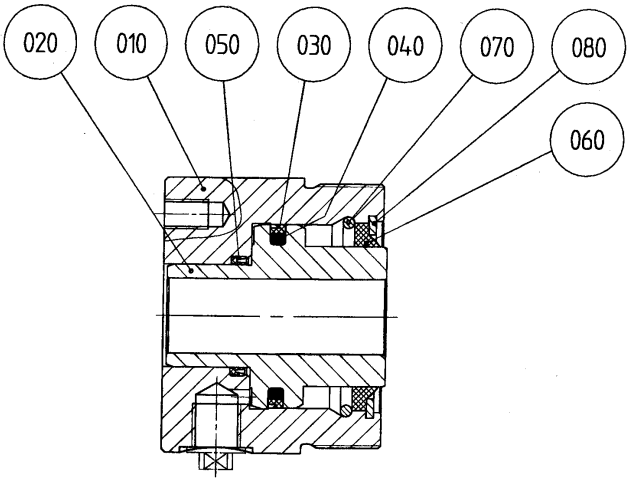
7 Technical appendix, list of spare parts

When ordering spare parts, please indicate the type number engraved on the cylinder, the number and the designation of the component which are specified in the spare parts lists.

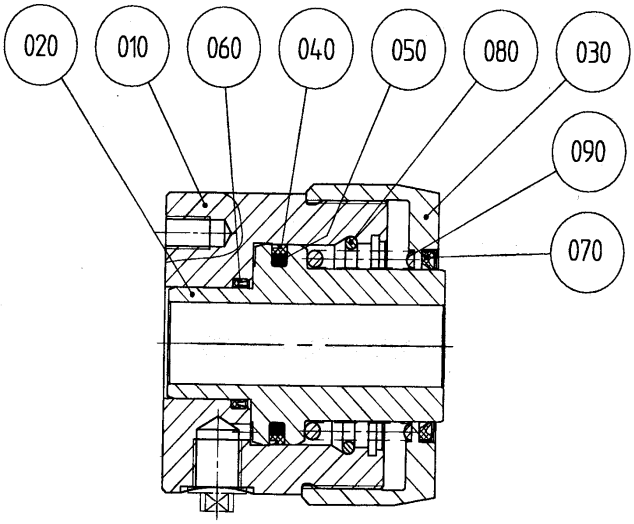
Spare parts list Hollow piston cylinder type 2130-	
Item no.	Designation
010	Piston
020	Lid
030	Cylinder
040	Pressure spring
050	Spherical washer
060	O-ring
070	O-ring
080	Packing ring
090	Stepseal packing ring I
100	Stepseal packing ring A
110	



Spare parts list Hollow piston cylinder type 1300-	
Item no.	Designation
010	Cylinder
020	Piston
030	Stepseal packing ring A
040	O-ring
050	Packing ring
060	Scraper
070	Retainer ring
080	Circlip
090	
100	
110	



Spare parts list Hollow piston cylinder type 1320-	
Item no.	Designation
010	Cylinder
020	Piston
030	Lid
040	Stepseal packing ring A
050	O-ring
060	Packing ring
070	Scraper
080	Retainer ring
090	Pressure spring



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:

Hollow piston cylinder
Part no.
1300-xxx
1320-xxxx
2130-xxxx

the following essentials fulfill requirements from Appendix I: 1.1.2, 1.1.3, 1.1.5, 1.1.6, 1.2.6, 1.3.2, 1.3.4, 1.3.6, 1.3.7, 1.5.3, 1.5. 9, 1.7.1, 1.7.3, 1.7.4.1, 1.7.4.2, 1.7.4.3. of the above-mentioned directive.
We hereby declare that the incomplete machine referred to in Article 2g is only intended for installation in assembly with another machine or equipment. The preparation of the documents was carried out in accordance with Appendix VII B. Commissioning is prohibited until it has been determined that the machine in which the incomplete machine is to be installed complies with the provisions of the above-mentioned guidelines.
With this declaration of incorporation, we undertake, upon justified request, to transmit the special technical documents of the incomplete machine in the form of paper or electronically to the responsible national authorities.
Applied harmonized standards:
DIN EN ISO 4413, EN ISO 12100

Responsible for the document:
Thomas Willingshofer
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Hilchenbach January 9, 2020
H.- J. Molka
Managing Director