ROEMHELD
HILMA ▪ STARK

Operating Manual

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

Pivot and pull clamp

Type: 8.2185.xxxx
8.2186.xxxx

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In order to ensure safe operation for the intended purpose, please read the operating manual before installation and commissioning

1 Safety information

1.1 General

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

1.2 Field of application

Hilma-Römheld pivot and pull sink clamping elements clamp, using a tie rod, especially dies in die casting machines or in other presses. The length of the tie rod must be determined as a function of the clamping edge height.

1.3 Operating parameters

Hilma-Römheld pivot and pull clamps must not be exposed to higher loads than those specified (see catalogue product group 2).

Attention: Overloading may result in failure / destruction of the pivot and pull clamp.

1.4 Temperatures

The maximum operating temperature for the standard version is 85 °C. Upon request, temperatures of up to 120 °C are possible using sensors.
Please note: At temperatures above 120 °C the use of standard sensors for position control of the clamping element is no longer possible.

1.5 Safety information

- The pivoting range of the clamping element must be unimpeded, as otherwise the element cannot reach the clamping position. Faulty clamping and thus damage to the element would be the result.
- For clamping, the tie bolt must be in a position which is vertical to the clamping point in order to ensure that the clamping and operating forces are appropriately transmitted.
- Skew clamping will lead to partial overload of the clamping point and the clamping element, and plastic material deformation will result.
- In the sense of the Machine directive 2006/42/EC and for general safety, hydraulic pressure must be maintained.
- During clamping, staying in the danger zone is prohibited as there is a danger of some part of the body being crushed !
- Specified operating pressures and temperatures must not be exceeded.

Before putting the elements into operation, the operator must be fully trained.
Young people under 16 years old must not be allowed to operate the clamps. Staff over 16 years old are allowed to operate the elment 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 pivot and pull clamps have been developed, designed and manufactured in accordance with the EC Directive 'Machinery' 2006/42/EC.

2 Design and function

2.1 Design

The pivot and pull clamp consists of various subassemblies:

1. Cylinder, double acting
2. Housing which accommodates the swing mechanism
3. Position control
4. Tie rod (accessory)

2.2 Functional description

2.2.1 Moving into the clamping position

Pressure is applied to port A of the pivot and pull clamp, the cylinder moves the tie rod by means of the pivoting mechanism into a position vertical to the clamping point, the park position signal goes out.
The tie rod moves into the clamping position, clamping force is built up and the clamping position signal is activated.
If the tie rod moves beyond the clamping position or in the event of ineffective clamping, the signal of the proximity switch for the clamping position goes out.

2.2.2 Element in the initial position

Pressure is applied to port B, the tie rod is released and moves away from the clamping point.
The clamping position signal goes out.
By means of the pressure cylinder and the pivot mechanism, the cylinder moves the tie rod into the outside initial position, the clamping point is free, and the park position signal lights up.

3 Technical data, main dimensions

Pivot and pull clamp 8.2185/ 8.2186

Clamping force	8.2185/	8.2186	100 kN	164 kN
Total stroke			24 mm	26 mm
Operating pressure			400 bar	
Pivot + clamping stroke			10+10 mm	
Max. temperature (standard)			85°C	

Hydraulic interface

Port A	Moving into the clamping position - clamping
Port B	Unclamping, moving into the initial position

For technical data and dimensions, please refer to the data sheets and drawings attached.

4 Installation instructions, connection and commissioning

If the incomplete machine 'pivot and pull clamping element' 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 Installation

- Installation work must only be carried out with the system being unpressurized.
- Hole pattern as per drawing and catalogue sheet, respectively,
- Position the pivot and pull clamp and tighten the screws by applying the tightening torque as per DIN.

4.2 Hydraulic installation

The hydraulic pipework on the machine side must be of sufficient size (8x1; 5 DIN 2391-St35 NBK or larger) and must be installed in accordance with the specifications (DIN EN ISO 4413) and must also conform to up-to-date practice for high-pressure hydraulics. Pipes should be as short as possible; 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.
In the case of discharge rates exceeding 8l/ min., it is recommended that throttle valves are installed in the A and B lines.

4.3 Commissioning

Read the operating manual before commissioning!

- Fit the pressure generator with a pressure control valve adapted to the operating pressure.
- Secure the working area.
- Only use clean, new oil.
- Bleed the complete system with the pump running at low pressure (=20 bar) at the highest point until the oil emerging is free from bubbles
- Apply pressure several times and operate all elements several times. Carry out a visual check.
- Check the hydraulic installation for tightness. Visually check all pressurized pipes, hoses, screw fittings and clamping elements.
- Secure the tie rod of the element using a setscrew after it has been adjusted to suit the clamping position. To do this, remove the screw plug in the lower left area. Spot-drill the tie rod and secure it at the tie rod accommodation. Retighten the screw plug.

ATTENTION: When clamping and unclamping operations are carried out, keep your hands well away from the moving range of the pivot and pull elements. **DANGER OF INJURY!**

Controls:

For *all elements* a sufficient period of time t > 3s must be provided for ensuring the functional sequence. Depending on the design of the hydraulic system (pipe cross sections, hose lengths, position and delivery rate of the power unit etc.) the required time may vary. It may be necessary to increase or reduce the indicated values.

5 Trouble shooting

The clamping elements have 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 conditions stipulated in chapter 4.0 (Installation and commissioning) have been duly observed, please try to establish the cause using the table below.

Failure	Cause	Remedial action
The clamping element does not clamp nor unclamp	Hydraulic supply interrupted / not correct. Hydraulic system not bled, adjusted operating pressure incorrect. Power unit does not function correctly / is not active.	Check hydraulic lines and hose connections up to the power unit. Check for correct connection (clamping / unclamping). Bleed hydraulic system. Readjust the operating pressure.
The pivot and pull element does not move into the clamping position	Pivoting mechanism defective.	Check, replace spring if necessary, grease elements.
Clamping force is not built up	Hydraulic pressure too low.	Check and adjust pressure.
Proximity switches do not give a signal	Proximity switches have become loose or defective	Readjust or replace proximity switches. For an easy adjustment of the proximity switches, place the element into the corresponding position.

6 Maintenance and repair

Under normal conditions, pivot and pull clamps do not need special maintenance. However, a visual check of the clamps should be carried out once a week.

Hydraulic valves are sensitive to dirt. No impurities must get into the hydraulic oil. It is recommended that the oil be changed once a year.
When carrying out routine maintenance work on the press:
- visually check the electrical connections (plug, cable) for damage
- check the hydraulic system for tightness,

Note: Design of the hydraulic system as per **DIN EN ISO 4413 '**Safety requirements for fluid power systems and their components'.

For spares and installation sketches, see chapter 7 (Technical appendix).

After changing a clamping element, it must be clamped and unclamped several times, in order to ensure bleeding through the power unit (this also applies if hydraulic connections have been disconnected).

For commissioning, see chapter 4.0 (Installation und commissioning)

7 Technical appendix, spare parts

When ordering spare parts, please indicate the number engraved on the pivot and pull clamp, e.g.
8.2185.1000 and the position number as per drawing

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:

pivot and pull clamp
type 8.2185.xxxx
8.2186.xxxx

as supplied by us has been specifically designed for incorporation into a machine, taking full account of DIN EN ISO 12100 and 13857 294. 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
H.- J. Molka
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