Operating Manual

including installation and assembly instructions

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

Hydraulic clamping nut

Types: 8.2273.xxxx
8.2274.xxxx
8.2275.xxxx
8.2276.xxxx
8.2277.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 hydraulic clamping nuts 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 hydraulic clamping nuts is prohibited for reasons of safety. If this instruction is not observed, our guarantee will be invalid.

1.2 Field of application

Hilma-Römheld hydraulic clamping nuts are intended for use on presses or similar machines or devices.

1.3 Operating parameters

Hilma-Römheld hydraulic clamping nuts must not be exposed to higher loads than those specified (see catalogue product group 6).

Attention: Overloading may result in failure / destruction of the hydraulic clamping nut.
If clamping elements fail, persons may be put at risk.

1.4 Temperatures

The maximum operating temperature for the standard version is 100 °C. In the case of higher temperatures, special designs must be used.

Temperature variations of more than+/- 20°C in relation to the nominal value are not permissible.

1.5 Important safety information

- Before applying clamping force, the clamping nut must be carefully placed into the clamping position, use a sickle spanner if necessary. Attention: there is a risk of crushing.
- If the full stroke of 2 mm is used, no clamping pressure is built up at the clamping point.
- The tie rod 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. Plastic material deformation will be the result.
- Do not exceed the nominal clamping force (take account of the pull-back forces).
- Observe the tightening torque for achieving the clamping force as per table.
- Temperature fluctuations of more than +/- 20°C in relation to the nominal value are not permissible
- In the case of an extended clamping period, the clamping force must be checked once a week.

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 consoles 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.

2 Design and function

2.1 Design

The hydraulic clamping nut consists of a housing with an annular piston and one or two rotary pistons for building up the clamping force. The transmission medium is hydraulic oil.
The model which has clamping force indication is provided with a pin on the upper side, which projects by 2.5 mm when there is nominal clamping force.

2.2 Functional description

Insert the hydraulic clamping nut into the T-slot using a T-bolt as per DIN 787. Turn the hydraulic clamping nut to move it towards the clamping point, apply preload using a sickle spanner if necessary. Adjust the torque wrench as shown on the diagram.
When using the model with clamping force indication, the piston should be turned until the pin projects by 2.5 mm The projecting pin can be clearly seen.

Attention: When the stroke is fully used, the rotary pistons will reach the internal stop, and no clamping force will be built up at the clamping point. Hydraulic clamping nuts should always be preloaded either manually or by using a sickle wrench!

3 Technical data, main dimensions

Hydraulic clamping nut

Clamping force / at tightening torque Type 2273	20 kN/ --- Nm
Clamping force / at tightening torque Type 2274	40 kN/ --- Nm
Clamping force / at tightening torque Type 2275	60 kN/ 7,5 Nm
Clamping force / at tightening torque Type 2276	100 kN/ 30 Nm
Clamping force / at tightening torque Type 2277	150 kN/ 40 Nm
Max. stroke	2 mm
Perm. temperature deviation	+/- 20°C

4 Installation instrucions, 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 Storage and transport

During transport, clamping elements must be protected against mechanical damage. They should be stored in closed, dry rooms. Even in the event of short-term storage in the open air, they must be protected against harmful environmental influences.

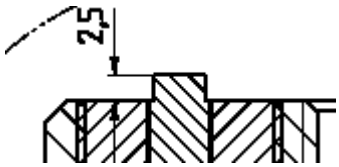
4.2 Commissioning

Read the operating manual before commissioning.

- Check the hydraulic clamping nut for any oil leakage.
- Screw in the tie rod, observe the minimum screw-in depth (in the clamping position, the tie rod must project over the clamping element by at least 1 mm).
- Place the element into the clamping position and preload it either manually or by using a sickle wrench,
- Build up the clamping force via the rotary pistons, using the pre-adjusted torque wrench, or with a commercially available Allen key for models with clamping force indication

ACHTUNG: The use of an impact wrench to screw the rotary piston will destroy the element and should be avoided as much as possible!

Attention: If the rotary pistons move against the inner stop, no clamping force will be built up!
Observe the permissible temperature fluctuations.
The use of pipes to increase the leverage on the Allen key is not allowed.



The magnitude of the clamping force is shown by a pin. When the pin projects by 2.5 mm, the clamping force is reached.

Attention: The hydraulic clamping nut must be in a position which is vertical to the clamping point and must be preloaded either manually or by using a sickle wrench before applying the clamping force.

ATTENTION: Do only hold the hydraulic clamping nut on its outside when placing it into the clamping position. **DANGER OF CRUSHING!**

5 Trouble shooting

The hydraulic clamping nuts 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
No clamping force is built up	- The hydraulic clamping nut has not been preloaded manually or by using a sickle wrench, the rotary pistons move up to the inner stop without building up pressure, - the required clamping force is not reached -due to leakage, there is a loss of hydraulic fluid, -sealing defect due to excessive operating force - sealing defect due to high temperature variations	-Move the hydraulic clamping nut into the clamping position, then build up clamping force using the torque wrench. -The torque adjusted on the torque wrench is incorrect. -Service by Hilma, -Service by Hilma, -Service by Hilma.

6 Maintenance and repair

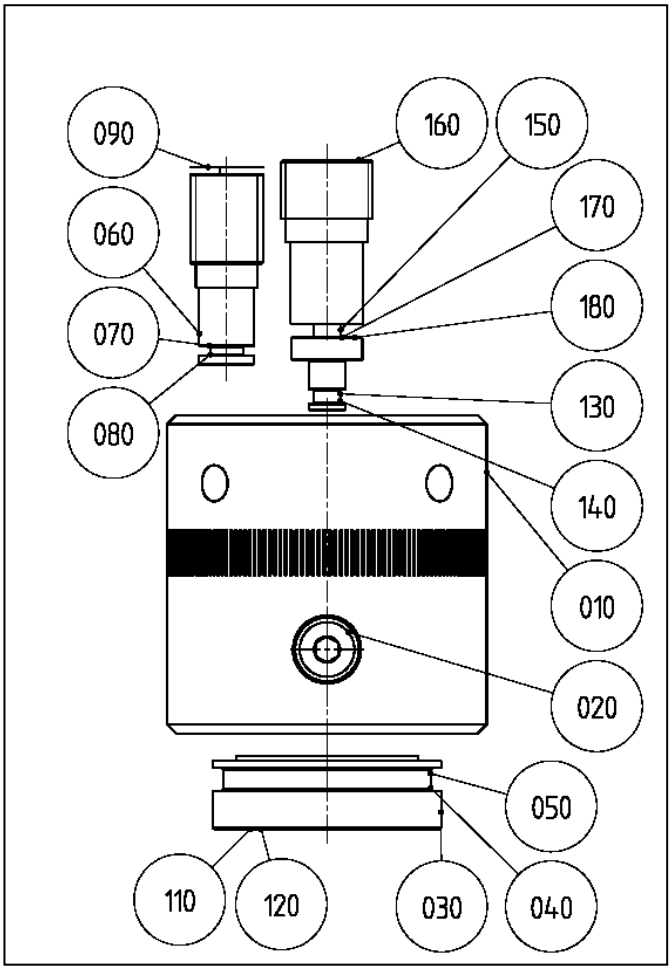
Under normal conditions, hydraulic clamping nuts do not need special maintenance. However, it is recommended to carryout a visual check before each clamping operation to detect damage or leakage. To avoid significant dirt accumulation, the hydraulic clamping nut should be cleaned at regular intervals.
In order to avoid increasing the tightening torque, the thread of the screw-in pistons must be greased every four weeks.

For commissioning, see chapter 4.0 (Installation und commissioning)

7 Technical appendix, spare parts

8.2273.0002

0010	520101402	CYLINDER
0020	179840017	SCREW M 4X 6
0030	510101780	PISTON RING
0040	196141040	BACKRING
0050	195000029	O-RING
0060	510101781	PISTON TURN
0070	3001180	TURC-GLYD
0080	195000215	O-RING
0090	179930012	SNAPRING
0100	195000180	O-RING
0110	196140019	BACKRING
0120	510130800	BOLT
0140	196141082	BACKRING
0150	504930097	BUSHING
0160	120930170	CUP SPRING
0170	109880089	SHIM RING
0180	109880090	SHIM RING
0190	196080006	USIT-RING



8.2274.0002

0010	520101398	CYLINDER
0020	179840005	SCREW M 5X 8
0030	510101768	PISTON RING
0040	196141069	BACKRING
0050	195000108	O-RING
0060	510101769	PISTON TURN
0070	3001180	TURC-GLYD-R.
0080	195000215	O-RING
0090	179930012	SNAPRING
0100	195000185	O-RING
0110	3000639	BACKRING
0120	510130795	BOLT
0140	196141082	BACKRING
0150	504930096	BUSHING
0160	120930010	CUP SPRING
0170	109880086	SHIM RING
0180	109880085	SHIM RING
0190	196080028	USIT-RING

8.2275.0001/ 0002

0010	520101176	CYLINDER
0020	109081008	VSTI G1/8-ED
	up to 06/ 2008	
	100850047	Screw M5 x 8
	as from 07/ 2008	
0030	510101382	PISTON RING
0040	3000605	BACKRING
0050	3000375	O-RING
0060	510101383	PISTON TURN
0070	196020011	TURC-GLYD-R.
0080	195000006	O-RING
0090	179930016	SNAPRING
0100	195000105	O-RING
0110	196141013	BACKRING
0120	510130501	BOLT
0130	195030169	O-RING
0140	196140148	BACKRING
0150	504930068	BUSHING
0160	120930155	CUP SPRING
0170	109880035	SHIM RING
0180	109880036	SHIM RING

8.2276.0001/ 0002

0010	520101154	CYLINDER
0020	109081008	VSTI G1/8-ED
	up to 06/ 2008	
	109120057	Screw M6 x 10
	as from 07/ 2008	
0030	510101360	PISTON RING
0040	3001138	BACKRING
0050	195000274	O-RING
0060	510101365	PISTON TURN
0070	196020017	TURC-GLYD-R.
0080	195000010	O-RING
0090	179930024	SNAPRING
0100	195000205	O-RING
0110	3000323	BACKRING
0120	510130501	BOLT
0130	195030169	O-RING
0140	196140148	BACKRING
0150	504930068	BUSHING
0160	120930155	CUP SPRING
0170	109880035	SHIM RING
0180	109880036	SHIM RING

8.2277.0001/ 0002

0010	520101177	CYLINDER
0020	109081008	VSTI G1/8-ED
	up to 06/ 2008	
	109120057	Screw M6 x 10
	as from 07/ 2008	
0030	510101284	PISTON RING
0040	196141048	BACKRING
0050	195030125	O-RING
0060	510101385	PISTON TURN
0070	196022021	TURC-GLYD-R
0080	195000012	O-RING
0090	179930028	BACKRING
0100	195000266	O-RING
0110	196141009	BACKRING
0120	510130501	BOLT
0130	195030169	O-RING
0140	196140148	BACKRING
0150	504930068	BUSHING
0160	120930155	CUP SPRING
0170	109880035	SHIM RING
0180	109880036	SHIM RING

8.2275.0102

0010	520101272	CYLINDER
0020	109081008	VSTI G1/8-ED
0030	510101382	PISTON RING
0040	3000605	BACKRING
0050	3000375	O-RING
0060	510101535	PISTON TURN
0070	196020011	TURC-GLYD-R.
0080	195000006	O-RING
0090	179930016	SNAPRING
0100	195000105	O-RING
0110	196141013	BACKRING
0120	510130606	BOLT
0130	195030169	O-RING
0140	196140148	BACKRING
0150	504930068	BUSHING
0160	120930155	CUP SPRING
0170	109880035	SHIM RING
0180	109880036	SHIM RING

8.2276.0102

0010	520101270	CYLINDER
0020	109081008	VSTI G1/8-ED
0030	510101360	PISTON RING
0040	3001138	BACKRING
0050	195000274	O-RING
0060	510101534	PISTON TURN
0070	196020017	TURC-GLYD-R.
0080	195000010	O-RING
0090	179930024	SNAPRING
0100	195000205	O-RING
0110	3000323	BACKRING
0120	510130606	BOLT
0130	195030169	O-RING
0140	196140148	BACKRING
0150	504930068	BUSHING
0160	120930155	CUP SPRING
0170	109880035	SHIM RING
0180	109880036	SHIM RING

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:

Hydraulic clamping nut
Type: 8.2273.xxxx
8.2274.xxxx
8.2275.xxxx
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8.2277.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 June 11, 2021
Nico Hanke
Managing Director