ROEMHELD
HILMA ▪ STARK

Operating manual

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

for **extending clamp** 200 kN with mechanical interlock
Type **2480-xxxx**

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PLEASE READ THE OPERATING MANUAL BEFORE INSTALLING THE EXTENDING CLAMPS AND PUTTING THEM INTO OPERATION FOR THE FIRST TIME!

1 General information, safety information and manufacturer's declaration

1.1 General

The safety of Hilma-Römheld extending clamps has been thoroughly checked. They are designed for use as specified in the Technical data. If the Technical data is not observed, the health of the operator and the proper functioning of the machine may be put at risk. Unauthorised modification or alteration of Hilma-Römheld extending 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 extending clamps are designed for the hydraulic clamping of dies and die changing tables on the press bed. Their use outside of presses or similar machines is not permitted.
In the unclamped position, the clamping point is released so that the die or the die changing table may be removed.
In the clamped position, the clamping lever is mechanically locked in a self-locking manner. Even in the case of a loss of the hydraulic pressure the clamping force will be maintained.
The extending clamp is installed on the press bed. It comes ready for hydraulic and electrical connection up to the 'extending clamp – machine' interface. The electrical interface to the sensors may be provided with Harting plugs (option extra).

1.3 Operating characteristics

Hilma-Römheld extending clamps may not be subjected to loads beyond the specified values. The maximum operating pressure must not be exceeded.

1.4 Temperatures

The maximum operating temperature for standard-type extending clamps is 70 °C. For higher temperatures, special designs should be used.

1.5 Important information on danger

- For hydraulic installation of the clamps only use suitable connecting elements (see chapter 4, installation)
- Fastening screws in the machine bed must be tightened applying the specified torque (see chapter 4, installation)
- Installation and repair work shall only be carried out when the system is out of operation.
- Do not exceed the specified pressures and temperatures.
- During clamping and unclamping, keep your hands away from the dangerous zone of the clamps.

Before putting the clamps 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 accessible to the operator. The operator must advise any other personnel of possible risks in the operating area.

1.6 Declaration

The extending clamp with mechanical interlock have been developed, designed and manufactured in conformity with the EC directive 'Machinery' 2006/42/EC. The unabridged version will be made available on request.

2 Design and function

2.1 Design

The extending clamp is made up of 3 main subassemblies (1. housing with clamping and locking mechanism; 2. housing with moving piston; 3. clamping lever). Hence, the design is simple and rugged.

2.2 Functional description

- Clamping

In the unclamping position , the clamping lever is retracted in the housing.
When applying pressure to port "A", the piston moves the clamping lever towards the clamping position. Through the hydraulic sequential control, pressure is applied to the clamping and locking mechanism.
The clamping lever is lowered onto the clamping edge. Once the clamping force has built up, the clamping element is mechanically blocked in a self-locking manner.

- Unclamping

When pressure is applied to port "B", the clamping and locking mechanism is unlocked, and the clamping lever is lifted from the clamping edge. Through the hydraulic sequential control, pressure is applied to the piston which makes the clamping lever retract into the unclamping position.

Both unclamping and clamping positions are monitored by proximity switches.

Prerequisites for perfect functioning
a) sufficient space at the clamping edge to allow for clamping lever movements
b) clamping edge tolerance according to specification.
(see chapter 3, Technical data, main dimensions)

3 Technical data, main dimensions

Extending clamp

Clamping force	200 kN
Perm. operating force	250 kN
Clamping edge *	**60** ± 0.2 mm
Operating pressure	100 bar
Max. volume flow	2.5 dm³/min
Oil consumption for clamping / unclamping	204 cm³ / 188 cm³
Screws DIN 912-8.8	M 24x100
Tightening torque	660 Nm
Weight	46 kg

Inductive proximity switches

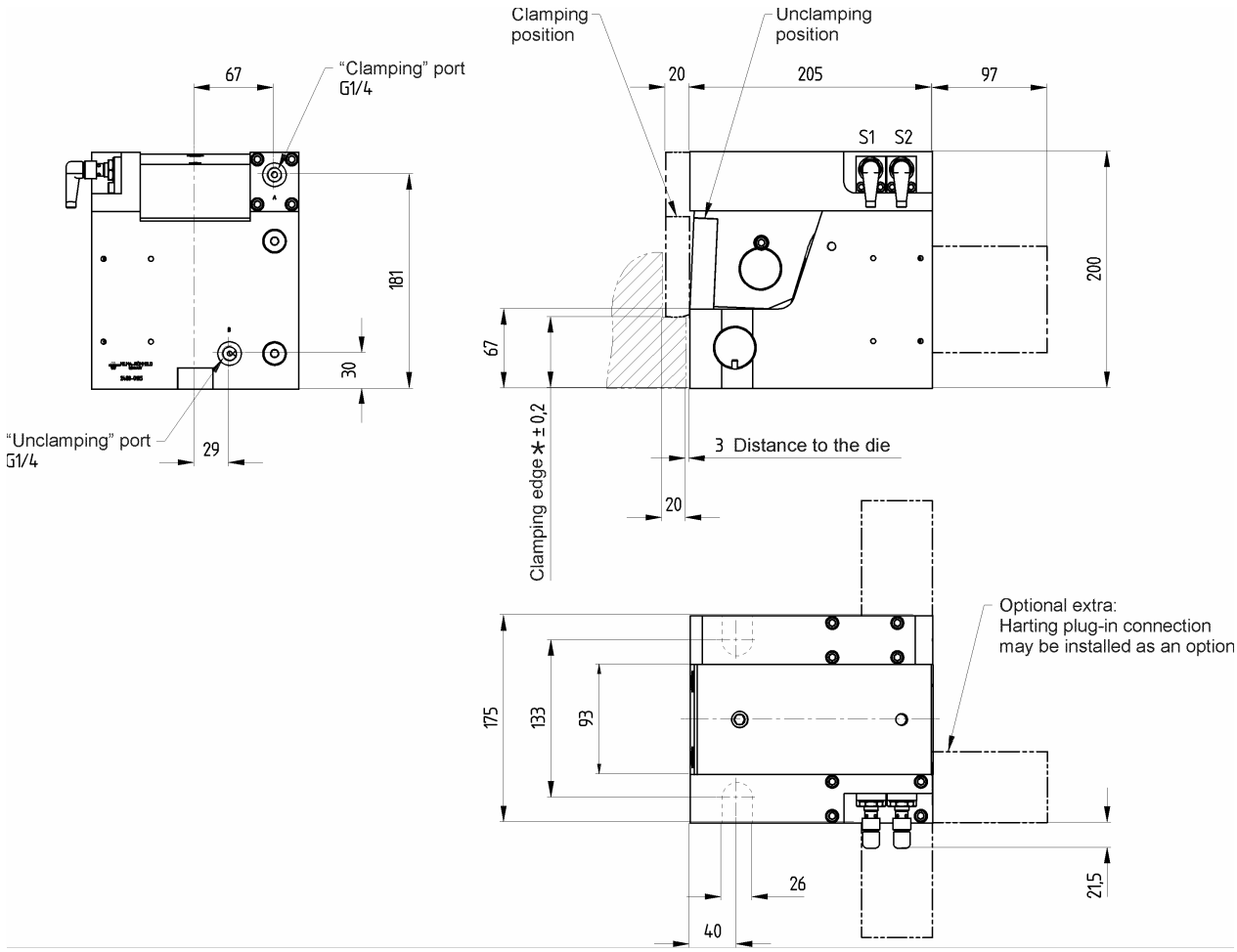
Manufacturer	Balluff
Type	BES 516-370-E5-C-S4
Voltage	24 (10-30) V DC

Electrical interface (optional extra)

Proximity switches with Harting plug-in connection	HAN 6 E

Hydraulic interface

Port A	G1/4 for clamping
Port B	G1/4 for unclamping



4 Installation and putting into operation

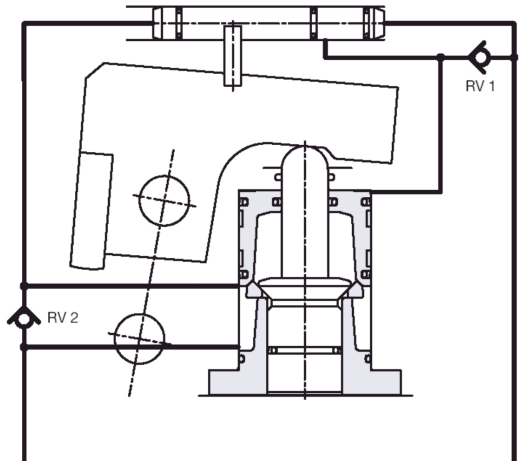
4.1 Installation

Align the extending clamp on the press bed at a distance of 3 mm from the clamping edge of the die or the die changing table. The extending clamp should be arranged in parallel to these clamping edges. Fasten the clamp using cheese head screws DIN 912 - M 24 x 100 - 8.8.
Tighten the screws applying a torque of 660 Nm.
For a drill pattern, please see the drawing in chapter 3 (Technical data, main dimensions).

4.2 Hydraulic installation

Connect the extending clamp, which comes ready installed until the 'extending clamp – machine' interface, using G1/4" screw connections to DIN 2353 (heavy-duty series). For connections, see chapter 3, Technical data, main dimensions.
The hydraulic lines on the machine side must be of sufficient size (8x1.5 DIN 2391-St35 NBK or larger), must be installed in accordance with the specifications (DIN EN 982) and must conform with up-to-date practice in high-pressure hydraulics. Pipes should be as short as possible. Pipe bends should have a large radius.
A 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.

Hydraulic shematics



4.3 Electrical installation

Pin assignment for Harting plugs (optional extra):

HAN 6 E (proximity switch)

		Contact
Unclamping position	brown +	1
	blue -	2
S1	white	3
Clamping position	brown +	4
	blue -	5
S2	white	6

4.4 Putting into operation

Read the operating manual before putting the system into operation!

Only use clean, fresh oil. Bleed the complete system at the highest point at low pressure (20bar), in order to eliminate any bubbles.

Set the operating pressure (100 bars) at the hydraulic pump unit.
Set the volume flow to 2.5 dm^3/min.

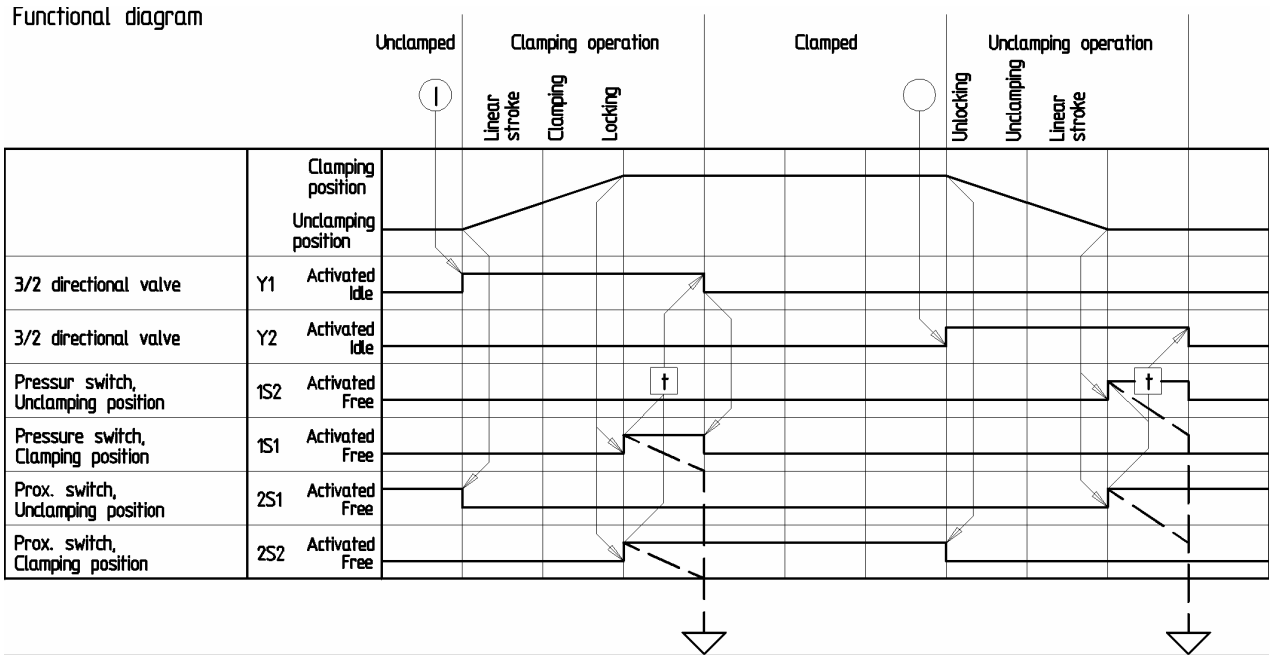
Clamp and unclamp the extending clamp several times without a die being inserted. Check whether clamping and unclamping occurs smoothly. Check the proximity switches for the unclamping and clamping positions for perfect function.

Check the hydraulic installation for tightness. Visually check the pipes, hoses, screw connections and clamps when under pressure.

ATTENTION: During clamping and unclamping, keep your hands and tools away from the clamping area. **Danger of injury!**

Controls:
For clamping and unclamping, the hydraulic pump should keep on running for a short period of time (i.e., t > 10 s) after the operating pressure (100 bars) has been reached, in order to ensure that the full clamping force is achieved and the clamping and locking element is completely blocked.

Clamping edge:
Check the clamping edge of the die and of the die changing table for correct height and tolerances. The clamping edge should have a width of at least 20 mm in order to provide space for the clamping lever movement.
(For dimensions, see chapter 3, Technical data and main dimensions).
Proper clamping can only be achieved when the required clamping edge dimensions are observed.



5 Trouble shooting

The extending clamp has left our premises in a 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 (Installation and putting into operation) has been duly observed, please try to discover the cause using the table below:

Failure	Possible cause	Remedial action
Clamping pressure is not maintained, pump is frequently running.	Untight screw connection / hydraulic connection. Seals of extending clamp worn.	Find leakage and retighten or replace screw connection while the system is pressureless. Have seals replaced by experts or return extending clamp for repair.
Proximity switch *'Unclamping position'* does not switch.	Voltage supply / signal feedback line interrupted. Proximity switch / cable defective.	Check all plug connections, contact assignments and cables. Proximity switch / cable => check / replace (see chapter 6: Maintenance and repair).
Extending clamp does not clamp or unclamp, incorrect sequence of movements.	Check if valves in the extending clamp are untight / dirty.	Uninstall check valves and clean or flush them, replace, if necessary.
Extending clamp does not clamp or lock.	Hydraulic pump unit switches off before the clamp is completely locked.	Hydraulic pump unit does not keep on running for a sufficient period of time (see chapter 4.4 Putting into operation / controls).
Proximity switch *'parking position'* does not switch.	Voltage supply / signal line interrupted. Proximity switch / cable defective.	Check all plug connections, contact assignments and cables. Proximity switch / cable => check / replace (see chapter 6 Maintenance and repair).

6 Maintenance and repair

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.
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When carrying out routine maintenance work on the press:
- inspect the electrical connections (plugs, cables) for damage
- check the hydraulic system for tightness.

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

In case of failure it is recommended that the extending clamp is replaced in order to reduce press downtimes. The repair can then be carried out off the press (if necessary at our works in Hilchenbach).

Repair works on the extending clamp, in particular on seals, on the clamping and unclamping mechanism and on the moving piston should only be carried out by qualified personnel.

ATTENTION
Before dismantling the extending clamp, disconnect the electrical and hydraulic lines!
Only dismantle the extending clamp when the clamping lever has retracted in the unclamping position!

After having replaced the extending clamp, clamp and unclamp it several times without a die being inserted in order to bleed the system through the pump unit (the same applies when hydraulic connections have been disconnected).

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

7 Technical appendix

The technical appendix comprises the list of spare parts and the installation drawing.

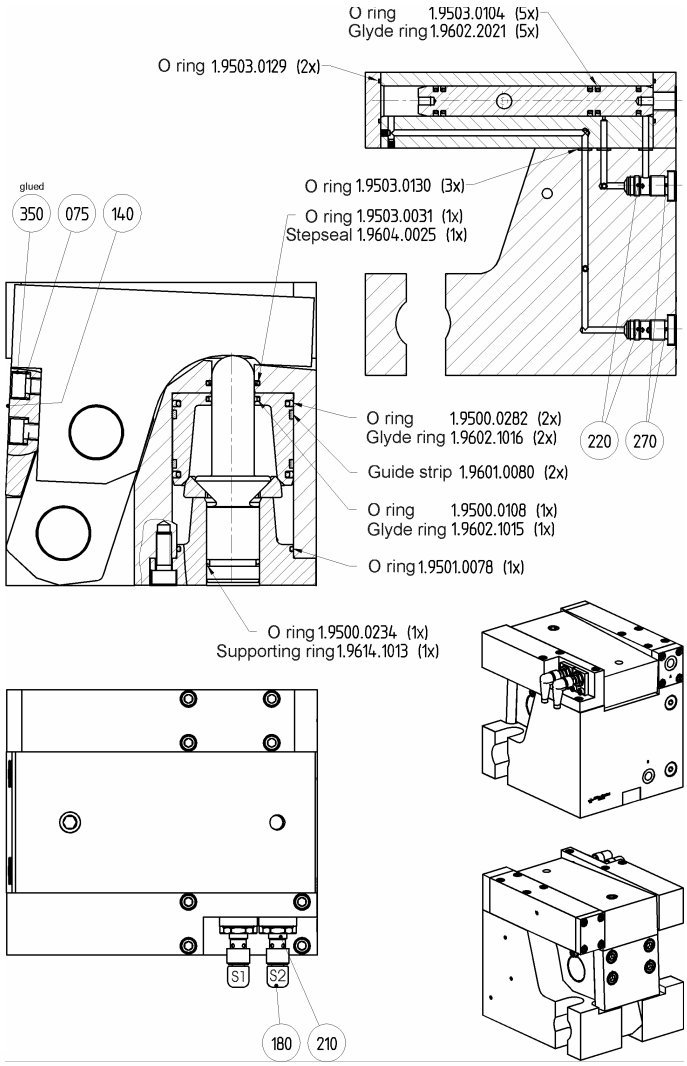
7.1 List of spare parts

Item no.	Designation	Part no.
075	Washer	5.1022.0226
140	Clamping bar	5.2056.0047
180	Coupler socket	2.0975.0024
210	Proximity switch	2.5012.0041
220	Check valve	2.9250.0068
270	Screw plug	1.0908.1009
350	Cheese head screw	1.0912.2103
999	Complete set of seals	7.2480.xxxx

When ordering, please quote the **part no**.,
the **item no.** and the **designation** of the required part
as well as the full **type no.** of the extending clamp!

Should a repair of the extending clamp be necessary, in particular due to damage to seals, to the clamping and locking mechanism or to the moving piston, we recommend to use a spare clamp and to return the defective extending clamp for repair to our Hilchenbach premises.

7.1 Installation drawings



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:

Extending clamp with mechanical interlock
Type 8.2480.xxxx

as supplied by us has been specifically designed for incorporation into a machine, taking full account of DIN-EN 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 982, DIN 24346 and EN 60204-1.

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Hilchenbach August 20, 2010
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