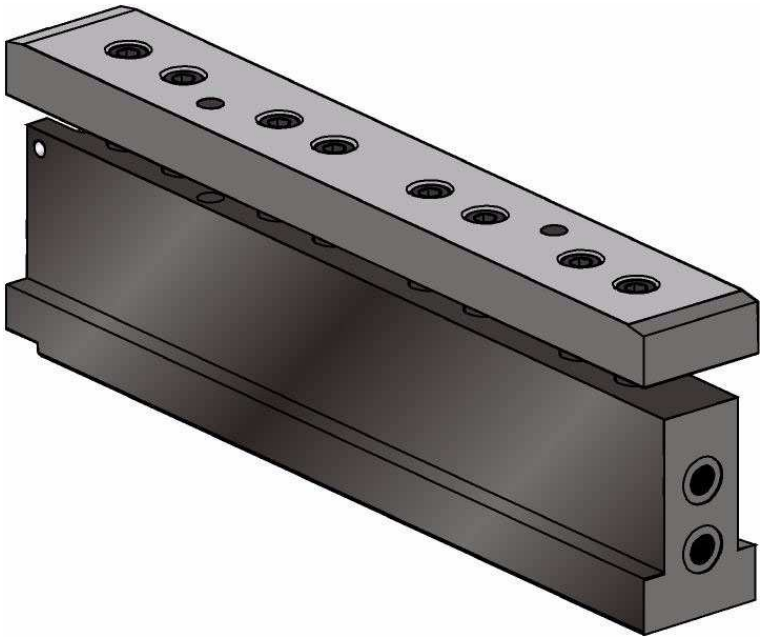
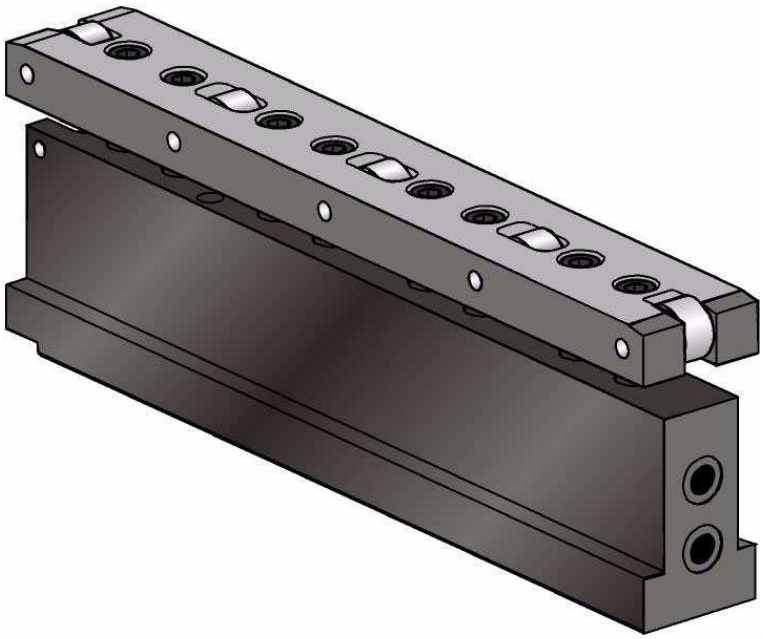
ROEMHELD
HILMA ▪ STARK

Operating Manual

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

Double-T Clamping bar single-acting	Type 1832-xx1x
Double-T Clamping bar double-acting	Type 1832-xx2x
Double-T Clamping bar double-acting with support rollers	Type 1832-xx3x
Double-T Clamping bar (special design)	Type 1832-8xxx





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Apr. 18 - Printed in Germany - Änderungen vorbehalten - Subject in modification

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

1 General information, safety information and manfacturer's declaration

1.1 General

The safety of Hilma-Römheld double-T 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 double-T 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 double-T clamping bars are designed for use in T-slots of presses or similar machines. Any operation of the double-T clamping bars other than in presses or similar machines is inadmissible. The dies to be clamped must also be provided with a T-slot.
Double-T clamping bars without support rollers should preferably be used with a press slide but are also suitable for a press bed.
Double-T clamping bars with support rollers are for use with a press bed.

1.3 Operating characteristics

The load values specified for Hilma Römheld double-T clamping bars must not be exceeded. The specified clamping and load-bearing forces are only achieved when full use is made of the whole length of the bars and when all support rollers are in contact. The maximum operating pressure must not be exceeded (see chapter 3 Technical Data, Main dimensions or catalogue, product group 2, pages 10 - 13).

Attention: Overloading the bar at either end area may lead to lifting of the bar end which is not under load! (Only applicable to the design with support rollers)

1.4 Temperatures

The maximum operating temperature for the standard design is 70°C. In case of higher temperatures special designs must be used.

1.5 Important safety information

- Hydraulic installation must only be carried using the connecting piece supplied (see chapter 4.1, Installation).
- Compare the load-carrying capacity of the double-T clamping bars and the weight of the die.
- Secure the die to prevent unintentional movement (falling down).
- Installation and repair work must only be carried out when no pressure is applied to the system.
- Do not exceed the specified operating pressures and temperatures.
- During clamping and unclamping, keep your hands and the die out of the movement zone of the double-T clamping bars.

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 readily accessible.

1.6 Declaration

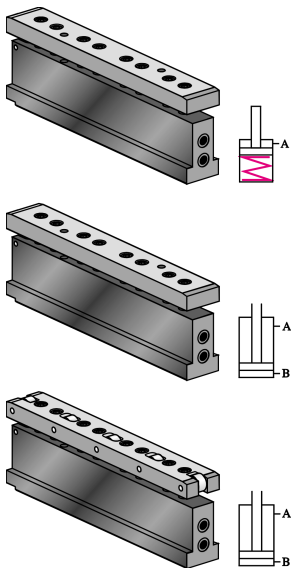
The Double-T clamping bars have been developed, designed and manufactured in conformity with the EC directive 'Machinery' 2006/42/EC. The unabridged version will be made available on request.

2 Design and function

2.1 Design

Double-T clamping bars consist of single segments which are connected by means of connectors.
Attention: When lifting or clamping, make sure that >90% of the segment length is used (covered)! (Segment length: T slot 18 = 150 mm, T slot 22 and 28 = 300 mm)

2.2 Functional description

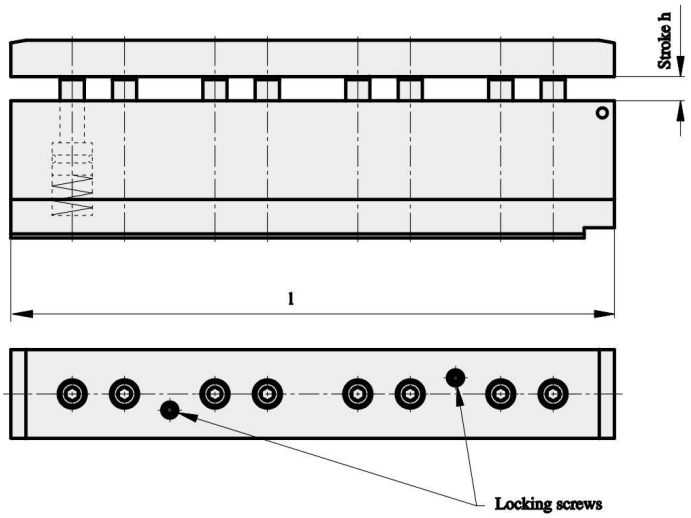


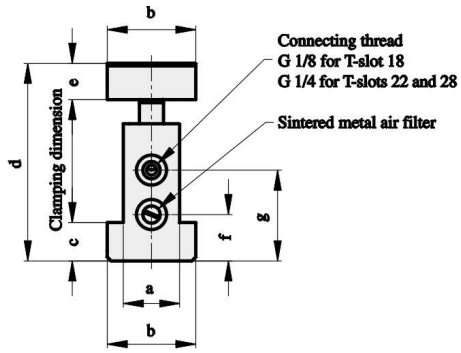
Double-T clamping bar single-acting / double-acting
The double-T clamping bars are installed in a T-slot on the press slide.
The segments of single-acting bars are locked into the root of the slot by means of 2 locking screws.
Double-acting bars are locked, when they are unclamped (pressure to port B), in the root of the slot by means of the integral locking piston.
Once the die is loaded into the machine, pressure is applied to port A. The die is clamped.
Double-acting bars are unlocked by releasing pressure at port A and by applying pressure to port B.
Single-acting bars are automatically unlocked by spring return once pressure is released at port A..
Single-acting double-T clamping bars can also be used as adaptive/adjustable clamping elements. After positioning the die in the machine, the bars are pushed into the T-slots. This requires a hose of appropriate length. These long hoses are available from Hilma-Römheld.

Double-T clamping bars, double-acting with support rollers
The double-T clamping bars are installed in a T-slot of the press bed.
When unclamped (pressure to port B), they are locked in the root of the slot by means of the integral locking piston. On the support rollers of the double-T clamping bar, the die is moved into the machine. When pressure is released at port B and pressure is applied to port A, the die is lowered and clamped.
When pressure is released at port A and pressure is applied to port B, the die is unclamped and lifted. It can then be moved out of the machine on the support rollers.

3 Technical data, Main dimensions

Double-T clamping bar
single-acting



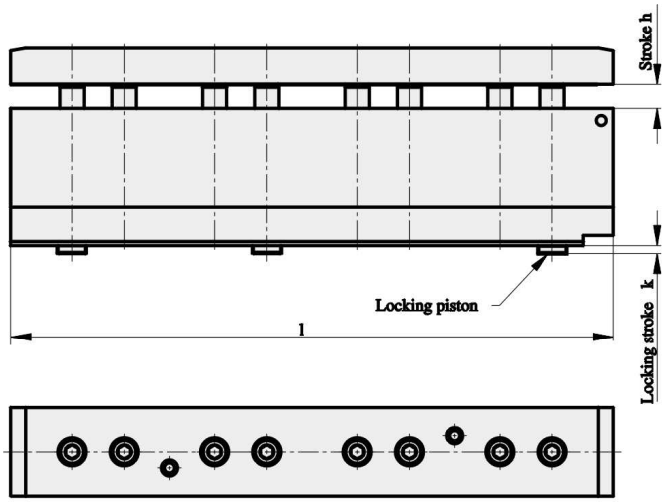


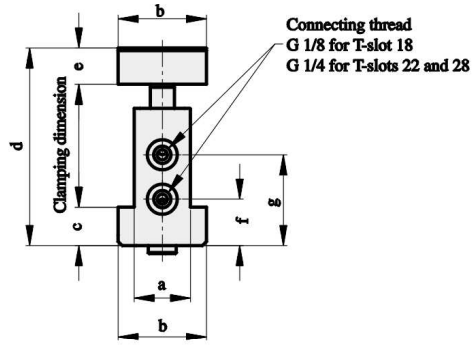
Slot (a) (mm)	b (mm)	c (mm)	d min (mm)	d max (mm)	e (mm)	g (mm)	Clamping dimension (mm)	Stroke h (mm)	Max. operating pressure (bar)
18	28	11,5	55	63	11	30,5	33,5 + 6	8	400
22	35	15,0	70	80	15	41,0	41,0 + 8	10	400
28	44	19,0	89	101	18	46,0	53,0 +10	12	400

Part no.	T-slot (a) (mm)	Length (l) (mm)	Clamping force (kN) at 400 bar
8.1832.1810	18	150	16,6
8.1832.1812	18	300	33,2
8.1832.1814	18	450	49,8
8.1832.1816	18	600	66,4
8.1832.1818	18	750	83,0
8.1832.2210	22	300	39,2
8.1832.2212	22	600	78,4
8.1832.2214	22	900	117,6
8.1832.2216	22	1200	156,8
8.1832.2218	22	1500	196,0
8.1832.2810	28	300	64,0
8.1832.2812	28	600	128,0
8.1832.2814	28	900	192,0
8.1832.2816	28	1200	256,0
8.1832.2818	28	1500	320,0

Double-T clamping bar

double-acting



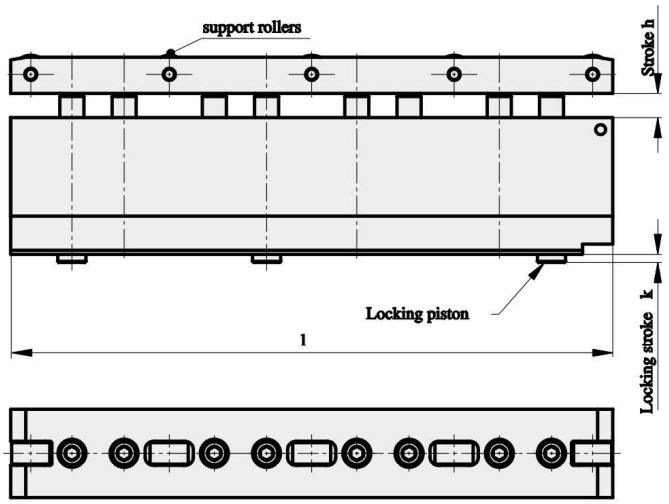


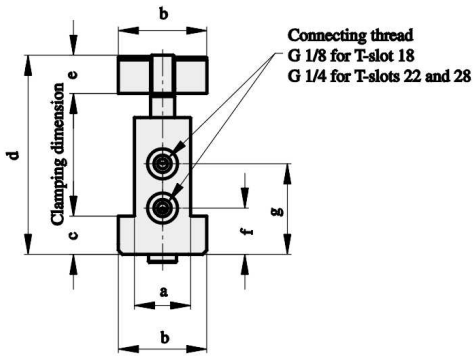
Slot (a) (mm)	b (mm)	c (mm)	d min (mm)	d max (mm)	e (mm)	f (mm)	g (mm)	Clamping dimension (mm)	Stroke h (mm)	Locking stroke k (mm)	Max. operating pressure (bar)
18	28	11,5	55	63	11	13,5	30,5	33,5 + 6	8	2,5	400
22	35	15,0	70	80	15	18,0	41,0	41,0 + 8	10	3,0	400
28	44	19,0	89	101	18	23,0	46,0	53,0 +10	12	4,0	400

Part no.	T-slot (a) (mm)	Length (l) (mm)	Clamping force (kN) at 400 bar
8.1832.1820	18	150	16,6
8.1832.1822	18	300	33,2
8.1832.1824	18	450	49,8
8.1832.1826	18	600	66,4
8.1832.1828	18	750	83,0
8.1832.2220	22	300	39,2
8.1832.2222	22	600	78,4
8.1832.2224	22	900	117,6
8.1832.2226	22	1200	156,8
8.1832.2228	22	1500	196,0
8.1832.2820	28	300	64,0
8.1832.2822	28	600	128,0
8.1832.2824	28	900	192,0
8.1832.2826	28	1200	256,0
8.1832.2828	28	1500	320,0

Double-T clamping bar

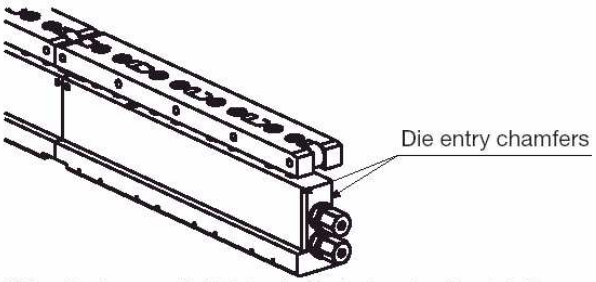
double-acting with support rollers



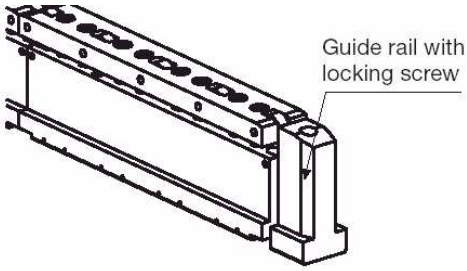


Slot (a) (mm)	b (mm)	c (mm)	d min (mm)	d max (mm)	e (mm)	f (mm)	g (mm)	Clamping dimension (mm)	Stroke h (mm)	Locking stroke k (mm)	Max. operating pressure (bar)
18	28	11,5	56	64	12	13,5	30,5	33,5 + 6	8	2,5	400
22	35	15,0	71	80	16	18,0	41,0	41,0 + 8	10	3,0	400
28	44	19,0	90	102	19	23,0	46,0	53,0 +10	12	4,0	400

Part no.	T-slot (a) (mm)	Length (l) (mm)	Load-begrin capacity (kN) at 400 bar	Clamping force (kN) at 400 bar	Number of suppor rollers
8.1832.1830	18	150	9	16,6	3
8.1832.1832	18	300	18	33,2	6
8.1832.1834	18	450	27	49,8	9
8.1832.1836	18	600	36	66,4	12
8.1832.1838	18	750	45	83,0	15
8.1832.2230	22	300	32	39,2	5
8.1832.2232	22	600	64	78,4	10
8.1832.2234	22	900	96	117,6	15
8.1832.2236	22	1200	128	156,8	20
8.1832.2238	22	1500	160	196,0	25
8.1832.2830	28	300	37,5	64,0	5
8.1832.2832	28	600	75,0	128,0	10
8.1832.2834	28	900	112,5	192,0	15
8.1832.2836	28	1200	150,0	256,0	20
8.1832.2838	28	1500	187,5	320,0	25



If the dies have a slight lateral offset when loading into the machine, the double-T clamping bars are protected by die entry chamfers at the connection end.



If the lateral offset of the dies is more significant (up to 1.5 mm), or if the dies are not loaded into the machine at the connection end of the double-T clamping bars, it is recommended that separate guide rails are used. They are fastened in the T-slot using clamping bolts. Special guide bar designs are available on request (e.g. with hydraulic ports for the connection end).

Guide rail for slot T 18	**7.1832.0015**
Guide rail for slot T 22	**7.1832.0016**
Guide rail for slot T 28	**7.1832.0017**

The die must be positioned and guided in such a way that there is no possibility of collision with the double-T clamping bar, especially with the movable upper clamping bar when inserting or extending the die (e.g. by providing separate guides on the machine bed or on the ram).

The T-slots of the die must be designed so that there is no possibility of collision with the double-T clamping bar, especially with the movable upper clamping bar when inserting or extending the die.

In the case of single-acting and double-acting double-T clamping bars without support rolls, make sure that the upper movable clamping bar is not in contact with the die T-slot when moving the die with the double-T clamping bar extended.

In the case of double-acting double-T clamping bars with support rolls, make sure that the die is lifted when being shifted while the double-T-clamping bar is extended so that it moves against the support rolls of the movable upper clamping bar with a max. offset in height of ± 0.2 mm (e.g. by using suitably arranged support consoles or suitable lifted roller or ball bars).

In order to avoid damage to the double-T clamping bar, transverse forces must never have an effect on the upper clamping bar or on the support and clamping pistons, neither while the die is being changed nor in the clamped condition during press operation. During die change, the die must be guided appropriately, and the T-slots in the die must be designed appropriately. Any possibility of collision with the other die must be excluded.

4 Installation, connection and putting into operation

4.1 Installation

- Clean the slots before inserting the double-T clamping bars.
  The root of the T-slot and the clamping surface of all T-slots must be parallel to the surface of the bed and slide.
- Insert and position the bars.
- Single-acting bars are locked in the root of the slot by means of the integrated locking screws.
- For hydraulic connection, the connecting pieces supplied should be used.
- Installation work must be carried out when no pressure is applied to the system.

- The dimension of the T-slot in the bed and in the slide must not exceed c+k-1
  (see chapter 3 Technical data, main dimensions)
- Provide outer edges of the die and openings in the die with chamfers in order to prevent the bars from being damaged.

4.2 Hydraulic installation

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 ISO 4413) and must conform with up-to-date practice in high-pressure hydraulics. Pipes should be as short as possible. For single acting cylinders with 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.
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.

4.3 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.

Clamp and unclamp the clamping elements in the parking station several times. Check whether clamping and unclamping occurs smoothly.

Check the hydraulic system for tightness by a visual inspection of the pipes and hoses, screw fittings and clamping elements while pressure is applied.

- When loading the die, pay attention to the edges which may cause pinching.
- Secure the die so that it can not fall down. Provide stops at the end of the die moving range.
- Provide pressure generators with a pressure relief valve which is set to the operating pressure.
- Secure the clamping bars against pressure peaks arising from external action.
- Unload the die by sliding it either manual or motor-driven, depending on its weight.
- Position the die on the lifted bars (version with support rollers).

ATTENTION: When moving, clamping and unclamping the die, keep hands and tools away from the range of movement. **DANGER OF INJURY!**

Control:
In the case of *single-acting double-T clamping bars,* the time provided in the control sequence between unclamping of the bar and moving of the die must be sufficiently long (t>3s), in order to ensure that the clamping element is unclamped before the die is moved.

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.

5 Trouble shooting

When delivered, the double-T clamping bar is in perfect condition. All functions have been checked, and necessary adjustments have been made.
If malfunction should occur although the information contained in chapters 4.0 (Installation and connection) and 5.0 (Putting into operation) has been duly observed, please try to find out the cause using the table below:

Failure	Possible cause	Remedial action
The die is not clamped or the clamping bar does not unclamp	- The hydraulic system has not been bled or is not tight - The adjusted operating pressure is not correct - The T-slot in the bed, in the slide or in the die does not have the correct dimensions	- Bleed the hydraulic system - Correct the operating pressure - Adapt the geometry of the T-slot or use a special bar - Check the hydraulic lines and connections to the pump unit
Single-acting bar: The bar does not unclamp or unclamps too slowly	- Dynamic pressure in the hydraulic line is too high for spring return	- Correct hydraulic system with respect to dynamic pressure (shorter lines, larger cross sections)
Double-acting bar: Die is not lifted	- The hydraulic system has not been bled or is not tight - The adjusted operating pressure is not correct - The T-slot in the bed, in the slide or in the die does not have the correct dimensions -Weight of the die too great	- Bleed the hydraulic system - Correct the operating pressure - Adapt the geometry of the T-slot or use special bar - Check the hydraulic lines and connections to the pump unit
Double-acting bar: Die sluggish to move	- The lateral die guides are jammed or the die is jammed on the double-T clamping bar - The support rollers are sluggish under load (in the case of uneven or soft running surface, the necessary movement force is higher) - The bar is damaged - The T-slot in the bed, in the slide or in the die does not have the correct dimensions	- Align the lateral die guides - Replace the support rollers - Repair the clamping bar - Adapt the geometry of the T-slot or use special bar

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.

Double-T clamping bars do not require special maintenance.

When carrying out routine maintenance work on the press:
- check the hydraulic system for tightness.
- inspect the support rollers.
- clean the double-T clamping bar, if necessary.

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 double-T clamping bar 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).

After having replaced the bar, clamp and unclamp it in the parking station several times 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.

If the double-T clamping bars need to be repaired, especially in the case of damage to the clamping and locking pistons or to the clamping bars, it is recommended that the double-T clamping bar is replaced . The repair can then be carried out at our works in Hilchenbach!

7.1 List of spare parts

Spare parts for double-T clamping bar for **T-slot 18**

	Spare part	Type 1832-181x	Type 1832-182x	Type 1832-183x
A	1x support roller 1x pin	- -	- -	1.0617.0010 1.6325.0030
B	1x connector 2x pin	5.1017.0048 1.7344.0012	5.1017.0048 1.7344.0012	5.1017.0048 1.7344.0012
C	1x plug-in connector	9210-132	9210-132	9210-132
D	1x connecting bar 2x pin 2x countersunk screw	5.0495.0459 1.7343.0004 1.7991.0017	5.0495.0459 1.7343.0004 1.7991.0017	5.0495.0459 1.7343.0004 1.7991.0017
E	1x segment, complete *	7.1832.0006A/Z/E**	7.1832.0007A/Z/E**	7.1832.0008A/Z/E**

Spare parts for double-T clamping bar for **T-slot 22**

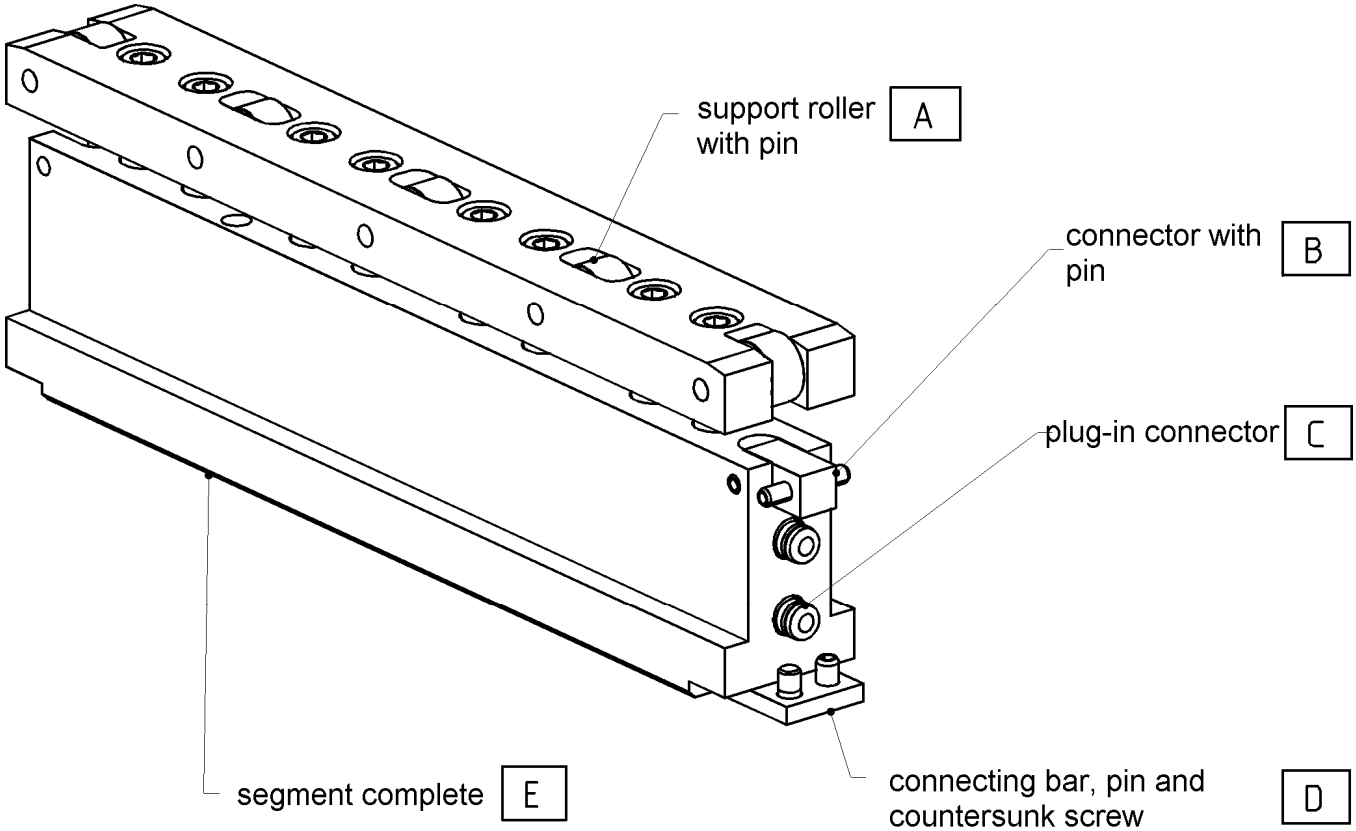
	Spare part	Type 1832-221x	Type 1832-222x	Type 1832-223x
A	1x support roller 1x pin	- -	- -	1.1210.0021 1.6325.0072
B	1x connector 2x pin	5.1017.0047 1.1481.0139	5.1017.0047 1.1481.0139	5.1017.0047 1.1481.0139
C	1x plug-in connector	9210-132	9210-132	9210-132
D	1x connecting bar 2x pin 2x countersunk screw	5.0495.0459 1.7343.0004 1.7991.0017	5.0495.0459 1.7343.0004 1.7991.0017	5.0495.0459 1.7343.0004 1.7991.0017
E	1x segment, complete *	7.1832.0009A/Z/E**	7.1832.0010A/Z/E**	7.1832.0011A/Z/E**

Spare parts for double-T clamping bar for **T-slot 28**

	Spare part	Type 1832-281x	Type 1832-282x	Type 1832-283x
A	1x support roller 1x pin	- -	- -	6.3300.6220 1.6325.0022
B	1x connector 2x pin	5.1017.0047 1.1481.0143	5.1017.0047 1.1481.0143	5.1017.0047 1.1481.0143
C	1x plug-in connector	9210-132	9210-132	9210-132
D	1x connecting bar 2x pin 2x countersunk screw	5.0495.0455 1.1481.0160 1.7991.0029	5.0495.0455 1.1481.0160 1.7991.0029	5.0495.0455 1.1481.0160 1.7991.0029
E	1x segment, complete *	7.1832.0012A/Z/E**	7.1832.0013A/Z/E**	7.1832.0014A/Z/E**

* Segment, completely assembled with plug-in connectors and connecting pieces.
**When ordering, please add the code letter to the order number.
- **„A“** for **connecting bar** (with connecting thread G1/8 or G1/4)
- **„Z“** for **intermediate bar**
- **„E“** for **end bar** (with closed oil ports).

7.2 Installation 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:

Double-T clamping bars
Type 8.1832.xx1x
Type 8.1832.xx2x
Type 8.1832.xx3x
Type 8.1832.8xxx

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

Responsible for the document
Frank Grosche
Schützenstraße 74
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Hilchenbach August 20, 2010
H.- J. Molka
Managing Director