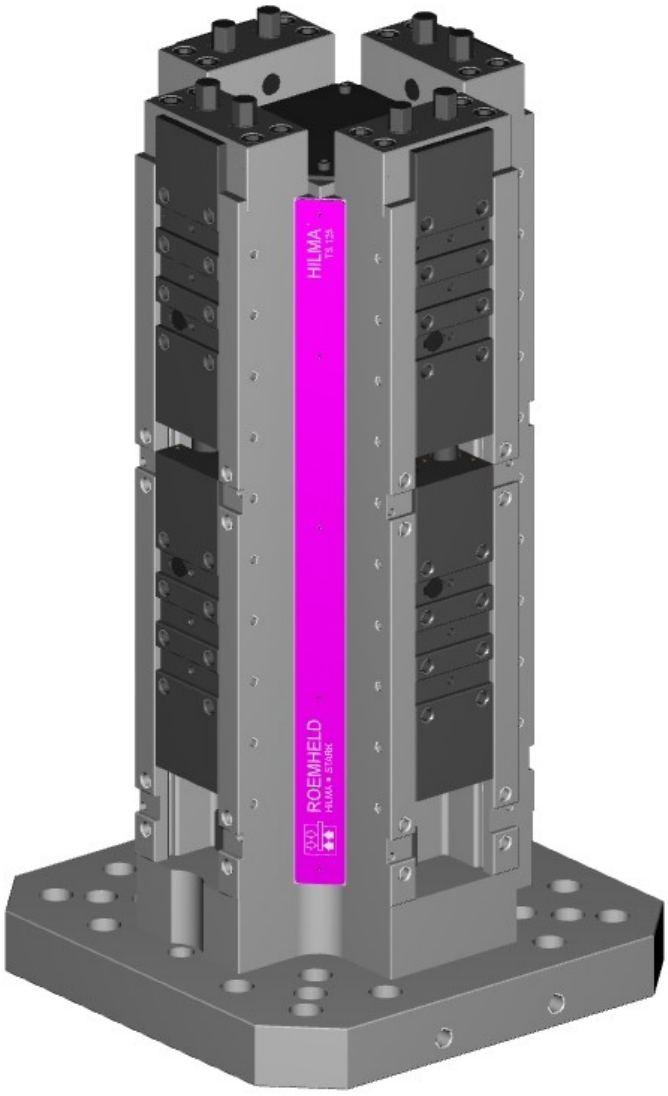
ROEMHELD
HILMA ▪ STARK

Operating Manual

incl . Declaration of Incorporation and Installation Instructions
for incomplete machines as per machinery directives 2006/42/EC

Workholding System TS 100/125 Vector
Version 2x Fixed jaw

Type 9.3390.xxxx



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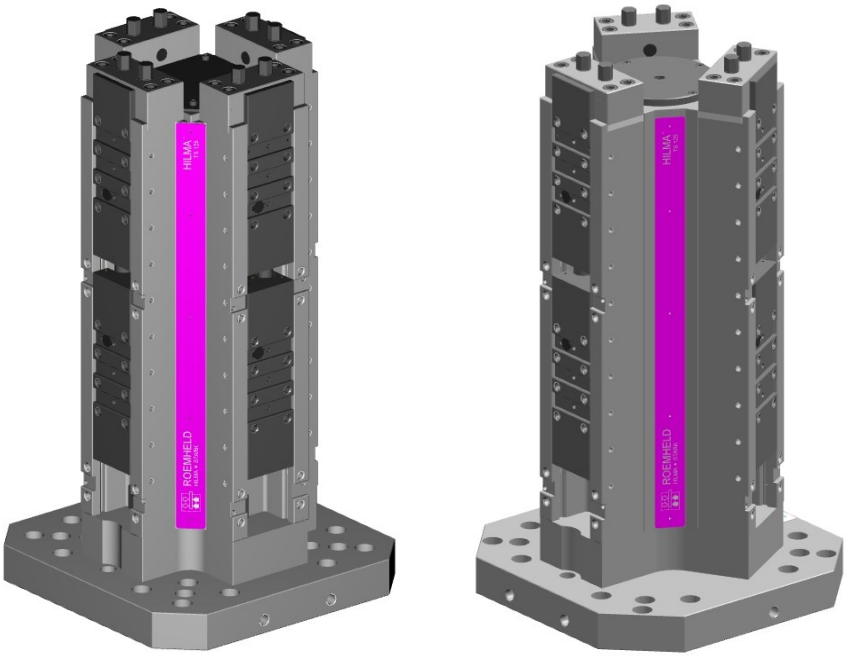
CONTENT

To ensure safe and functional operation,
it is imperative to read the operating manual before installation and start up!

1.1 Series



1.2 Description of the clamping system

- The mechanical tower workholding system TS100/125 Vector is designed for universal workpiece clamping on machine tools and for clamping one to two workpieces per side by means of separate spindles.
- The clamping points can be loaded with differently-sized workpieces.
- The 2 slides, which can be adjusted independently of each other, allow the workpiece insertion in sequence, which is particularly advantageous for “top-heavy” parts.
- When the clamping jaws are mounted, the slides are guided without play and the spindle moves smoothly.
- Construction easy to maintain. After disassembly of the clamping jaws and the bearing plate (in older versions also remove the middle stop screw), the spindle unit can be completely removed from the lower part (see section 2.7.1. Maintenance and care).

1.3 For your safety

Basic information

The operating manual serves for information and avoidance of dangers when installing the products into the machine as well as information and references for transport, storage and maintenance.
Only in strict compliance with this operating manual, accidents and property damages can be avoided as well as trouble-free operation of the products can be guaranteed.
Furthermore, the consideration of the operating manual will:

- avoid injuries
- reduce down times and repair costs,
- increase the service life of the products.

- Before start up, carry out a collision check taking into account the working space of the machine.
- Screw the clamping system immovably onto the machine table.
- The workpiece clamping forces must be high so that the machining forces cannot move the workpiece.
- During start up and in continuous operation, suitable measures must be taken to prevent any danger of crushing due to the slide stroke.
- For safe clamping, only part of the hydraulic power stroke may be used as the insertion clearance.
- Check clamping force regularly using a force measuring gauge.
- Install protective guards or provide two-hand control to prevent hazards (crushing).

Safety instructions

The product was manufactured in accordance with the generally accepted rules of the technology.
Observe the safety instructions and the operating instructions given in this manual, in order to avoid personal or material damage.

- Read this operating manual thoroughly and completely, before you work with the product.
- Keep this operating manual so that it is accessible to all users at any time.
- Pay attention to the current safety regulations, regulations for accident prevention and environmental protection of the country in which the product will be used.
- Use the ROEMHELD product only in perfect technical condition.
- Observe all notes on the product.
- Use only accessories and spare parts approved by the manufacturer in order to exclude danger to persons because of not suited spare parts.
- Respect the intended use.
- You only may start up the product, when it has been found that the incomplete machine or machine, in which the product shall be mounted, corresponds to the country-specific provisions, safety regulations and standards.

- Perform a risk analysis for the incomplete machine, or the machine.
  Interactions between the product and the machine/fixture or its environment may result in risks, which may only be identified and minimized by the user, e.g.:
  - forces generated,
  - movements initiated,
  - influence of hydraulic and electrical control,
  - etc.
- Use of personal protective equipment is to be considered for all work steps.

Use

Intended use

The products are exclusively designed for clamping workpieces in industrial applications.
In addition, use in compliance with the intended purpose includes:

- Use within the capacity limits specified in the technical data (see data sheet).
- Use as described in this operating manual.
- Compliance with maintenance intervals.
- Qualified and trained personnel for the corresponding activities.
- Mounting of spare parts only with the same specifications as the original part.
- Solely clamping jaws may be moved.

Inappropriate use

⚠ WARNING

Injuries, material damages or malfunctions!

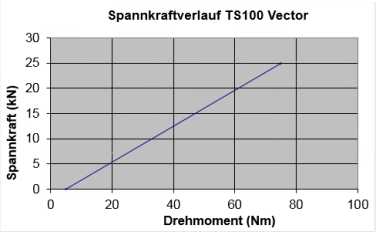
- Do not modify the product!

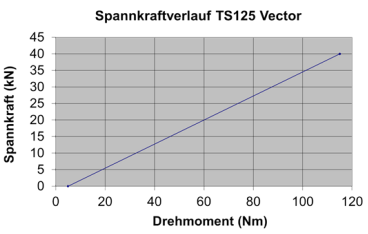
The use of these products is not admitted:

- For domestic use.
- On pallets or machine tool tables in primary shaping and metal forming machine tools.
- If due to physical/chemical effects (vibrations, welding currents or others), damages of the products or seals can be caused.
- In machines, on pallets or machine tool tables that are used to change the characteristics of the material (magnetise, radiation, photochemical procedures, etc.).
- In areas for which special guidelines apply, especially installations and machines:
  - For the use on fun fairs and in leisure parks.
  - In food processing or in areas with special hygiene regulations.
  - For military purposes.
  - In mines.
  - In explosive and aggressive environments (e.g. ATEX).
  - In medical engineering.
  - In the aerospace industry.
  - For passenger transport.

1.4 Technical data

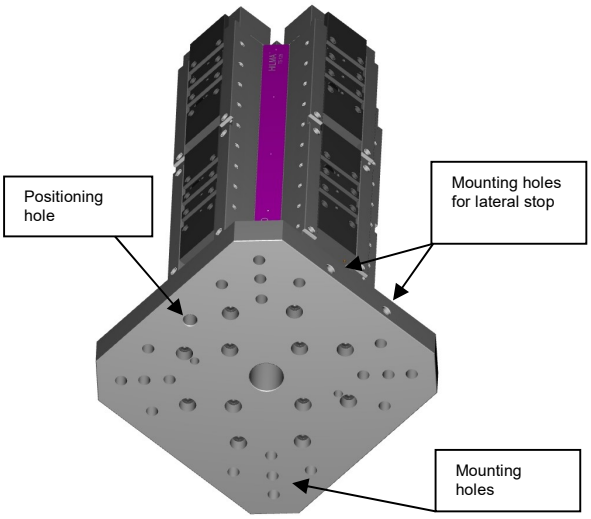
Jaw width mm	Clamping force kN	Torque Nm	Clamping stroke mm
100	25	70	40
125	40	115	47





1.5 Delivery

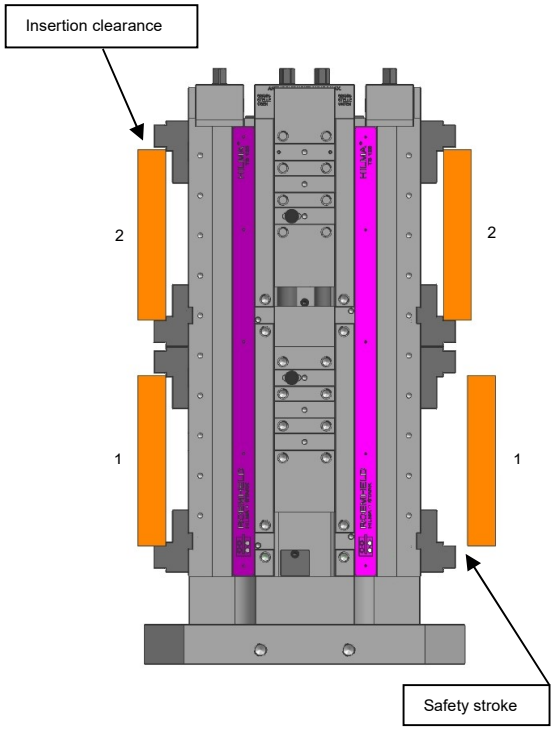
The clamping system is supplied in assembled condition including operating manual.



2.1 Fixing on the machine table

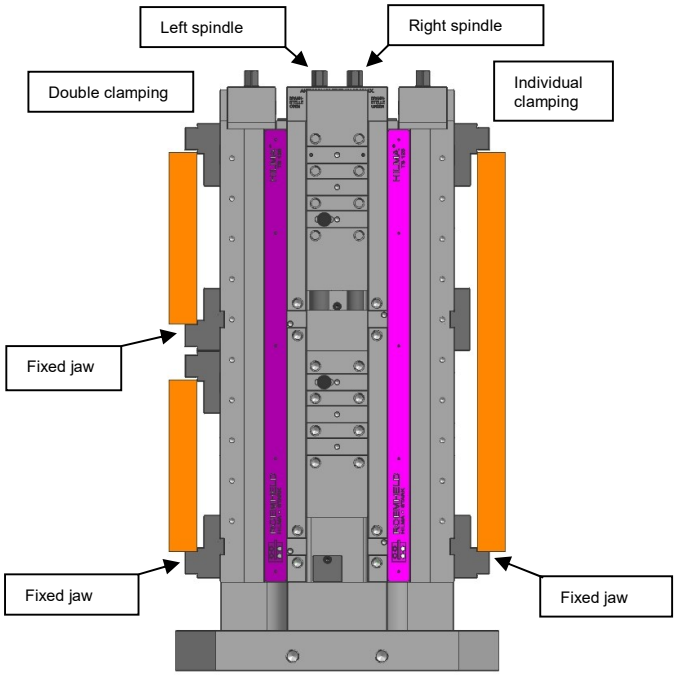
The clamping systems must be fixed in such a way that they cannot be displaced by machining forces.

- Unevenness and chips between the contact surface and the base surface shall be removed.
- Before start up, carry out a collision check taking into account the working space of the machine.
- Alignment
  - with the dial gauge
  - with positioning pins
  - at side stop
- Fixing
  - with screws.



2.2 Setting the clamping range

- By rotating the spindle counterclockwise, open the tower workholding system until the stop.
- Select and fix the appropriate set of jaws for the workpieces. Pay attention to the cleanliness between the jaws and the guide.
- Insert workpiece 1 and place it against the fixed jaw using the right spindle and clamp with max. 40 kN.
- Insert workpiece 2 and place it against the fixed jaw using the left spindle and clamp with max. 40 kN.
- Check safety stroke (min. 2 mm). Remove workpieces 1 and 2 and turn the spindles clockwise.



2.3 Clamping and unclamping

- By rotating the right spindle clockwise using a torque wrench, first workpiece 1 (lower clamping point) is clamped with 40 kN, then workpiece 2 (upper clamping point) is inserted and clamped with the same clamping force by rotating the left spindle. When unclamping counterclockwise, workpiece 2 is first released with the left spindle and then workpiece 1 with the right spindle.
  Attention:
  Violent rotating will damage the system

2.3 1 Individual clamping

- Remove the middle fixed jaw and replace it with the cover plate (only the left spindle is used for clamping).

2.4 Workpiece support

- The workpieces are always placed on the clamping jaws or on the workpiece supports.
- The guideway of the lower part is **not** permitted as workpiece support

2.5 Error messages

Fault	Cause	Remedy
Inaccurate angular position of the movable jaw	Due to unclean assembly swarf between jaws and guide	Disassemble jaws, clean, remove if necessary, lubricate and assemble
Workpiece is not clamped despite introduction of the correct torque .	Clamping range overlap not sufficient	See 2.2 Setting the clamping range
Spindle stiff	Grease lubrication washed out by emulsion	Lubricate spindle and bearing

2.6 Operation

⚠ WARNING

Vibration will loosen the product fixture!

Vibration affects the workpiece fixture and results in an improperly fixed workpiece. An improperly fixed workpiece may be catapulted off the product during processing and result in personal injuries or damage to property.

- Exclude vibration on the product if possible.

Risks of burns caused by hot workpieces!

Hot workpieces may cause burns on parts of the body.

- Wear heat-resistant protective clothing.

Risk of injuries during workpiece clamping!

The workpiece properties may induce personal injuries during clamping if the workpiece is not clamped properly.

- Remove contamination on the clamping surfaces before clamping.
- Observe material properties of the workpiece during clamping.
- Observe workpiece shape during clamping.
- Observe workpiece clamping surface during clamping.
- Observe workpiece inertia during clamping.

⚠ CAUTION

Risk of injuries by crushing of extremities during clamping

The product is to be used in a manner so that the operator's own or other persons' extremities may not be squeezed during clamping.

- Keep your own or other persons' extremities off the clamping area during clamping.

Risk of injuries due to exertion during clamping and unclamping of the product

When unclamping the product, high forces have to be overcome initially. Persons may slip off the product during unclamping and be injured.

- Be careful and proceed slowly when unclamping the product.

2.7. Maintenance

⚠ WARNING

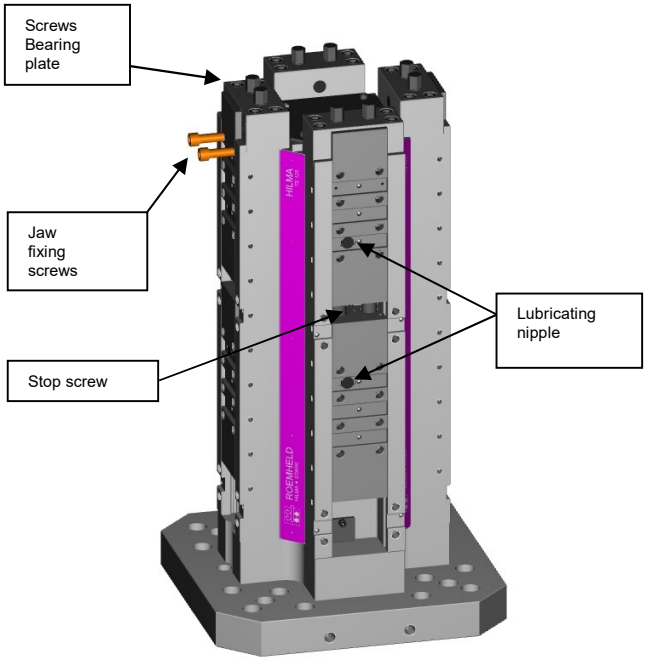
Burning due to hot surface!

- In operation, surface temperatures of over 70°C may develop on the product.
- Maintenance and repair work should only be performed in a cooled down condition and/or with protective gloves.

Risk of injuries by breaking product parts!

Due to overload or faulty operation during operation, product parts may break, and this may cause personal injuries.

- Observe maintenance intervals for all parts pursuant to this Operation Manual.



2.7.1 Maintenance and care

- In addition to normal cleaning of the spindle and bearings, lubricate with grease at regular intervals via the grease nipples (e.g.: BP Energrease LS-EP 2).
- For basic cleaning, unscrew the jaws and after disassembly of the bearing plate (in older versions also remove the middle stop screw), the spindle slide unit can be completely removed from the lower part by means of two jaw fixing screws. Then clean and lubricate.

2.8 Maintenance plan

Maintenance works	Interval	Realisation
Cleaning	As required	Operator
Regular checks	daily	Operator
Regular lubrication (with bed way oil, e.g. Vactra 2)	At the latest after 5,000 clamping cycles Alternatively 1 per week	⚠ **Caution!** If this lubrication will not be made, this can lead to a failure of the clamping system!
Repair		Qualified personnel

2.9 Cleaning

⚠ CAUTION

Damage to moving components!

Avoid damage to movable components (rods, plugers, bolts, etc.) as well as wipers and seals.

Aggressive cleaning agents

The product must not be cleaned with:

- corrosive or caustic substances or
- organic solvents such as halogenated or aromatic hydrocarbons and ketones (cellulose thinner, acetone, etc.).

The element must be cleaned at regular intervals. Especially the clamping slide and the housing have to be cleaned of swarf and other liquids.

In the case of heavy contamination, cleaning must be made at shorter intervals.

2.10 Service / maintenance service

1. In Germany
   Maintenance by manufacturer
   Please send the clamping system free of transportation charges.

   Maintenance at customer workshop:
   Please call maintenance service - information 12.3011.
   Service phone: 02733 – 281 150

2. Internationally

Please contact the HILMA-RÖMHELD general importer or your local dealer.

Proposal, tightening torques for screws of tensile strength 8.8, 10.9, 12.9

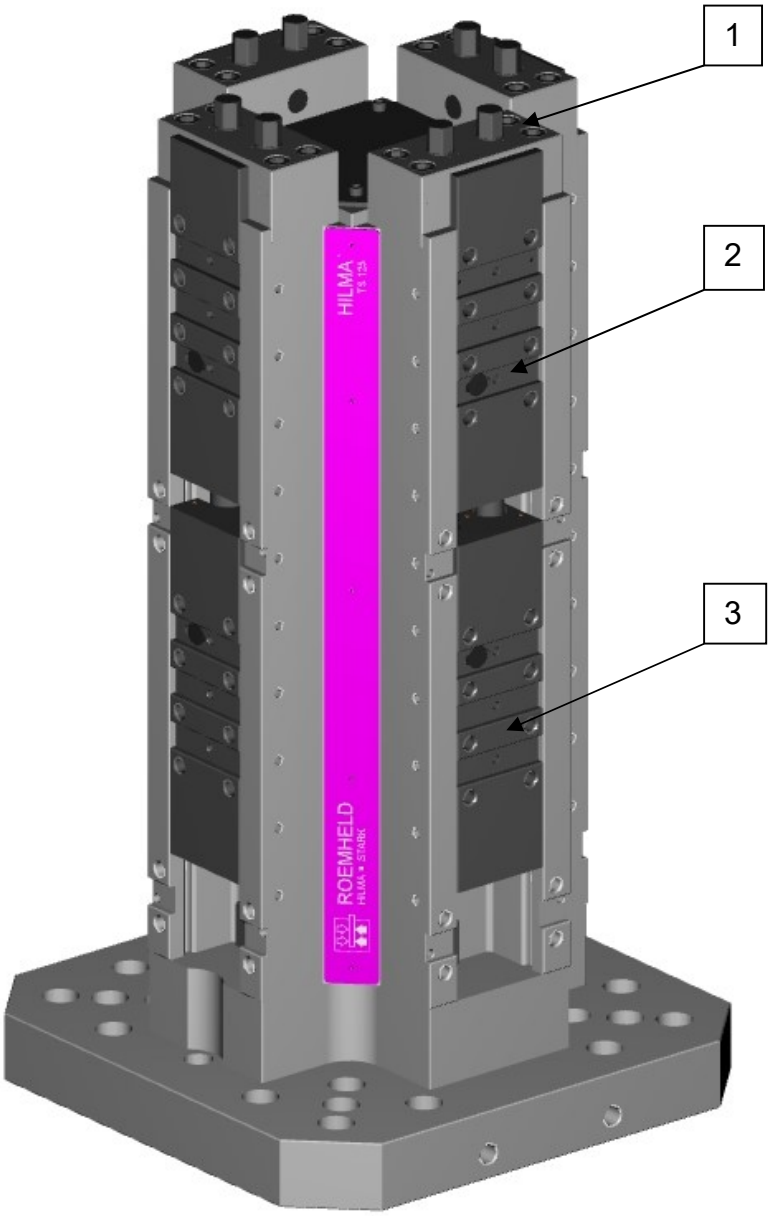
ⓘ NOTE

- The indicated values are approximate values and have to be interpreted according to the user's application!
  See note!

Thread	Tightening torque (MA) [Nm]		
	8.8	10.9	12.9
M6	10	15	18
M8	25	36	45
M10	49	72	84
M12	85	125	145
M14	135	200	235
M16	210	310	365
M20	425	610	710

Note: Applicable to workpieces and set screws made of steel with metric thread and connecting surface dimensions as per DIN 912, 931, 933, 934 / ISO 4762, 4014, 4017, 4032
The tightening torque (MA) values in the table take account of:
Steel/steel design, friction value μges = 0.14 - not lubricated, utilisation of minimum yield point = 90%.

2.11 Spare parts



Clamping system	Adjustment unit	Slide unit top	Slide unit bottom
TS 100 Vector	7.3395.0001	7.3395.0002	7.3395.0003
TS 125 Vector	7.3396.0001	7.3396.0002	7.3396.0003

3.1. Disposal

Hazardous to the environment
In order to avoid potential environmental damage, the individual components have to be disposed of by approved expert companies.

All materials have to be disposed of in compliance with the applicable codes and regulations as well as environment protection regulations.
Particular importance is to be attached to the disposal of components containing residues of pressure liquids. The notes regarding disposal in the safety data sheet have to be observed.
As regards the disposal of electrical and electronic components (e.g. stroke measuring systems, proximity switches, etc.) the country-specific statutory requirements and regulations have to be complied with.

3.2 Declaration of incorporation

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They are designed and manufactured in line with the relevant versions of the directives **2006/42/EC** (EC MSRL) and in compliance with the valid technical rules and standards.
In accordance with EC-MSRL, these products are components that are not yet ready for use and are exclusively designed for the installation in a machine, a fixture or a plant.

According to the pressure equipment directives the products are not to be classified as pressure reservoirs but as hydraulic placing devices, since pressure is not the essential factor for the design, but the strength, the inherent stability and solidity with regard to static or dynamic operating stress.

The products may only be put into operation after it was assessed that the incomplete machine / machine, in which the product shall be installed, corresponds to the machinery directives (2006/42/EC).

The manufacturer commits to transmit the special documents of the products to state authorities on request.
The technical documentation as per appendix VII part B was prepared for the products.

3.3 List of the used standards

Product Safety Act - ProdSG; November 2011

DIN EN ISO 12100, 2011-03, Safety of machinery; Basic concepts, General principles for design (replacement for part 1 + 2)
DIN EN ISO 13857; 2008-06, Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs. (replaces: DIN EN 294)
DIN EN 349, 2008-09, Safety of machinery - Minimum gaps to avoid crushing of parts of the human body
DIN EN 81714-2, 2007-08, Design of graphical symbols for use in the technical documentation of products
DIN EN 82079; 2010-10, Preparation of instructions, structuring, content and presentation - Part 1

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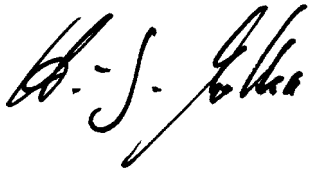

Hilchenbach, Nov 30, 2018