HEINRICH KIPP WERK

OPERATING INSTRUCTIONS

TOGGLE CLAMP

with force sensor

Edition 19 04

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As of: 26.03.2019

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1.1 General

Read carefully through these operating instructions before using the toggle clamp with force sensor K1463.

These operating instructions contain important information about how to handle the device. To ensure safe working, follow all the safety information and handling instructions.

Accident prevention regulations and general safety regulations applicable to the area of application of the device must be observed.

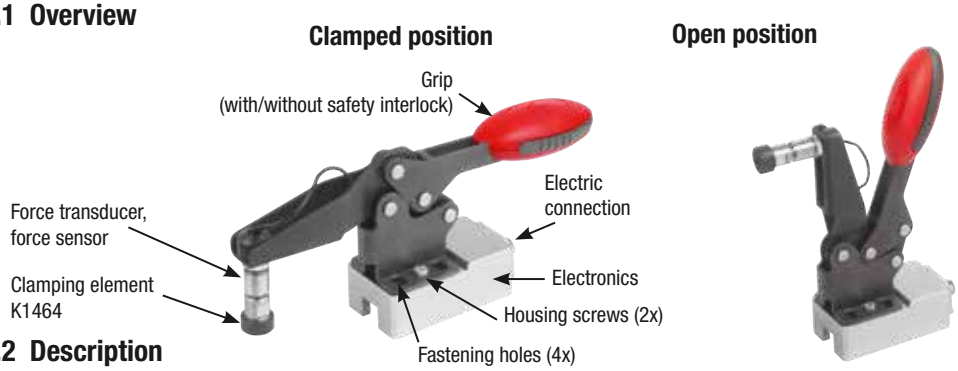
These operating instructions are an integral part of the product and must be made available to operating personnel at all times.

The general terms and conditions stated in the sales documentation apply.

The utilisation of the toggle clamp with force sensor is the responsibility of the user. HEINRICH KIPP WERK GmbH & Co. KG will not in any circumstances be responsible for any type of damage regardless of how this damage is caused.

Subject to technical modifications.

2.1 Overview



2.2 Description

Toggle clamps are used to hold and clamp workpieces. They are used as assembly and holding fixtures.
The toggle clamp with force sensor also enables measurement and adjustment of the holding force. So workpieces can be defined and the holding force recorded.

During the clamping operation, the clamping element K1464 presses on the workpiece and transmits the resulting compressive force on the threaded pin to the force sensor. The sensor contains strain gauges which generate an electrical signal based on the elastic deformation of the measuring arrangement. This is converted by the electronics into a standard output signal which is transmitted to the electrical terminal. The output signal can be individually processed by the user.

Clamping element K1464 is used to adjust the retaining force. Clamping elements with different heights are available for workpieces with different thicknesses.
Fine adjustments can also be made over the threaded pin.

2.3 Supplied with

1. Toggle clamp with force sensor
2. Clamping element set K1464
3. Operating instructions
4. Transport box with padding

3.1 Legend of icons

WARNING!
…indicates a possibly dangerous situation which can cause serious or fatal injury if not avoided.

CAUTION!
…indicates a possibly dangerous situation which can lead to slight or minor injury, or damage to property or the environment, if not avoided.

INFORMATION
…gives useful tips and recommendations, and information to help you achieve efficient and trouble-free operation.

3.2 Intended use

The toggle clamp with force sensor is intended for clamping or fixating workpieces with a defined static thrust force.

The force transducer has been constructed and tested according to the safety regulations for electronic measurement devices. Correct function and operating safety can be guaranteed only if the information given in these operating instructions is applied. When used, the legal and safety regulations required for the respective application must also be observed (e.g. VDE 0100). These also apply to the use of accessories.

The toggle clamp with force sensor is not intended for safety relevant functions.

The correct and safe operation of this device depends on proper shipment, storage, setup and assembly, as well as careful operation and maintenance.

This device has been designed and constructed exclusively for the purpose described here and must only be used for that purpose. The technical specifications given in these operating instructions should be observed. Incorrect handling or operation of the device outside of the technical specifications can lead to damage or malfunctions.

WARNING!
Injuries caused by incorrect use

Incorrect use of the device can lead to dangerous situations and injuries.

- Never make unauthorised modifications to the device.

Handle electronic precision measuring devices with the required care (protect from moisture, impacts, strong magnetic fields, static electricity and extreme temperatures). Protect plugs and sockets from dirt.

Any application of the device other than its intended use, or any other type of application, is considered improper use.

3.3 Operator responsibility

This device is intended for use in industrial applications. The operator is therefore subject to the statutory obligations of work safety.

The safety instructions included in these operating instructions, and the regulations on accident prevention and environmental protection must be followed.

The type plate must readable at all times.

To work safely with the device, the operator must ensure that:

- all qualified electricians are regularly instructed on all matters concerning safety at work, first aid and environmental protection, and that they know the operating instructions and are familiar with the safety instructions contained in them.
- the device is suitable for the application intended.

3.4 Personnel qualifications

WARNING!
Risk of injury due to insufficient qualification

Incorrect handling can lead to serious injury or material damage.

- The actions described in these operating instructions may only be carried out by qualified personnel who hold the qualifications described.

Qualified electricians

With their technical training, knowledge and experience, and knowledge of the country-specific regulations, applicable standards and guidelines, qualified electricians must be in a position to carry out work on electrical systems and be able independently to identify and avoid the possible hazards. Electricians must have been specially trained for the work environment in which they are employed, and must know the related standards and regulations. Qualified electricians must meet the requirements of the applicable statutory regulations on accident prevention.

Operating personnel

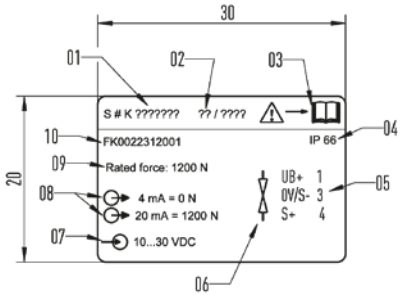
Operating personnel must never work on the electrical equipment of the toggle clamp unless they are qualified electricians.
The permitted actions of the operating personnel consist in operating the toggle clamp for production purposes.

3.5 Protective equipment

No specific protective equipment is required in order to operate the toggle clamp.

Any protective equipment required will be determined by the ambient and application conditions at the place of use, and other products or combinations with other products.

3.6 Type plate, safety marking



1. Serial number
2. Year of manufacture (CW/YEAR)
3. Symbol: read the operating instructions before commissioning
4. Protection class
5. Terminal assignment
6. Direction of force
7. Auxiliary power
8. Output signal
9. Nominal load Fnom
10. Type number

4. Transport, packaging and storage

4.1 Transport

Inspect the toggle clamp with force sensor and the supplied accessories for possible transport damage. Report any visible damage immediately.

CAUTION!
Damage caused by improper transport

Improper transport can cause a considerable amount of material damage.

- Take care when unloading the packages at delivery and during internal transport and pay attention to the symbols on the packaging.
- For internal transport, read the instructions in the section on "Packaging and storage".

Always handle the toggle clamp with force sensor with care. In particular, hard knocks against the device during transport can cause permanent damage which will affect measurement results.

4.2 Packaging and storage

The packaging provides optimal protection for the device. Therefore, take the toggle clamp out of its packaging only immediately before assembly. We also recommend conserving the packaging for e.g. placement changes or shipment for repair.

Permitted conditions at storage point:

- Storage temperature: -20 to +60 °C
- Humidity: 35 to 85% relative humidity (no condensation)
- Protected from dust and dirt, and mechanical vibrations

5. Commissioning, operation

- The electronics housing can be rotated through 90° by loosening the two housing screws. Afterwards, tighten the screws again.
- Mount the toggle clamp by screwing the fastening screws into 4 tapped holes.
- The contact surface between the toggle clamp and the mounting surface must be level and clean.

CAUTION!
Damage to the device caused by incorrect use

Torsional torque, off-centre loads and transverse forces will cause measurement errors and cause lasting damage to the force transducer.

- When installing, take care to ensure that the toggle clamp is installed in the open position.
- When mounting and adjusting the clamping force and the point of force application, take care to ensure that the force transducer is not subjected to transverse or torsional forces.
- Therefore, all nuts and other fixtures on the force transducer must be tightened only in the open position.
- Loads acting on the load transducer must act in the direction of force.

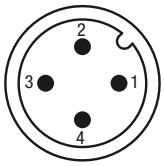
- Overloading must be prevented at all times.
- The output signal is stated on the type plate.
- The terminal assignments are also indicated on the type plate and in the section on "Electrical connections". Always pay attention to the correct polarity.

5.1 Electrical connections

To avoid coupling faults, pay attention to the following:

- Use a shielded low-capacitance measurement cable.
- Ground the shielded measurement cable on one end.
- Do not lay the measurement cable parallel to high current cables and control lines.
- Report stray fields from transformers, motors and contactors.
- Force transducer, amplifier and processing/display unit must be earthed at the same point. No differing potentials must be used.

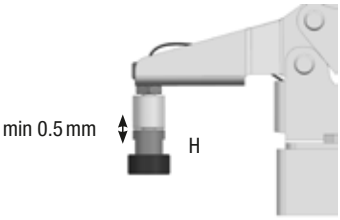
The connector terminal assignments indicated on the type plate.
Unless otherwise agreed, the following terminal assignments are made as standard:

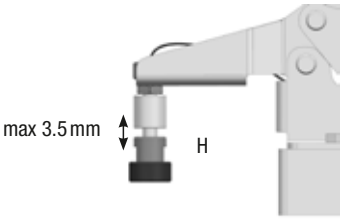


Connection 1	UB+	Supply voltage
Connection 2	-	-
Connection 3	0V/S-	Supply voltage and sensor signal -
Connection 4	S+	Sensor signal +

5.2 Adjusting the thrust force and force application point

The thrust force of the toggle clamp depends on the workpiece being clamped, the height H of clamping element K1464 and its screw-in depth on the threaded pin of the force sensor (see diagram).



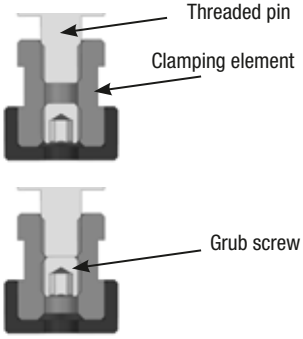


CAUTION!
Damage to the device caused by incorrect use

Torsional torque, off-centre loads and transverse forces will cause measurement errors and cause lasting damage to the force transducer.

- Adjustments must be made with the toggle clamp in the open position.
- All nuts and other fixtures on the force transducer must be tightened only in the unclamped i.e. open position.

Adjusting the thrust force

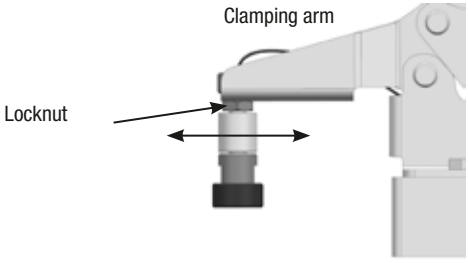


1.
Set the clamping element to the desired height.
Pay attention to the screw-in depth on the threaded pin!

2.
Screw in the grub screw up to the flat surface of the threaded pin and tighten.

Adjusting the force application point

The force application point can be changed by moving the force sensor along the clamping arm. To do this, loosen the locknut with the toggle clamp in the open position, move the force sensor; re-tighten the locknut.



1. Loosen the locknut
2. Move the force sensor
3. Tighten the locknut

INFORMATION
Force transmission in the force sensor

By design, force must always be transmitted through the threaded pin of the force sensor.
If the surface of mounted parts are in contact, measurements will be distorted.

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6.1 Maintenance

This device is maintenance-free.

We recommend having the force sensor regularly inspected for correct function by the manufacturer. Repairs must be carried out only by the manufacturer.
Contact details can be found in the "Service" section.

6.2 Cleaning

Disconnect the toggle clamp from the power supply before cleaning.

Clean the toggle clamps and force sensor with a cloth.
Keep any moisture away from the electrical connections!

CAUTION!
Damage to the device

Incorrect cleaning can cause damage to the device!

- Do not use aggressive cleaning agents.
- Do not use hard or pointed objects for cleaning.

7. Dismantling, return and disposal

7.1 Dismantling

This device is maintenance-free.

- Set the toggle clamp in the unclamped (open) position.
- Disconnect from the power supply.
- Remove the connecting cable.
- Unscrew the toggle clamp from its mounting location.

7.1 Return shipment

When shipping the device, please note:
all devices delivered to HEINRICH KIPP WERK must be free of hazardous substances (acids, alkalis, solutions etc.) and must therefore be cleaned before shipment.

We recommend using the original packaging for return shipment of the device. Otherwise, use suitable transport packaging.

To avoid damage:

- Pack the device into antistatic plastic film or place in an antistatic carton.
- Provide sufficient padding inside the packaging.
- Identify the transport package as containing a highly sensitive equipment.

Before shipment, always inform your contact person. The address for return shipment can be found in the "Service" section.

7.3 Disposal

Incorrect disposal may cause a risk of damage to the environment. Protect the environment by disposing of device components and packaging materials in accordance with the country-specific waste management and disposal regulations.

Do not dispose of the device as household waste.
Ensure separate disposal in accordance with national regulations.

8. Technical data

Force sensor:
Nominal force Fnom: holding force F4
Calibration range: 0 - holding force F4
Overall system accuracy: 5% Fnom
Limit force FL: 120% Fnom
Breaking force FB: >200% Fnom
Nominal temperature range B T,nom: -20 - + 60°C
Amplifier electronics:
Operating voltage: 10 - 30 V DC
Output signal (rated value) Cnom: 4 - 20 mA 3-wire
Permitted load: <(Ub- 10V)/0.024 A
Electrical connection: M12x1
Terminal assignments:
1: UB+
2: -
3: 0V / S-
4: S+
Rating: IP66

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