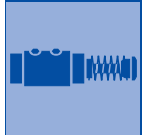
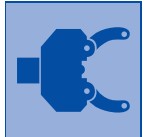
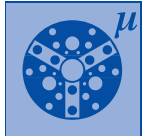
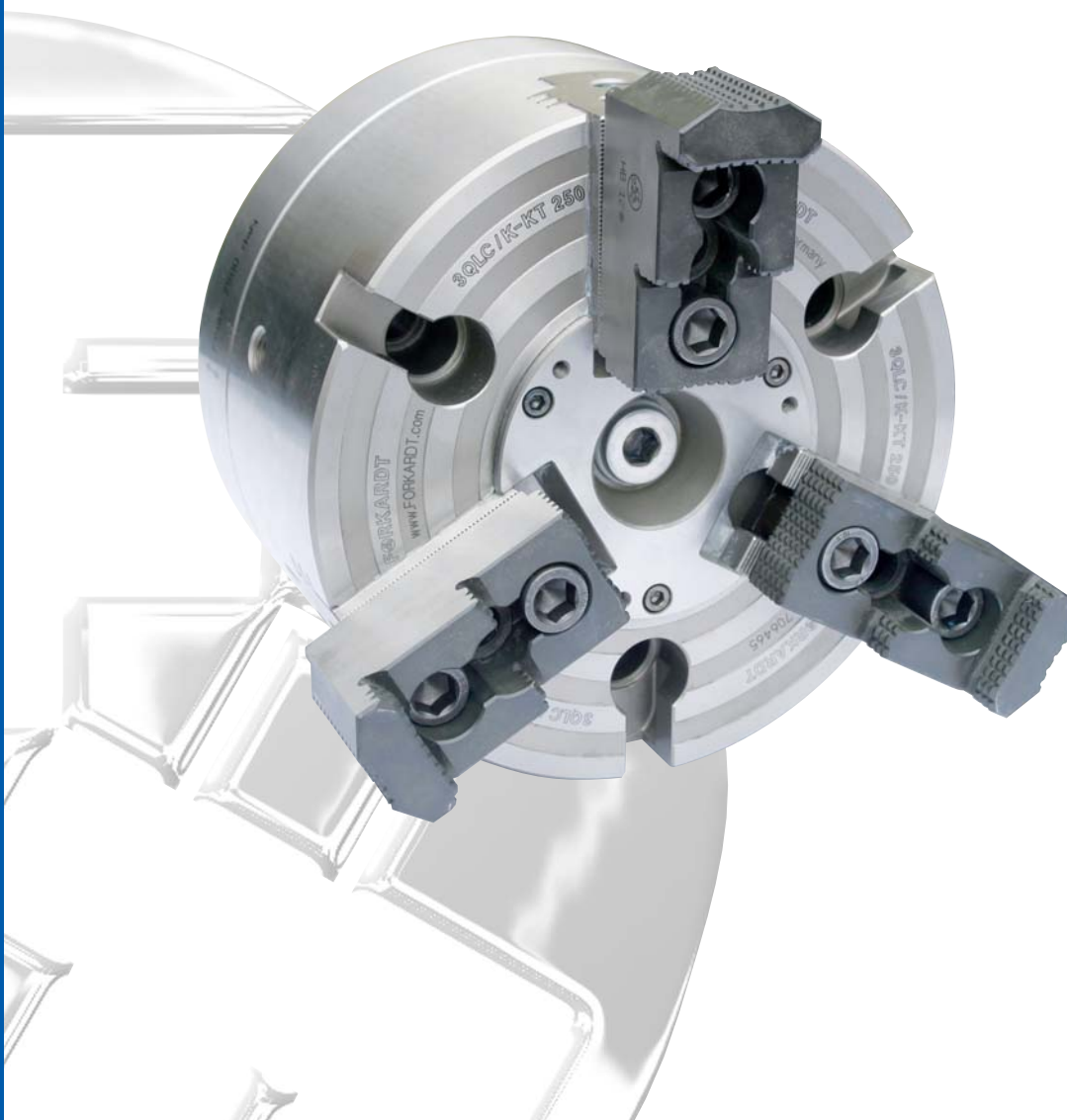


FORWARDT

3QLC-KT POWER CHUCK



ENGLISH

OPERATING INSTRUCTIONS

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1.0 General information on documentation

This user manual contains the essential information for the proper use of the clamping device. It is addressed to technically qualified people.

Qualified people are:

- those who have received instruction on using the clamping device.
- those who have received training on setting up and repairing clamping devices, and work as repair and servicing staff.



For the operation, maintenance and repair of the clamping device it is essential that the information in this manual is read and understood.

We reserve the right to make technical changes to the descriptions and statements in this instruction manual that are essential to improve the clamping device.

The manual may not be copied, disseminated or used for competitive purposes in full or in part.

The copyright for this manual belongs to FORKARDT DEUTSCHLAND GMBH.

1.1 Explanation of the symbols

Safety advice to prevent danger to life or reduce damage to property is shown in this manual by the symbols and pictograms indicated here.



indicates potential risk. Death, severe physical injury or substantial damage to property may occur if the precautions are not undertaken or the safety advice not adhered to.



indicates important information on avoiding damage to property or undesirable operating states.



indicates information on handling or additional information.

2.0 General safety advice

2.1 General

Clamping devices may produce risks if the use and handling do not meet the requirements for safety technology. The clamping device is produced to the current state of the technology and is safe to operate. Even so this clamping device may produce risks if it is used improperly by unqualified people. The following information is to be used for personal safety and to prevent damage to the product described or the connected devices.



Read this manual before working with the clamping device and observe all safety information. Not adhering to the instructions contained in this manual may result in danger to life, severe personal injury or substantial damage to property.

- Only qualified people may work with the clamping device.
- It is not permitted to change or alter the clamping device yourself.
- Only use the clamping device when it is in perfect condition.
- Before working on the clamping device, switch the machine off and ensure it can not be switched on again.
- Only use original manufacturer components and spare parts. The warranty lapses if parts from other manufacturers are used.
- Before starting to use the clamping device check whether all protective devices have been attached.
- The "lathe – clamping device – work piece" system is primarily influenced by the work piece being produced, which may result in a remaining risk. The operator must assess the remaining risk.

The manufacturer is not liable for damage arising from not adhering to the manual.

2.2 Intended Use

The clamping device may only be used to clamp workpieces on machine tools. When doing so the maximum axial force, clamping force and revolutions of the clamping device may not be exceeded. The required clamping force must be determined for the application in line with the applicable technical rules (e.g. VDI 3106). If in doubt or if accessories are used that were not provided by the manufacturer, the manufacturer must approve or restate the thresholds.

The following must be considered:

- Variable adhesion coefficients between work piece and top jaw
- Relationship between clamping diameter and working diameter
- Size of cutting force on the cutting tool
- Top jaws overhang from the clamping location

- Reduction in clamping force via the centrifugal force for external clamping
- The maximum revs stated only apply to hard standard top jaws
- For special top jaws that are to be used for this chuck the maximum revs are engraved on the jaws

Proper use includes adhering to the manufacturer's prescribed assembly, set-up, operation and maintenance terms. All other uses are considered to be unauthorised.

The manufacturer is not liable for damage thus caused.

2.3 Transport, handling and storage

Notify the forwarder if there is transport damage. Notify the manufacturer in writing without delay if parts are missing. If the clamping device is not assembled immediately after delivery it must be stored in a protected location. Cover the parts properly and protect from dust and moisture.

In order to protect all the blank parts, the clamping device and pressure oil cylinder, and all accessories are covered with a protective substance on delivery.

2.4 Operating information

As per the regulations of the trade association, revolving clamping devices must be secured from touching using appropriate covers or protective doors.



If faults occur on the clamping device during operation, the machine must be switched off immediately and only restarted when the fault has been resolved.

After switching off the clamping power the work piece may release itself from the clamping device.

The local safety regulations and accident prevention rules of the appropriate trade association apply to operating the clamping device.

2.5 Maintenance and repair

For maintenance and monitoring work ensure the clamping device is without pressure.

At the high revs that are common on lathes, the clamping device is exposed to high loads. It can be damaged during collisions between the tool and clamping device that may occur occasionally, e.g. if the program process has faults damage may occur.



After a collision switch off the lathe immediately and check the clamping device for damage. In addition to easily recognised damage, hidden damage may also occur, e.g. hairline fractures in the chuck body or the base jaws. Remove the clamping device immediately from the machine spindle.

Analyse the affected parts of the clamping device with an appropriate, non-destructive testing procedure to ensure there are no fractures and exchange it if damage has occurred.



Only use original parts.

2.6 Safety technology conditions for clamping devices

The safety technology conditions for operating clamping devices under pressure are defined in the trade association's testing guidelines and the DIN, VDE and VDI guidelines. The individual test conditions are ensured via the following activities:

Test condition	Ensured via:
The machine spindle may only start when the minimum clamping pressure in the clamping cylinder has been built up.	Pressure switch in the clamping lines
The machine spindle may only start if the jaw stroke clamping is in the permitted range.	Clamping route monitoring on the actuating cylinder
The clamping may only be released when the machine spindle has stopped.	Standstill monitoring on the machine spindle
If the clamping energy fails the work piece remains clamped until the spindle stops.	Unlockable non-return valve in actuating cylinder
If the power fails and restarts the switching positions do not change.	Impulse-controlled way valve with detent end positions
If the clamping energy fails, a signal to automatically or manually stop the spindle is given. At 1/5 of the maximum activation power the clamping device used must open and close.	Pressure switch in the clamping line

3.0 Set up and function

3.1 Clamping device components

Please see the enclosed assembly drawing and the corresponding parts list.

3.2 Function

The power chuck QLC-KT was developed especially for the fabrication of mass production components with high rotational speeds.

The connection of the chucking system and the work piece is actuated by gravity, i. e. the transmission of power goes on by pressing of the clamping jaws (base jaws with top jaws) to the work piece.

Rotating workholding systems are subject to the influence of the centrifugal force, which increases with the square of the rotational speed. The centrifugal force counteracts the clamping force in case of O. D. clamping, in case of I. D. clamping it is just the contrary.

The mounting of centrifugal weights behind the base jaws reduces the centrifugal force and accordingly a higher speed is achieved.

The operation pressure at the hydraulic aggregate has to be set up in a way, that the maximum actuating force of the clamping unit will not be exceeded.

4.0 Assembly



On assembly only use screws of the strength class 10.9! Only the indication of another strength class on the drawing (see enclosure) would be an exemption.

On assembly please pay attention to the following instructions:

- When assembling the base jaws note the markings 1, 2, 3 on the chuck body (guides) and on the base jaws. Place base jaw 1 in the relevant guide 1 on the clamping device etc.
- Observe the locked torques for the screws. (Specifications from the screw manufacturer).
- Unfasten the lock screw from the chuck cover (standard version) or unscrew the complete chuck cover (special version).
- Fasten the chuck on the spindle.
- Bolt down the draw bar with the central screw in the piston.
- Align the clamping device with a dial gauge so that after assembly the stroke on the test surfaces of the clamping device does not exceed a value of 0.01 mm.
- Tighten chuck fixing screws with a torque wrench in a clockwise direction.
- Check the jaws and piston stroke for the clamping device used. (Refer to list).
- Measure the clamping power when the clamping device is stopped using a static clamping force measuring tool, e.g. FORKARDT SKM 1200/1500, and compare it with the value stated on the chuck.
- At 1/5 of the maximum actuating force the clamping device used must open and close.

4.1 Fixing the top jaws

When fixing the top jaws on the base jaws, note the 1, 2, 3 marks on the base jaws or related guides. Fix top jaw 1 to base jaw 1 on the clamping device etc.

5.0 Commissioning

- Check all visible bolted joints to ensure that they are tight. Check all pressure oil, leakage oil and other pipes to ensure they are assembled and connected properly.
- Check operating and working pressure.
- Close protective door, start machine, allow machine spindle to operate.
- Carry out clamping device idle stroke to distribute lubricating grease and check the operation of the clamping device.
- Start machine, wait for the authorisation to switch on the machine spindle, as per the machine programme.



The precision of the clamping device is indicated when the work piece is clamped repeatedly and its movement is accurate.

5.1 Clamping force

The pressure required to produce the actuation is called the clamping force. The force available on the clamping jaws (base jaws with top jaws) at high spindle speeds varies with the level of clamping force available at standstill, the weight of the top jaws and their gravity radius.

The stated max. clamping force can only be achieved under the following conditions:

- Perfect condition of the clamping device
- Optimal lubrication of all sliding surfaces
- Maximum actuating force - Short top jaws overhang
- Standstill $n = 0$ (or low revs)

The clamping force at standstill is measured using a static clamping force measuring device, e.g. SKM 1200/1500.

Check or calculate whether the clamping force of the clamping device is adequate for working under the selected operating conditions.

If the clamping device rotates, the operating clamping force can be determined with a dynamic clamping force measuring device, e.g. FORSAVE D.



5.2 Commissioning after longer breaks

- Set operating and work pressure on the hydraulic motor.
- Carry out clamping device idle stroke to distribute the lubrication grease.
- Activate clamping cylinder several times (back and forth) to vent the system.

- Check clamping force at standstill on the clamping device with clamping force measuring device, e.g. z. B. FORKARDT SKM 1200/1500.
- Insert work piece and start clamping.
- Check function as per function process.
Check clamping and release functions.
- Check electric switches.
- Start operation.

6.0 Maintenance and repair

6.1 Maintenance

Because of the various operational relationships it is not possible to determine in advance how often maintenance, wear monitoring and servicing are required.

This must be stipulated according to the level of the load and pollution.

Approximate values

Operating hours/period	Control site/maintenance information
After 24 hours; when commissioning or repairing.	Carry out idle stroke to lubricate the clamping device. Check the screw connections to ensure they are firm.
Weekly	Check clamping force at standstill with a clamping force measuring device, e.g. FORKARDT SKM 1200/1500.
Weekly	Check operation of clamping device. Lubricate the clamping device via the lubrication nipple in the base jaws with the stipulated lubrication grease.
If the clamping force or precision is unusually low.	Check the base jaws, chuck piston and setting lever for wear or pollution.

6.1.1 Balancing

The clamping device is dynamically balanced, whereby the imbalance is balanced by screwing in balancing weights into the chuck body and adhering to balancing rating $Q = 6.3$ in line with VDI 2060.

6.1.2 Disassembling the clamping device

Place clamping device onto a palette or work bench and disassemble the individual parts as described below.

- Remove cylinder screws from the chuck body thread.
- Pull out chuck flange with the centrifugal weights from the chuck body centring hole and remove from chuck piston.
- Pull out complete chuck piston with setting lever from the hole or the chuck body and base jaw recesses.
- Pull out base jaws from the chuck body guides.

Check all parts for damage and clean them. Replace defective parts, lubricate and reassemble. If fixing screws have to be exchanged, use the same dimensions and quality.

When inserting the base jaws in the chuck body guides, note the markings. Insert base jaw 1 into chuck body guide 1 etc.

7.0 Troubleshooting



The following table lists the actions required to resolve various problems with the clamping device.

Restart the device after troubleshooting as per the information in the "Commissioning" chapter.

Problem	Possible cause	Actions
The lathe vibrates strongly.	Cylinder flange or intermediate flange imbalance Clamping cylinder or device imbalance as a result of incorrect assembly.	Check clamping cylinder and clamping device rotation and correct if necessary.
Clamping force is too low.	Contamination Inadequate lubrication	Lubricate or disassemble, clean, lubricate and reassemble.
The rotation error (for the ground out) top jaws is too large.	Top jaws were exchanged, possibly also the base jaws.	Check and change if necessary.
The piston stroke is not reached.	Connecting rod installed incorrectly.	Check the installation of the connecting rod.

8.0 Spare parts



For reasons of safety and for the proper functioning only use original FORKARDT parts.

Refer to the component list for the item numbers.

Manufacturer's warranty only for FORKARDT original parts.

There is no product liability for damage incurred as a result of using third party parts in our products.

8.1 Customer service

To order spare parts, please state the following information:



Name
Quantity
Ident. number

FORKARDT


2155 Traversefield Dr
Traverse City, MI 49686

Phone: 800-544-3823
Email: sales@forkardt.us
Website: www.forkardt.com

9.0 Manufacturer's Declaration

In line with EC Machine Directive 2006/42/EG, and their current change guidelines (observe date of issue).

We hereby declare that this shipment is the machine part listed below and is designed to be installed into a machine. It's use is not permitted until it can be determined that the machine into which it is installed has met the requirements of the EC Directive.

Name:	Power-operated three jaw chuck
Type:	QLC-KT
Harmonised standards used, depending on product:	DIN EN ISO 12100-1, DIN EN ISO 12100-2, DIN EN< 414, DIN EN 418, DIN EN 457, DIN EN 60 204-1
National standards and technical specifications used, as appropriate:	Test Guidelines GS-EM No. I / 2 - 50 of the Iron and Metal II Trade Association
Date / Manufacturer's signature:	04.03.2009  (Head of Design Mr. Hildebrandt)

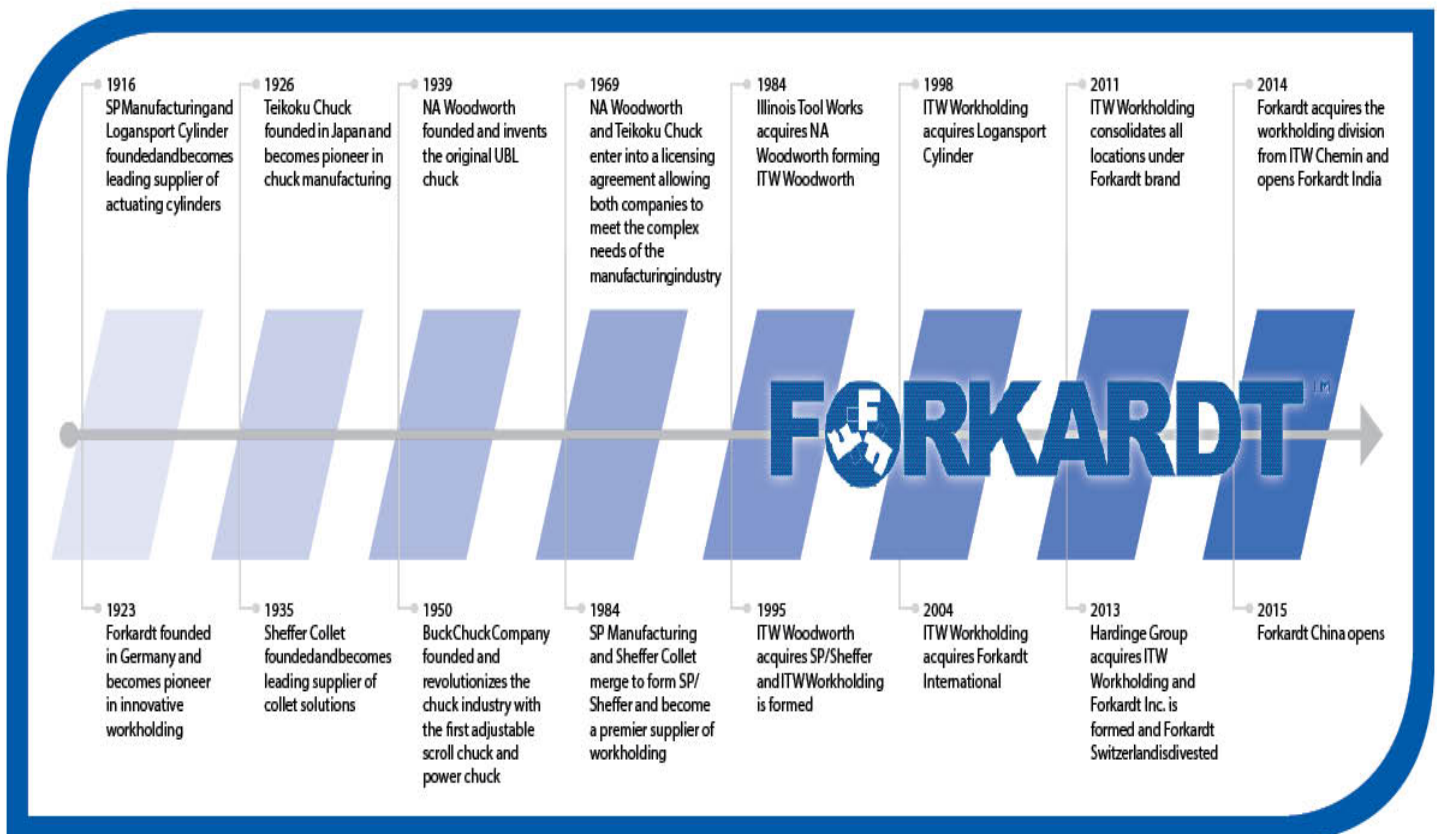
This declaration loses its validity if the components of the product are changed or dis-assembled without our express permission.

Manufacturer's Declaration No.: 3QLC-KT.E

As we are constantly improving our products the measurements and statements may not always apply to the latest designs; they are therefore non-binding.



OUR HISTORY



Innovative Technology by **FORKARDT**

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