Total Gear Solutions Gleason

en

Operating manual
Workholding Translation

Quik-Flex® Plus
Size 155, 185, 275

Document No.: 10000153822

Content

1 Introduction

1.1 General information regarding the manual

Scope of the manual

This manual applies exclusively to the clamping device Quik-Flex® Plus of types QFP 155, 185, 275.

Point of use

This manual must be available to the personnel in the immediate vicinity of the clamping device, kept in safekeeping for the entire service life of the clamping device and passed on to every subsequent owner.

The manual contains important information regarding the safe and proper operation of the clamping device. Everyone who works at/with the clamping device must read and observe the manual before beginning work. For information regarding the necessary qualifications of the personnel, see Chapter 2 – Personnel qualifications.

Figures

The figures in this manual serve the basic understanding and may be different from the actual implementation of the clamping device.

Copyright

1.2 List of abbreviations

Abbreviation	Explanation
QFP	Quik-Flex® Plus
mm	Millimeter
µm	Micrometer
kg	Kilogram
N	Newton
daN	Decanewton (1 decanewton is equivalent to 10 newtons)
Nm	Newtonmeter
rpm	Revolutions per minute

1.3 Depiction of the warning notices

This manual contains warning notices indicating actions for which there is risk to persons and property damage. The described measures for hazard avoidance must be adhered to.

Warning notices are structured as follows:


Symbol

⚠ SIGNAL WORD!

Type and source of the danger!

▲ Consequence if not observed.

➔ Avoidance, indicates how the danger can be avoided.

➢ Additional information.

1.3.1 Signal words

Signal words indicate the severity of the danger. The signal words and their meanings are listed below

⚠ DANGER!

This indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING!

This indicates potential danger which, if not avoided, will result in death or serious injury.

⚠ CAUTION!

This indicates potential danger which, if not avoided, can result in minor or moderate injuries.

NOTICE!

There is a situation requiring particular attention. Failure to observe may lead to property damage at the clamping device and in its surroundings.

1.3.2 Safety symbols

Explanation

The safety symbols used in this manual -

- identify obstacles and danger spots for life and limb of persons (warning sign, triangular+yellow),
- inform about the need to refrain from certain behaviors in order to avoid accidents (prohibition sign, round+ white-red), and
- point to personal protection equipment to be worn in order to avoid accidents or to mitigate their consequences (mandatory sign, round+blue).

The safety symbols must be absolutely and completely observed. In the case of non-compliance with one or more safety notices, no liability for personal or other damages is assumed.

Warning signs

	General warning sign.
	Warning of automatic startup.
	Warning of suspended loads.
	Warning of hand injuries.

Mandatory signs

	Follow instruction manual.
	Use foot protection.

	Use hand protection.
	Use eye protection.
	Wear hair net.
	Wear protective clothing.
	Secure machine against restart.

1.3.3 Information symbols

- ➔ Operating instruction / text and warning
- ↳ Consequence of the executed instruction
- ▪ Enumeration
- ➢ additional notes or cross-references to further explanations
- ▲ Consequence in warning notice

2 Safety

2.1 General instructions

Principle

The clamping device is constructed according to the state of the art and the recognized safety regulations. Nevertheless, when used, dangers may arise for the user or third parties or damage may be caused to the clamping device or other property. Therefore, observe the general, fundamental and special safety instructions with great care.

Rules and regulations

In addition, the binding rules on accident prevention and the recognized technical rules for safe and professional working that apply in the country of use and at the location of use must be observed.

Use

Only use the clamping device when it is in technically proper working condition and only according to its intended use. Take account of all safety concerns. In particular, any malfunctions or disruptions that affect the safety, must be eliminated immediately.

Changes/ Conversions

Make no changes, additions or modifications to the clamping device that could affect safety without the approval of the manufacturer! Unauthorized additions or conversions lead to the loss of guarantee and warranty claims.

Misconduct

Misconduct or misuse of the equipment can result in -

- Danger to the life and limb of the operator
- Damage of assets in the surrounding area
- Damages to the clamping device

Spare parts

Spare parts must comply with the technical requirements specified by the manufacturer. This is always guaranteed with original spare parts.

2.2 Intended use

Permissible Operation modes

The clamping device Quik-Flex® Plus of types QFP 155, 185, 275 is intended for clamping modular, workpiece-specific clamping devices for use in gear cutting machines. For this purpose, the clamping device is mounted on the machine table of the gear cutting machine.

The clamping device Quik-Flex® Plus is suitable for wet and dry machining in Gleason machines and machines from other manufacturers. The operating company is obliged to secure the danger spots resulting from the installation of the equipment in the gear cutting machine.

The clamping device may only be mounted, operated, serviced and cleaned by instructed and trained specialist personnel. The personnel must be familiar with the use and handling of the clamping device and be aware of possible dangers.

The clamping device may only be used in the commercial sector, i.e., in industrial spaces/industrial buildings.

The intended use also includes observing the operating instructions as well as the compliance with prescribed operating limits and maintenance conditions.

Inadmissible modes of operation

Operation of the clamping device is not permitted:

- Outside the operating limitations (see chapter 4 - Technical data)
- With tool-specific clamping devices that have not been approved by the manufacturer
- In gear cutting machines without closed guards (protective machine housing) and without activation via a safety circuit
- In case of obvious malfunctions and damage
- After unauthorized additions or conversions
- In case of contamination and/or foreign bodies which unduly impair safety and/or function
- If maintenance and checking intervals have been exceeded
- If technical characteristics have changed
- In case of improper assembly
- If operated at unsafe speeds or high loads
- If using emulsions for cooling which cause corrosion at the clamping device
- If operated with wear and spare parts not approved by the manufacturer

The clamping device must not be climbed or stepped on!

Lifting magnets must not be used for transport, assembly or disassembly of the clamping device!

Any other use is considered improper use and can lead to hazardous situations. The manufacturer is not liable for any damage resulting from this. The risk is borne solely by the user.

2.3 Residual risk

Due to the installation of the clamping device in a gear cutting machine the following residual risks arise:

2.3.1 Mechanical dangers

Sharp edges and pointed corners

Sharp edges and pointed corners on the clamping device could result in cutting injuries.

The clamping device may only be mounted, operated, serviced and cleaned by instructed and trained specialist personnel. The personnel must be familiar with the use and handling of the clamping device and be aware of possible dangers.

- ➔ When working with the clamping device, always wear safety shoes and protective gloves.
- ➔ Before working at the clamping device , the gear cutting machine is to be stopped, disconnected from the power supply and secured against being switched on again.

Falling parts

Improper use or incorrect handling can result in crushing, impact and cutting injuries if the clamping device falls or drops down.

The clamping device may only be mounted, operated, serviced and cleaned by instructed and trained specialist personnel. The personnel must be familiar with the use and handling of the clamping device and be aware of possible dangers.

- ➔ When working with the clamping device, always wear safety shoes and protective gloves.
- ➔ For heavy clamping devices (over 15 kg), also wear a protective helmet.
- ➔ For heavy clamping devices (over 15 kg), use lifting gear and fastening means with sufficient load capacity.
- ➔ Before working at the clamping device , the gear cutting machine is to be stopped, disconnected from the power supply and secured against being switched on again.

Ejected parts

During operation, parts of the clamping device can break and be ejected. Similarly, faulty mounting or incorrect handling can cause the clamping device or the workpiece to be ejected and thereby injure persons.

Only trained and instructed technical staff are permitted to perform work on the clamping device.

- ➔ Observe the application limits of the clamping device (see chapter 4 - Technical Data).
- ➔ The following protective measures are mandatory during operation of the clamping device in a gear cutting machine:
  - A closed machine housing of the gear cutting machine
  - Control via a safety circuit
  - Suitable speeds
  - Query of clamping path/clamping force
- ➔ Perform all maintenance and servicing work regularly and carefully in the specified intervals.
- ➔ Do not exceed the service life of the clamping device.
- ➔ Use only original spare and wear parts that are approved by the manufacturer.

Moving/rotating components

The following may occur at the clamping device while a gear cutting machine is running, in the event of an unexpected restart (during cleaning, servicing and maintenance) and if faults are not properly rectified:

- Body parts may be crushed, cut, severed, or impacted.
- Clothing, hair, and body parts may get caught, pulled in, or wound up.

In addition, hands or fingers can be crushed or struck by the stroke of moving parts in the clamping device while operating the clamping device.

The personnel must be familiar with the machine and know the possible dangers. Troubleshooting and fault rectification as well as maintenance, cleaning and servicing work may only be performed by trained and instructed specialist personnel.

- ➔ During operation, do not reach into or handle moving or rotating components.
- ➔ While working at the clamping device:
  - Wear tight-fitting work clothing
  - For long hair, a hair net is required
  - Wearing jewelry is not allowed

➔ Before troubleshooting and rectifying errors or during maintenance, cleaning and servicing work, stop the gear cutting machine in which clamping device is installed and disconnect it from the external power supply if applicable and secure it against accidentally being switched on again.

2.4 Obligations of the operating company

Danger point safeguarding

The facility operator is responsible for securing the danger points that result from installation of the clamping device into the gear cutting machine, as well as to observe, assess, and evaluate any new dangers that may occur when operating the clamping device.

In the event of a fault, bring to a standstill

The machine owner is obligated to use the clamping device only in a flawless condition. In the event of malfunctions or damage to the clamping device, the gear cutting machine in which the clamping device is mounted is to be brought to an immediate standstill and secured against being switched on again.

Determine and instruct responsible persons

Only persons who are familiar with the basic regulations on occupational safety and accident prevention as well as proper handling of the clamping device may be assigned to work with the clamping device.

Responsibilites of personnel for transport, assembly, conversion, maintenance, servicing, repair and troubleshooting must be clearly defined.

Duty to inform

Always store the manual within reach at the place of use of the clamping device.

The manual is to be expanded with instructions, including supervision and reporting duties that take into account operational features, e.g., regarding the organization of work, work sequences, personnel entrusted with the work.

After mounting the clamping device, the machine owner must determine whether it is necessary to attach safety symbols and to attach them if so.

Reasonable lifting and carrying forces

When transporting and working with the clamping device, the permissible values for acceptable lifting forces and load capacities must not be exceeded! Otherwise use suitable lifting equipment. (Do not use lifting magnets).

Age of person	Permissible load in kg			
	Frequency of lifting / carrying			
	Women	Men	Women	Men
	occasionally		more frequently	
15-18 years of age	15[1]	35[1]	10[2]	20[2]
19-45 years of age	15[1]	55[2]	10[2]	30[2]
Older than 45 years	15[1]	45[2]	10[2]	25[2]

- occasionally = max. twice per hour for up to four steps
- more frequently = more than twice per hour, or transport routes of more than four steps

[1] Limit values that normally must not be exceeded without health risks.

[2] Values recommended from an ergonomic point of view.

2.5 Obligations of the personnel

Work at the clamping device may only be performed by reliable, qualified and trained personnel. It is recommended that this knowledge is regularly supplemented and refreshed.

Persons assigned to work on the clamping device must have read the operating manual, particularly the chapter Safety, before undertaking to work on the system. Always observe safety and hazard warnings.

Ensure that only authorized personnel work at the clamping device. Personnel who are to be trained, instructed, or present within the scope of general training may only work with the clamping device under the constant supervision of an experienced person.

The general regulations regarding occupational safety and accident prevention apply to persons who work with the clamping device or who are present there, e. g., Wearing the specified work clothing (safety shoes, etc.).

The assigned personnel have an obligation to immediately pass on identified errors and damages on the clamping device to the relevant supervisor. Production must be suspended until the damage is repaired.

2.6 Personnel qualifications

When selecting personnel, observe the age and occupation-specific regulations applicable at the place of work.

Persons intended to perform work

Task	Responsible	Required personnel qualification
Transport	Manufacturer / operating company	Trained and instructed specialist personnel
Mounting, Removal	Operating company	Trained and instructed specialist personnel
Trouble-shooting, fault rectification	Operating company	Instructed specialist personnel staff with subject-specific training in mechanics or electrical engineering
Maintenance, servicing, repair	Operating company	Instructed specialist personnel staff with subject-specific training in mechanics or electrical engineering
Disposal	Disposal firm	Expert (specially trained personnel) from a certified disposal firm

Unintended persons/ personnel

For the following persons, additional safety measures must be taken if necessary, e.g., Supervision, keeping people away, etc.:

- Employees from the area
- External persons, e.g., visitors
- Children, adolescents
- General public
- Persons under the influence of alcohol, other drugs or medications that affect their ability to react

2.7 Personal protective equipment

Always to be worn

During work at the clamping device, the following personal protective equipment is always to be worn:

	Protection equipment	Description
	Safety shoes	With appropriate protective caps to protect against crushing.
	Hair net	For long hair to protect against catching/pulling in.
	Protective gloves	Wear protective gloves that are suitable for the respective task, e.g., while handling the clamping device or when working with hazardous materials, to protect against hand injuries.
	Protective clothing	Tight-fitting clothing with low tear resistance for protection against pulling in / catching.

➢ Wearing jewelry, ties, scarves, etc. is not allowed.

To be worn for special tasks

If necessary, e.g. when carrying out special work or as required by regulations, the following additional protective equipment must be used:

	Protection equipment	Description
	Safety goggles	If necessary, wear safety goggles for troubleshooting, fault rectification, servicing and maintenance to protect against flying parts and materials, as well as for handling hazardous substances.
	Hard hat	Wear a hard hat / safety helmet during transport activities to protect against head injuries caused by falling objects, and to protect against bumping on edges and protruding components.

2.8 Safety and protection devices

The clamping device itself has no safety and protective equipment to protect the personnel.

⚠ WARNING!

Danger of injury due to missing safety and protective devices of the gear cutting machine!

- ▲ Missing safety and protective equipment at the gear cutting machine in which the clamping device is installed could cause personal injury and property damage.
- ➔ Only operate the clamping device if the gear cutting machine is equipped with an enclosed machine housing.
- ➔ Periodically check the safe condition of the safety and protective devices. When safety and protective devices are missing, switch off the gear cutting machine immediately and secure against unintentional restart. Immediately report any damage found to the supervisor.
- ➔ Make sure that safety and protective devices are always accessible.

Even minor damage to the clamping device can compromise safety!

2.9 Safety during normal operation

Any working methods that might endanger safety are to be avoided. This includes, e.g., Operating the clamping device with unapproved, tool-dependent clamping devices or unauthorized conversions, climbing onto the clamping device, failure to observe safety instructions, etc.

Checking

Only operate the clamping device in a safe and functional state.

Only operate the clamping device if all safety and protective equipment of the gear cutting machine are present and functional.

Check for defects and damage at least once per shift; if necessary, bring the clamping device to a stop and immediately rectify damages (or have damages rectified)!

Make sure that the work area is always clean and tidy.

protection equipment

If necessary or if required by regulations, use personal protective equipment!

Securing

Before switching on/commissioning the gear cutting machine, ensure that no one can be endangered by the starting clamping device!

Malfunctions

In the event of malfunctions, immediately stop and secure the gear cutting machine in which the clamping device is installed! Have malfunctions rectified immediately!

Demagnetizing

Magnetic charge causes chips to adhere which leads to damage of the clamping device or the workpiece. The clamping device as well as all workpiece-contacting components must not exceed a magnetism of 5 gauss. Check the magnetic charge regularly every 4 weeks, and demagnetize if necessary.

Operating/auxiliary materials

The operating/auxiliary materials used for operation, servicing, maintenance repair or storage, such as oils, greases, can be harmful to health if handled improperly.

When working with hazardous or irritating materials, observe the safety regulations (manufacturer's safety notices and data sheets) that apply for the material as well as the hazardous materials instructions!

Put on necessary personal protective equipment such as protective glasses/ visor, respiratory protection, protective gloves and protective clothing!

Work may only be performed by trained and authorized personnel who have been instructed in the handling of hazardous substances.

Immediately remove any escaping auxiliary and operating materials as well as worn-out and used-up auxiliary materials and clean appropriately.

If unsuitable emulsions are used to cool components, the clamping device can corrode! Only use emulsions that do not cause corrosion at the clamping device.

2.10 Safety during special work

The term special work includes all activities of setup, cleaning, maintenance, servicing, repair as well as trouble-shooting and fault rectification.

Personnel qualification

This special work may only be carried out by trained and instructed specialist personnel with subject-specific training in mechanics or electrical engineering. A safe and error-free practice of these activities and interventions is only guaranteed if special expertise exists for these activities.

Prior to starting work

⚠ WARNING!

Risk of injury from automatically starting clamping device!

- ▲ An unexpected, automatically started clamping device could injure persons.
- ➢ The table of the gear cutting machine must be in closed-loop control for setting/setup work. The gear processing machine must only be operated at a safe speed.
- ➔ Prior to starting special work, point to the state with a sign displayed at all operating controls of the gear cutting machine!
- ➔ For cleaning, maintenance, servicing, repair as well as troubleshooting and fault rectification, the gear cutting machine in which the clamping device is installed must be disconnected from the power supply, depressurized and secured against being accidentally switched on again.

Inform the operating personnel prior to performing special work. Designate a supervisor!

Note the dates reserved for maintenance, cleaning and repair work.

Provide adequate workshop equipment.

Personal Protection equipment

Depending on the work to be performed, use appropriate personal protective equipment.

Cleaning

To prevent personal injury and property damage, the machine area around the clamping device and/or the clamping device itself should be properly cleaned before special work.

Auxiliary materials

The auxiliary materials used for cleaning, maintenance or repair, such as oils, greases, lubricants, cleaning agents and solvents, etc., can be harmful to health if handled improperly. When handling harmful substances, observe the safety regulations applicable to the product.

➢ For further information on working with the auxiliary materials, see also Safety during normal operation, Page 19.

After completion of work

After completion of the special work, tighten loosened screw connections again.

Before restarting:

- Make sure that no tools or other objects have been left on or in the clamping device.
- Make sure that collisions with other machine parts are prevented.
- Make sure that starting the clamping device will not pose a risk to any persons.

Perform function test and check whether the clamping device functions flawlessly and within the specified nominal values.

In the event of safety-relevant changes to the clamping device or its operating behavior, immediately stop the clamping device and report the malfunction to the responsible office/person!

Log the completed work in writing.

Disposal

Dispose of problematic and waste materials that are no longer usable, such as lubricants or cleaning agents, properly at the designated disposal points.

Ensure that oils, greases or other water-endangering substances do not enter the sewer system, surface water or groundwater. Binding agents must be kept ready.

Protect the environment

Comply with general and local environmental protection regulations. Observe environmental regulations (water, waste and immission control acts, and the Existing Substances Regulation for chemicals).

3 Transport

3.1 Safety instructions

⚠ WARNING!

Danger to life through suspended, overturning or falling loads!

- ▲ Moving loads can overturn, displace or fall down and as a result crush, injure or kill people.
- ▲ Uncontrolled suspended loads can crush, injure or kill people.
- ➔ Use only approved fasteners and lifting gear with sufficient load-bearing capacity.
- ➔ Do not use damaged loading straps or lifting straps!
- ➔ Fasten and secure loads properly.
- ➔ Do not step under or in front of moving loads.
- ➔ When transporting, pay attention to the position of the center of gravity of the load.
- ➔ Wear personal protection equipment such as safety shoes, protective gloves and hard hat.
- ➢ Only use qualified personnel who can prove that they are qualified to operate the transport aid used.

Failure to comply with the safety instructions and regulations can result in accidents at work.

- ➔ Observe the safety instructions and regulations.
- ➔ Comply with applicable accident prevention regulations.
- ➔ Check all work performed.

3.2 Delivery and unpacking

Scope of supply

Included in delivery of the Quik-Flex® Plus :

- clamping device Quik-Flex® Plus,
- Actuation wrench,
- Draw rod.

Check the scope of supply for completeness and damage. Damage due to defective packaging or transport must be notified immediately to the carrier, the insurance company and the manufacturer.

Unpacking

The clamping device is packed in the upright position. The packaging is intended to protect the clamping device against transport damage, corrosion and other damage until it is mounted. Therefore, do not destroy the packaging and remove it just before installation.

Please help to protect our environment! Dispose of packaging material in an environmentally friendly manner in accordance with the applicable legal regulations and local disposal regulations.

3.3 In-house transport

Means of transport

To lift the clamping device , a crane must be used for weights greater than 15 kg. Do not use lifting magnets!

In-house transport of the clamping device may take place with a transport trolley/crane. The load-bearing capacity of the means of transport must correspond to the weight of the load.

Dimensions and weight

For exact details on the weight and dimensions of the clamping device see chapter 4 - Technical data.

Transport with transport trolley

- ➢ When transporting with a transport trolley, the clamping device must be secured against tipping over or rolling off.
- ➔ Secure the clamping device with suitable tools.
- ➔ The transport trolley must be fitted with a non-slip underlay.
- ➔ Transport carefully and slowly.
- ➢ Do not move along downward sloping routes. Secure the transport trolley at standstill to prevent it from rolling away.

Transport by crane (from 15 kg)

- ➢ The clamping device is provided with threaded bore holes on the flat face for crane transport.
- ➔ Use suitable lifting attachments, e.g., screw load hooks (rotatable) into the intended thread of the clamping device.
- ➔ Hook in lifting attachments at the transport aids.
- ➔ Apply slight tension and check correct mounting position.
- ➔ Make sure that slipping and possible falling of the clamping device is not possible.
- ➔ Carefully lift the clamping device with the help of a crane and place it on a sturdy, level surface.
- ➢ Avoid jolts when setting down.

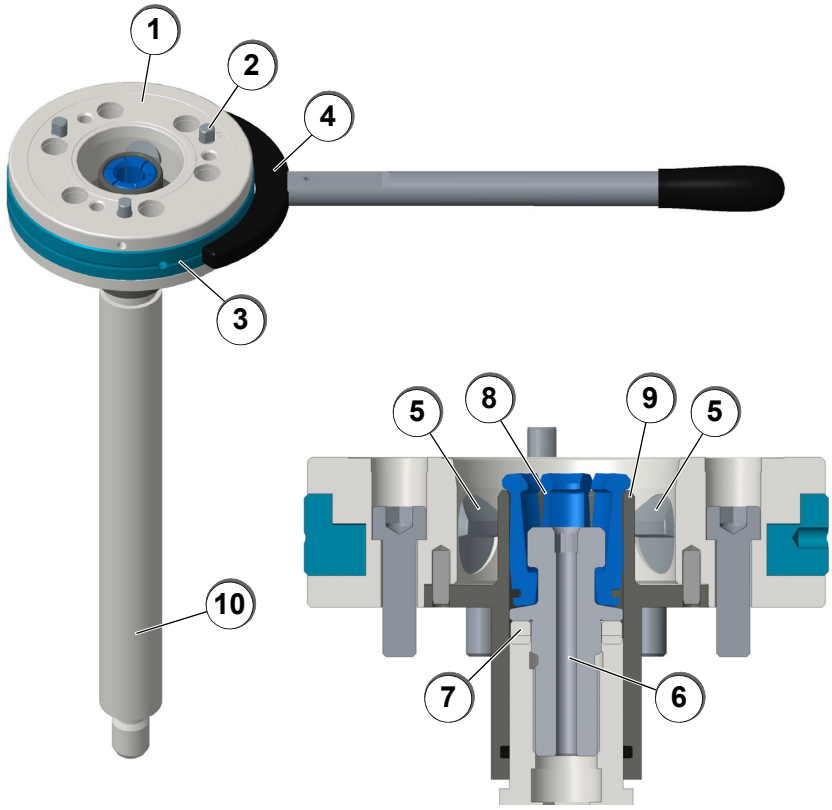
Transport routes

Routes, ramps and steps along the intended transport route must be prepared for transport, i.e. non-slip, without obstacles and well-lit. Ensure non-slip flooring through rough floor surfaces.

4 Description

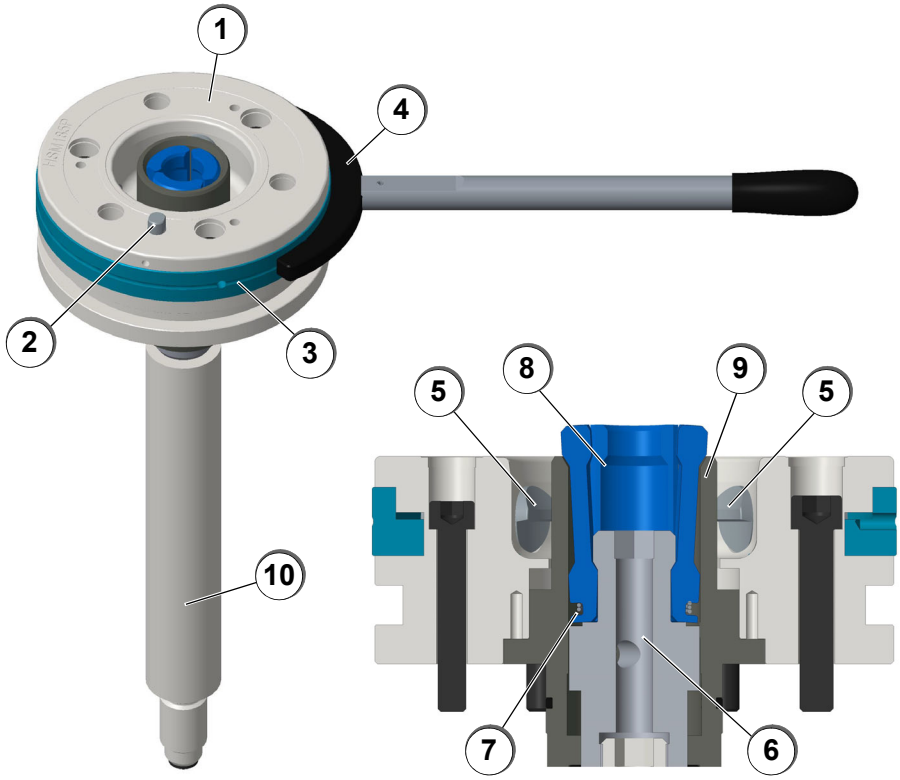
4.1 Construction and function

Type QFP 155



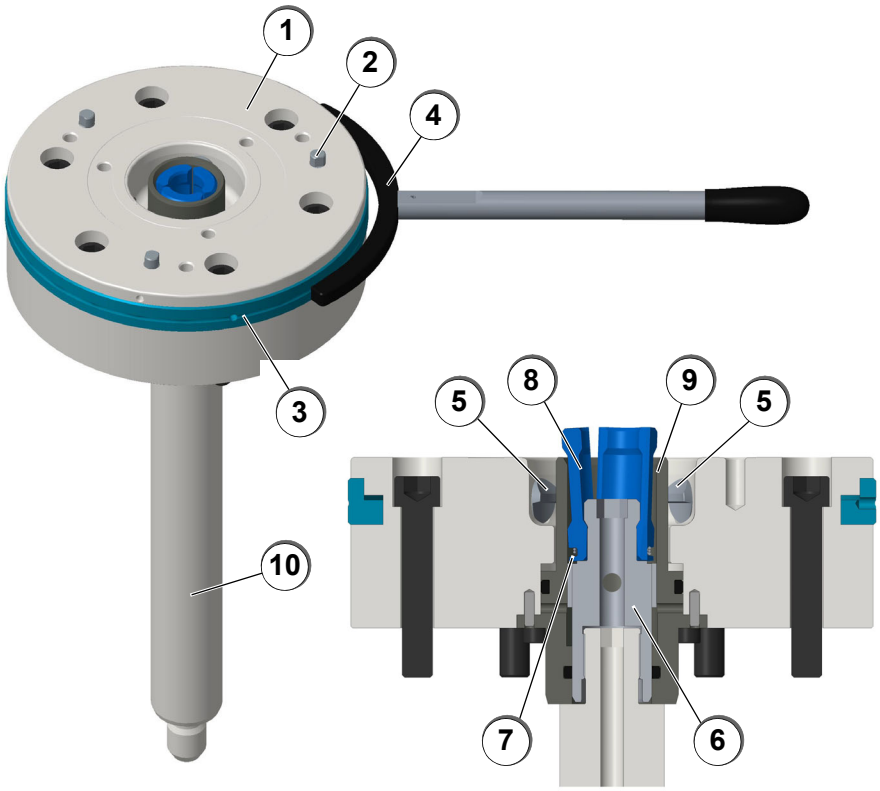
1 Basic body
2 Positioning pins
3 clamp ring
4 Actuation wrench
5 Clamping bolts for clamping the clamping device
6 Tractive bolt
7 Spacer
8 Gripper finger
9 Flange
10 Draw rod

Type QFP 185



1 Basic body
2 Positioning pins
3 clamp ring
4 Actuation wrench
5 Clamping bolts for clamping the clamping device
6 Tractive bolt
7 Spring ring
8 Gripper finger
9 Flange
10 Draw rod

Type QFP 275



1 Basic body
2 Positioning pins
3 clamp ring
4 Actuation wrench
5 Clamping bolts for clamping the clamping device
6 Tractive bolt
7 Spring ring
8 Gripper finger
9 Flange
10 Draw rod

Short description

The clamping device Quik-Flex® Plus in sizes QFP155, QFP185 and QFP275 serves as a quick-change interface. The QFP basic unit (1) is permanently installed on the work spindle of the gear cutting machine for this purpose. Via the quick-change interface, work-specific clamping devices (2) can be mounted and clamped down.

To change the clamping device (2) only the enclosed actuation wrench (4) is needed. With a turn (approx. 90°) of the actuation wrench (4) the clamping device (2) is engaged and locked on the Quik-Flex® Plus (1).

The actuation wrench (4) is set to a fixed torque value (80 Nm). It is thereby ensured that the clamping device is always locked with the same force.

When locking, three clamping bolts (5) are actuated via an internal cam closing mechanism in the clamp ring (3), ensuring that the clamping device (2) is fixated in a centered, force-locking and interlocking manner on the seat surface of the Quik-Flex® Plus unit (1).

4.2 Technical data

General data

	Type			
	QFP 155	**QFP 185**	**QFP 185 with inter-mediate plate**	**QFP 275**
Weight (kg)	11	18	65	46
Dimensions with draw rod (Ø x h in mm)	155 x 500	185 x 505	300 x 505	275 x 525
Pulling force F max. (daN)	4.000	10.000	10.000	10.000
Rotational speed max. (1/min)	1.500	1.000	1.000	850
Max. tightening torque (Nm)	60	60 for M10 80 for M12	60 for M10 80 for M12	120
Fixing screws	M10	M10 M12	M10 M12	M16

➢ The maximum pulling force must not be exceeded! Possibly the forces must be reduced due to the upper part.

Spindle speed

Safe speed, 2 rpm

Ambient conditions

Air temperature +15 to +45 °C
Air humidity 30 to 60 % (no condensation)

- No direct sunlight
- No heavy pollution from dust, acids, corrosive gases

➢ To cool components, only use emulsions that do not cause corrosion on the clamping device.

Performance data

NOTICE!

Damage to property!

▲ If the performance values of clamping device and the gear cutting machine do not match, severe property damage up to and including failure of the cutting machine could result.

➔ Only clamp the clamping device in machines with the same performance values.

➢ For specification of maximum clamping force and rotational speed, see the clamping device drawing or the clamping device itself.

Service life

max. 10 years

5 Installation and removal

5.1 Prerequisite

Personnel qualification

The clamping device may only be installed and dismantled by trained and instructed specialist personnel.

Personnel or interns who are to be trained, instructed or who are taking part in general training may only work at the clamping device under the constant supervision of an experienced person.

Personal protection equipment

All personnel is obliged to wear the following personal protective equipment:

- Safety shoes
- Hair net (for long hair)
- Protective gloves
- Tight-fitting work wear

5.2 Safety instructions

⚠ WARNING!

Risk of injury through improper handling or incorrect use!

▲ Improper handling or incorrect use of the clamping device can result in the following injuries:

- Crushing, impact and cutting injuries if the clamping device falls or shifts,
- Cutting injuries on sharp edges and corners on the clamping device.

➔ Wear safety boots and safety gloves during installation and dismantling of the clamping device. For heavy clamping devices (over 15 kg), also wear a protective helmet.

➔ For heavy clamping devices (over 15 kg), use lifting gear and fastening means with sufficient load capacity.

➔ Before working at the clamping device , the gear cutting machine is to be stopped, disconnected from the power supply and secured against being switched on again.

⚠ WARNING!

Risk of injury from automatically starting clamping device!

▲ An unexpected, automatically started clamping device could injure persons.

➔ Before starting assembly/disassembly, the gear cutting machine in which the clamping device is installed must be stopped.

5.3 Clamping device Quik-Flex® Plus type QFP 155

➢ Required tools and aids:

- Torque wrench,
- Crane and eye bolts for weights >15 kg.

5.3.1 Installation

➔ Prior to every installation, thoroughly clean all surfaces of the clamping device and those of the gear cutting machine.

➔ Insert draw rod (1).

➔ Place flange (2) with pins and O-rings on the draw rod (1).

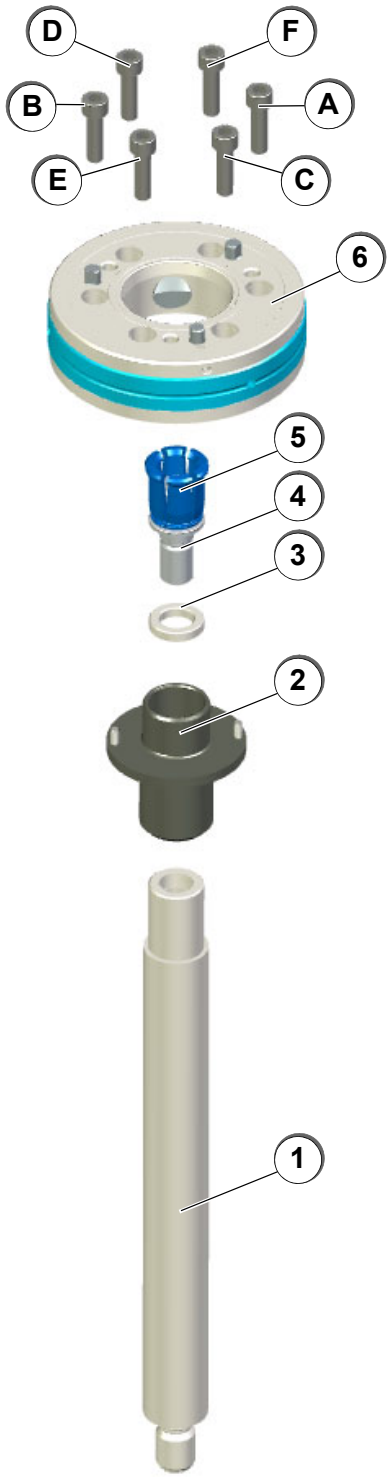
➔ Insert the spacer in (3) the flange (2).

➔ Insert tractive bolt (4) with gripper finger (5) in the flange (2).

➔ Place the QFP basic body (6) on the flange (2).

➔ Insert 6x M10x45 (A-F) fixing screws in the QFP basic body (6) and hand-tighten crosswise.

➢ **Use the same sequence during all other tightening operations of the screws!**



➔ Measure and adjust the radial runout of the clamping device using the dial gauge on the cone.

➢ Tolerance: max. 0.003 mm

➔ Tighten screws to 5 Nm.

➔ Measure the radial runout again and adjust if necessary.

➔ Tighten screws step by step:
1st round 20 Nm,
2nd round 40 Nm,
3rd round 60 Nm.

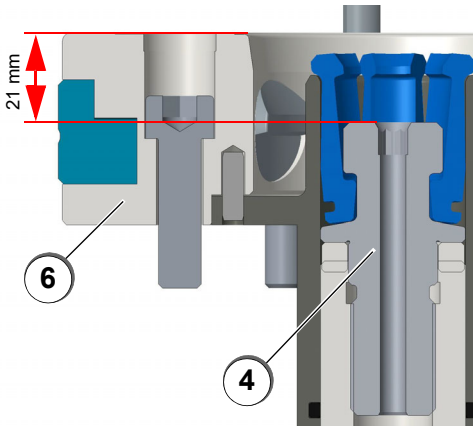
➔ After each round, check the radial runout at the bevel again.

➢ If radial runout gets worse, loosen the screws and readjust the radial runout!

Adjusting the stroke:

➢ In the released state, the distance from the upper edge of the QFP basic body (6) to the upper edge of the tractive bolt (4) must be 21 mm; use spacer to adjust if necessary.

➢ Observe the corresponding clamping device drawing here.



5.3.2 Removal

➢ Dismantling takes place in reverse order from installation.

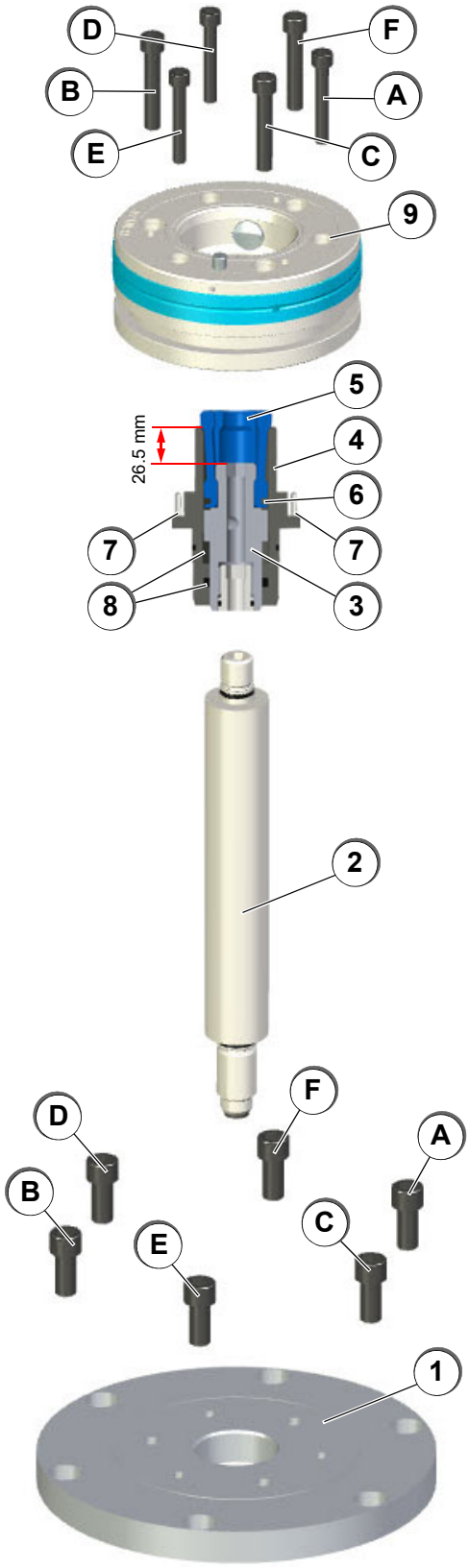
5.4 Clamping device Quik-Flex® Plus type QFP 185

➢ Required tools and aids:

- Torque wrench,
- Crane and eye bolts for weights >15 kg.

5.4.1 Installation

- ➔ Prior to every installation, thoroughly clean all surfaces of the clamping device and those of the gear cutting machine.
- ➔ Place the optional intermediate plate (1) in position.
- ➔ Insert 6x M16x35 (A-F) fixing screws in the intermediate plate (1) and tighten crosswise.
- ➔ Screw in draw rod (2) with O-rings.
- ➔ Screw in tractive bolt (3) with flange (4), gripper finger (5), spring ring (6), pins (7) and O-rings (8) on the draw rod (2) as far as it will go and then turn back approx. one quarter turn.
- ➢ The distance between the upper edge of the flange (4) and the tractive bolt (3) must be 26.5 mm. The clamping cylinder on the machine must be in the released position here (up).
- ➔ Place the QFP basic body (9) on the pins (7) on the flange (4).
- ➔ Slightly turn the QFP basic body (9) with tractive bolt (3) (incl. flange, etc.) so that the hole pattern for the fixing screws (A-F) is aligned.
- ➔ Insert fixing screws 3 x M10x65 (A, E, D) and 3 x M12x65 (C, B, F) in the QFP basic body (9) and hand-tighten crosswise.
- ➔ **Use the same sequence during all other tightening operations of the screws!**



➔ Measure and adjust the radial runout of the clamping device using the dial gauge on the cone.

➢ Tolerance: max. 0.003 mm

➔ Tighten screws to 5 Nm.

➔ Measure the radial runout again and adjust if necessary.

➔ Tighten screws step by step:
1st round 20 Nm,
2nd round 40 Nm,
3rd round M10 60 Nm and M12 80 Nm.

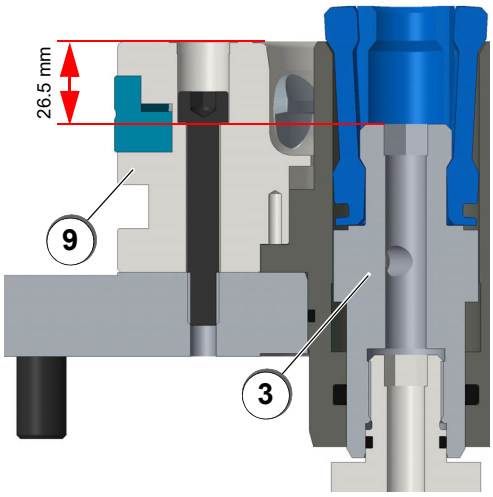
➔ After each round, check the radial runout at the bevel again.

➢ If radial runout gets worse, loosen the screws and readjust the radial runout!

Check stroke:

➢ In the released state, the distance from the upper edge of the QFP basic body (9) to the upper edge of the tractive bolt (3) must be 26.5 mm (tolerance -0.2/+0.1 mm). If necessary, loosen fixing screws (A-F) and turn QFP basic body (9) one division.

➢ Observe the corresponding clamping device drawing here.



5.4.2 Removal

➢ Dismantling takes place in reverse order from installation.

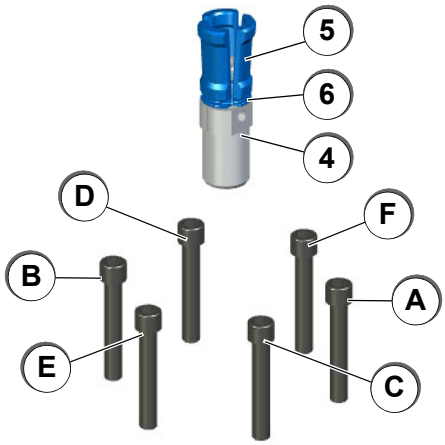
5.5 Clamping device Quik-Flex® Plus type QFP 275

➢ Required tools and aids:
- Torque wrench,
- Crane and eye bolts for weights >15 kg.

5.5.1 Installation

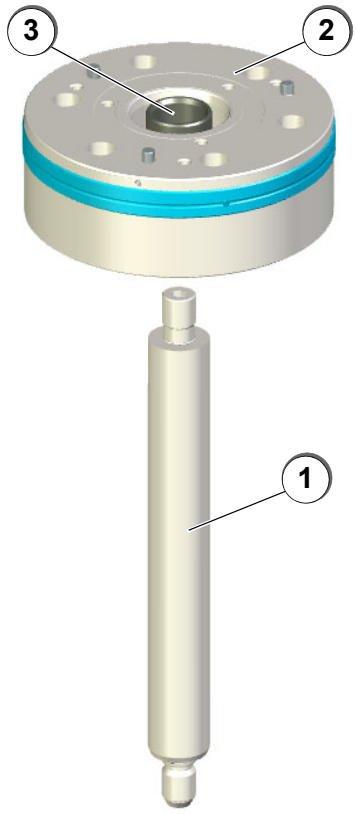
➔ Prior to every installation, thoroughly clean all surfaces of the clamping device and those of the gear cutting machine.

➔ Screw in draw rod (1) completely with spacers and O-rings.



➔ Insert QFP basic body (2) on the draw rod (1) including mounted flange (3).

➔ Insert 6x fixing screws M16x100 (A-F) in the QFP basic body (2) and hand-tighten crosswise.



➢ **Use the same sequence during all other tightening operations of the screws!**

➔ Insert tractive bolt (4) with gripper finger (5) and spring ring (6).

➔ Measure and adjust the radial runout of the clamping device using the dial gauge on the cone.

➢ Tolerance: max. 0.003 mm

➔ Tighten screws to 5 Nm.

➔ Measure the radial runout again and adjust if necessary.

➔ Tighten screws step by step:
1st round 20 Nm,
2nd round 50 Nm,
3rd round 80 Nm,
4th round 120 Nm.

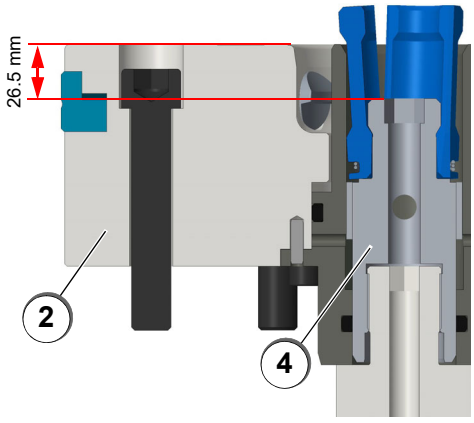
➔ After each round, check the radial runout at the bevel again.

➢ If radial runout gets worse, loosen the screws and readjust the radial runout!

Adjusting the stroke:

➢ In the released state, the distance from the upper edge of the QFP basic body (2) to the upper edge of the tractive bolt (4) must be approx. 26.5 mm; adjust screw depth using spacers.

➢ Observe the corresponding clamping device drawing here.



5.5.2 Removal

➢ Dismantling takes place in reverse order from installation.

6 Troubleshooting

6.1 Prerequisite

Personnel qualification

Faults on the clamping device may only be rectified by qualified and authorized specialist personnel with specialized training for mechanics and electrotechnology.

Personal protection equipment

All personnel is obliged to always wear the following personal protective equipment:

- Safety shoes
- Hair net (for long hair)
- Protective gloves
- Tight-fitting work wear

If necessary, e.g. when carrying out special work or as required by regulations, the following additional protective equipment must be used:

- Eye protection (during troubleshooting, maintenance and servicing, as well as when handling with hazardous substances)

6.2 Safety instructions

⚠ WARNING!

Risk of injury due to improperly performed work!

▲ During troubleshooting and fault rectification on the clamping device, injuries could result from improperly performed work.

➔ **Observe safety notices in Chapter 2 – Safety!**

➔ Observe the applicable regulations on occupational safety and accident prevention!

➔ Check all work!

➔ Depending on the activities to be performed, use appropriate personal protective equipment!

➢ Failure to comply with the safety instructions and regulations may result in accidents at work and property damage.

6.3 Procedure

- ➔ Immediately stop the gear cutting machine in which the clamping device is installed. If necessary, disconnect from external power supply, depressurize and secure against unexpected restart.
- ➔ Determine the cause.
- ➔ Rectify the fault (of have rectified).
- ➔ If applicable, reconnect the compressed air properly and turn on the power supply to the gear cutting machine.
- ➔ Check function.

Contact If you have questions about faults, contact the manufacturer (see back of operating manual).

7 Maintenance and care

7.1 Prerequisites

Personnel qualification

Maintenance, cleaning and servicing of the clamping device may only be rectified by qualified and authorized specialist personnel with specialized training for mechanics and electrotechnology.

A safe and error-free practice of these activities and interventions is only guaranteed if special expertise exists for these activities.

Personal protection equipment

All personnel is obliged to always wear the following personal protective equipment:

- Safety shoes
- Hair net (for long hair)
- Protective gloves
- Tight-fitting work wear

If necessary, e.g. when carrying out special work or as required by regulations, the following additional protective equipment must be used:

- Eye protection (during troubleshooting, maintenance and servicing, as well as when handling with hazardous substances)

7.2 Safety instructions

⚠ WARNING!

Risk of injury due to improperly performed work!

- ▲ Persons may be injured during the troubleshooting and fault rectification of the clamping device by improperly performed work.
- ➔ **Observe safety notices in Chapter 2 – Safety!**
- ➔ Observe the applicable regulations on occupational safety and accident prevention!
- ➔ Check all work!
- ➔ Depending on the activities to be performed, use appropriate personal protective equipment!
- ➢ Failure to comply with the safety instructions and regulations may result in accidents at work and property damage.

⚠ WARNING!

Risk of injury from automatically starting clamping device!

- ▲ An unexpected, automatically started clamping device could injure persons.
- ➔ Before beginning maintenance, cleaning, and servicing work, the gear cutting machine in which the clamping device is installed must be switched off, disconnected from the power supply, depressurized and secured against being accidentally switched on again.

7.3 General instructions

Maintenance intervals

All maintenance and repair work must be carried out regularly and carefully at the prescribed intervals.

The specified intervals are guide values and relate to single-shift operation under normal operating conditions. For multi-shift operation or for less favorable operating conditions, the intervals are shortened according to the operating time and must be adapted to the respective requirements!

Necessary repair work must be carried out in good time, i.e. immediately after the damage has been detected, by qualified personnel.

Contact

If you have questions about maintenance and repair, contact the manufacturer (see back of operating manual).

7.4 Cleaning agents and lubricants

Cleaning agent

Use a mild (non-aggressive) detergent and a soft, lint-free cleaning cloth to clean the surfaces.

Do not use solvent-based cleaning agents which by themselves, or in combination with other substances, liquids, atmospheres (gases), can lead to fire or explosion hazards, or which change the materials used, or dissolve/attack the surfaces.

Cleaning the clamping device with compressed air or water (high-pressure cleaner) is forbidden!

Observe instructions and markings on the containers / packaging of the cleaning agents.

Recommended lubricants

Only use greases as a lubricant that meet the requirements regarding adhesion, pressure resistance and solubility in cooling lubricants.

Lubricant	Manufacturer	Product name
Grease	Klüber Lubrication	ISOFLEX NBU 15/ ALTEMP Q NB 50
Assembly paste (for dry processing)	Sonax	Professional ceramic paste spray

7.5 Maintenance and cleaning plan

Interval	Task
daily	▪ Perform a visual inspection for soiling, wear and damage of the clamping device. ▪ Clean when heavily soiled.
monthly	▪ Thoroughly clean the clamping device. ▪ Perform a visual inspection for wear and damage of the clamping device. ▪ Lightly grease the inner cone of the QFP basic body with special grease. ▪ Check the magnetic charge of the clamping device and all workpiece contacting parts (max. 5 gauss); demagnetize if necessary. ▪ Perform a functional check. ▪ Treat clamping device with corrosion protection.
Quarterly	▪ Measure the radial runout of the clamping device with a dial gauge on the cone and readjust if necessary. ▪ Measure the axial run-out of the clamping device with a dial gauge and readjust if necessary.

8 Spare parts / wear parts

Note Spare and wear parts must meet the technical requirements specified by the manufacturer. This is only guaranteed with original spare parts.

Incorrect or faulty replacement parts can impair safety and lead to damage, malfunction or total failure.

Spare and wear parts are not included in the warranty.

8.1 List for spare / wear parts

Type	Gripper finger Order No.	Tractive bolt Order No.
QFP 155	1346066	1346067
QFP 185	40856280	1475393
QFP 185 with Intermediate plate	40856280	1475393
QFP 275	40856280	1482262

Contact For the purchase of spare and wear parts, or if you have any service questions, contact the manufacturer (see back of operating manual).

9 Storage and disposal

9.1 Storage and conservation

To keep the unused clamping device functional even over longer periods of time:

- Thoroughly clean the clamping device
- Treat the clamping device with corrosion protection.
- Pack the clamping device in oiled paper and then in bubble wrap so that no dirt or dust can penetrate.
- Securely store the clamping device.
- Storage room must be dry and clean.
- Storage temperature 15 - 35°C, humidity max. 60%.
- Protect the clamping device against sunlight.
- Avoid mechanical shocks.

If storing for longer than 3 months, check the condition of the clamping device and of the packaging every three months and refreshen or replace the preservation if necessary.

The manufacturer assumes no liability or warranty for corrosion damage caused by improper storage, such as storage in damp room or similar.

Re-commissioning

Before recommissioning after a longer storage period, completely clean the clamping device, demagnetize and check for defects and rectify (or have rectified) if necessary.

9.2 Disposal

Personnel qualification

The clamping device may only be disposed of by specialist personnel in compliance with the local safety regulations. It is recommended to to seek the support of certified waste disposal companies.

Segregate different materials

Separate components of the clamping device according to type and dispose of properly. Check materials before disposal to establish whether reuse is possible.

- ➔ Scrap metals.
- ➔ Recycle packaging materials and plastic items.
- ➔ Dispose of other components sorted according to material characteristic.

Dispose of problematic and waste materials that are no longer usable, such as operating and auxiliary materials, properly at the designated disposal points.

Protect the environment

Comply with general and local environmental protection regulations. Observe environmental regulations (water, waste and immission control acts, and the Existing Substances Regulation for chemicals).

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