BÖRGER®
Innovation

Supplementary Operating Manual

Multichopper P...INL

ATEX Version

Börger Worldwide

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* Algeria, Morocco: See France, Börger France S.A.R.L.

Product Specifications

Machine:	
Product group:	Multichopper
Type:	Börger Multichopper P...INL ATEX$_{(ext)}$ version The precise product specifications for your Multichopper can be found in the data sheet enclosed with this operating manual.
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Contents

1 Introduction

This supplementary operating manual is an addition to the standard operating manual for the Multichopper. It relates to an additional component or optional special equipment.

Before working on your Multichopper, you must have completely read and understood the standard operating manual, particularly the safety instructions.

In addition to the instructions in the standard operating manual, the following instructions and restrictions must be observed.

1.1 Information for the operator

All the relevant regulations must be complied with, when a Multichopper is operated in potentially explosive atmospheres. Within the scope of application, the operator is obliged to ensure the notice and observance specifically of

- the 94/9/EC directive on equipment and protective systems intended for use in potentially explosive atmospheres (the so-called ATEX* Directive)
- the Machinery Directive 2006/42/EC
- the national and international occupational safety regulations
- the explosion protection regulations
- the hazardous substances regulations
- the accident prevention regulations
- the other relevant national and international directives and regulations.

* The acronym ATEX comes from the French **AT**mosphère **EX**plosive

2 Safety

The installation and maintenance work may only be carried out by **qualified technicians** that have been trained and instructed to perform this work, in accordance with the local regulations.

2.1 Proper use

(In addition to chapter 2.3 of the standard operating manual)

ATEX versions of the Börger Multichopper are constructed to be suitable for use in potentially explosive atmospheres according to the 94/9/EC directive in accordance with their markings.

The equipment group and category of your Multichopper are defined in the **marking on the nameplate**, the supplied data sheet and the separately enclosed declaration of conformity.

The marking, and consequently the permissible area of application, depends on the nature of the equipment.

The possible markings, in various combinations, are:

Marking	Meaning	
II	Equipment group II	Suitable for use above ground, not approved for mining / underground
2	Category 2 for use in zone 1 / 21	(Zone 1 / 21= contingent risk of ignition, 10 to 1000 h per year)
3	Category 3 for use in zone 2 / 22	(Zone 2 / 22 = remote risk of ignition, 0.1 to 10 h per year)
G	G = Gases	Suitable for flammable gases (G)
D	D = Dust	Suitable for flammable dust (D)
IIA	For flammable gases	Ammonia, for example
IIB	For easily flammable gases	Coke oven gas, for example
IIC	For highly flammable gases	Hydrogen, for example
c	Ignition protection through design safety	Such as increased access safety on the quick-release cover (hexagon nuts)
b	Ignition protection through ignition source monitoring	Flow monitoring on the plant-side is essential or alternatively temperature and fill level monitoring in the pipe line, near the Multichopper; ignition source monitoring on the device is not possible
T3	Max. surface temperature of the equipment 200 °C **(392° F)**	
T4	Max. surface temperature of the equipment 135 °C **(275° F)**	
T6	Max. surface temperature of the equipment 85 °C **(185° F)**	
IP 5X	Casing protection class (if suitable for flammable dust)	
X	Additional requirements according to operating manual	
(ext)	Approval restriction: the potentially explosive atmosphere may only occur outside the Multichopper (externally)	

In respect of the drive as well as all the electric and other additional devices, the **type examination certificates** or declarations of conformity in accordance with the provisions of the 94/9/EC directive must be available.

The classification must at least correspond to that of the Multichopper or to a higher level of safety. The parts must be marked accordingly.

The use of the entire unit is subject to the lowest approval rating of the individual components used.

Changes to the machine may invalidate its approval rating and marking.

Moreover, the approval for the use in potentially explosive atmospheres terminates if non-original spare parts are used.

The proper use of the Multichopper in potentially explosive atmospheres is subject to it being used solely in the version in which it was delivered, in accordance with the relevant marking, **within the scope of the operating conditions specified in the order** and taking all the restrictions listed in the standard operating manual and data sheet into account.

In particular, the operator has the responsibility of

— guaranteeing the **flow during operation** and ensuring that a dry run is avoided by means of suitable measures

— ensuring that the specified **medium and ambient temperatures** are not exceeded.

2.1.1 Operator's ignition hazard assessment

The proper use assumes that the operator has correctly carried out an ignition hazard assessment according to the applicable regulations and the version of the Multichopper delivered has been determined to be suitable for the particular use.

2.1.2 Operating limits

The **operating limits** specified in the marking and the data sheet must be complied with strictly.

All the **limits** of the Multichopper (see chapter 3.3.2 of the standard operating manual) as well as any attachments must be adhered to, the values may neither fall below nor exceed these. This applies even in the case of a malfunction.

In particular, the temperature of the flow medium may not exceed 80 °C **(176 °F)**. The ambient temperature may not exceed 40 °C **(104 °F)**. Frost must be completely avoided.

2.1.3 Ignition source monitoring

ATEX versions of the Börger Multichopper are in general marked

— **c** (ignition protection through design safety) and

— **b** (ignition protection through ignition source monitoring that is not on the device but **in the plant** into which the device is installed)

A suitable **flow monitor** is necessary in the plant into which the Multichopper is installed; in this regard see chapter 8.

The switch point of a **flow monitoring device** must be selected in such a way that the Multichopper does not run dry, i.e. operates without flow medium, for longer than 90 seconds at maximum.

Alternatively, the ignition source can be monitored through a suitable **temperature monitoring device and concurrently monitoring the fill level** with a suitable monitoring device. These devices may not be installed further than 5 m **(16 ft)** from the Multichopper.

The switch point of a **temperature monitoring device** must ensure that the temperature of the medium in the Multichopper does not exceed 80 °C **(176 °F)**. The switch point of the **fill level sensor** that is to be used concurrently must be selected in such a way to ensure that the Multichopper never runs dry for longer than 90 seconds.

Note

If a shutdown is caused by a monitoring device, the cause must be established and any faults eliminated before restarting.

The integrity of the blades and the shaft seal must be checked and they should be replaced in case of doubt to avoid any danger.

Note

Monitoring the flow or alternatively the concurrent monitoring of the temperature and fill level may only be dispensed with, if an interruption of the flow (rise in temperature) has been generally excluded on the plant-side according to the ignition hazard assessment by the operator and the likelihood of a fault occurring is seldom or unlikely.

The flow monitoring device must at least have an IPL 2 (ignition protection level) as per DIN EN 13463-6 to monitor faults (flow interruptions) that can arise during normal operating conditions and an IPL 1 for monitoring faults (flow interruptions) that, although foreseeable, do not occur regularly.

The same applies if, in the alternative, a temperature monitoring device and a fill level monitoring device are used concurrently.

2.2 Residual risk

(In addition to chapter 2.4 of the standard operating manual)

The risk of ignition posed by the Multichopper, as a non-electric component, arises primarily from potentially overheating, for example due to a dry run, friction and hot surfaces.

This risk can largely be eliminated by observing all the operating instructions and limits of the Multichopper.

Nevertheless, the residual risks involved in operating the Multichopper in potentially explosive atmospheres remain:

Danger!

Risk of ignition due to overheating, e.g. by running dry!

Make sure that a dry run is avoided even when starting up, for example by pre-filling.

Always ensure, particularly after maintenance work, that all the ignition source monitoring devices used (see chapter 2.1.3) have been properly inserted, connected and are operational so that the Multichopper will be switched off if there is a dry run (and the temperature accordingly increases).

If available, make sure that the ball valve is closed and secured against accidental opening during operation, e.g. by removing the lever.

Danger!

Risk of ignition due to insulating layers!

Make sure that the layers of paint do not exceed the maximum permissible layer thickness.

Danger!

Risk of ignition due to combustible dust!

Combustible dust can

— produce a potentially explosive atmosphere (dust cloud)
— self-ignite by spontaneous heating
— self-ignite on hot surfaces
— result in the Multichopper overheating.

There is a risk of dust explosion due to external ignition for numerous types of dust with layers < 1 mm **(.04")**.

From a layer of dust > 5 mm **(.20")**, the Multichopper may be subject to an impermissible and dangerous rise in temperature which could lead to a direct ignition of dusts.

Make sure that dangerous dust deposits are not formed.

Danger!

Risk of ignition due to the reaction of the flow medium with the external potentially explosive atmosphere!

If the mechanical seal leaks, flow medium can enter the intermediate chamber. If the inspection intervals are not observed, the intermediate chamber may overflow.
If the flow medium may not come into contact with the atmosphere, appropriate measures must be taken to prevent the flow medium from escaping into the atmosphere without the functionality of the intermediate chamber being compromised.

Observe the maintenance intervals set out in chapter 6.1.1.

Danger!

Risk of ignition due to impermissible frictional heat when operated with a worn hexagonal profile of the carrier shaft!

You must ensure that the Multichopper is not operated with a worn hexagonal profile.

Observe the maintenance intervals set out in chapter 6.1.1.

Warning!

Risk of ignition by producing high-energy sparks!

If rust forms on the machine, high-energy sparks can be generated by the metallic parts coming into contact with rusty parts.

Always properly repair any damage to a surface coating immediately to prevent rust forming.

Warning!

Risk of ignition due to an impermissible increase in temperature of the mechanical seal!

The heat-absorbing quench fluid prevents the mechanical seal from running dry and captures any flow medium that enters the intermediate chamber due to leaks in the mechanical seal. This ***quench*** function also prevents the gear unit of the drive from being damaged by intrusion of the flow medium.

Under unfavorable conditions (e.g. concurrent impermissible absence of the cooling flow medium), the intermediate chamber running dry can cause an impermissible increase in temperature of the mechanical seal.

Check the fill level of the intermediate chamber at the level indicator on a regular basis. Do not exceed the maintenance intervals.

2.3 Marking and signs on the Multichopper

(In addition to chapter 2.6 of the standard operating manual)

ATEX versions of the Multichopper are **additionally** marked as follows:

Meaning:
Nameplate with marking according to directive 94/9/EC [2)]

Location:
In a clearly visible position on the Multichopper

[1)] Different address possible, e.g. when delivered through a subsidiary.

[2)] The actual marking of your Multichopper will be in accordance with the agreed operating conditions, see chapter 2.1.

2.4 Safety instructions for maintenance and rectifying malfunctions on the Multichopper

(In addition to chapter 2.9 of the standard operating manual)

Have the maintenance and repair work on the ATEX Multichopper only carried out by qualified technicians that have been trained and are authorized to perform this work.

Prior to the commencement of any maintenance, installation or repair work that is to be performed on the Multichopper, ensure that a potentially explosive atmosphere cannot arise while this work is being performed, until the unit is fully back in operation.

Only use tools with which there is no risk of generating sparks.

A residue of the flow medium remains in the Multichopper after the plant has been switched off. Take all relevant precautions and safety measures to prevent hazards from arising when opening the quick-release covers.

Before the unit is commissioned after any repair work, have the Multichopper accepted in accordance with the applicable guidelines by a person who is qualified and authorized to do so, and record this in an acceptance report.

3 Product Description

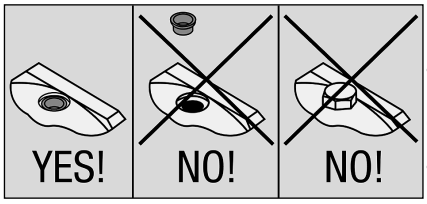
(In addition to chapter 3 of the standard operating manual)

The external components of the ATEX version of the Multichopper are made of metal and are firmly connected to each other. They form an electrically conductive path with a resistance of less than 1000 Ω.

In the ATEX version of the Multichopper, the quick-release cover is fastened with hexagon nuts according to DIN EN ISO 4032 in view of the increased safety requirements.

PTFE based gaskets (e.g. TOPChem®) are used on the pipe connectors for P...INL ***plus*** versions.

When used in areas in which there may be flammable dust, the intermediate chamber is sealed dustproof with an IP 54 PE safety plug. There is no breather on the side on this version.



The plug must be able to move out without pressure when the quench is overfilled.

The opening may only be closed with the optional safety plug.

4 Transportation, Storage and Installation

4.1 Storage / interim storage

(In addition to chapter 4.2 of the standard operating manual)

Warning!

Risk of ignition due to static electric charges when improperly painted!

Ensure that, when any damage to the paintwork is repaired, a maximum layer thickness of

200 µm for IIC approval and
2000 µm for IIB approval

is not exceeded. Failing which, a potential risk of ignition is created by the insulating layers.

A standard single layer of paint on the Multichopper has a thickness of **80 µm**.

4.2 Installation

(In addition to chapter 4.3 of the standard operating manual)

- Before commencing with the installation, ensure that the Multichopper is suitable for the intended use according to the **marking** on the nameplate and in the data sheet. The operator is obliged to carry out an appropriate ignition hazard assessment when the intended use is in potentially explosive atmospheres. Compare the results of this assessment with the properties of the Multichopper and only use the Multichopper if you are certain that it is suitable.

4.2.1 Positioning

- Ensure that the ambient temperature at the Multichopper does not exceed the limit of 40 °C **(104 °F)**. Also ensure that hot air, for example, from other parts of the plant does not increase the ambient temperature at the Multichopper in excess of this limit.

- Make sure that the Multichopper is properly protected from frost at the installation site.
- Ensure that the flow on the plant-side is monitored so that a dry run of the Multichopper and the resulting impermissible temperature rise are avoided with certainty or that a temperature monitor with a concurrent fill level monitor prevent a dry run and an impermissible temperature rise.

For monitoring the flow:

There must not be any closing devices in the pipe lines between the flow monitoring device and the Multichopper. The unimpeded flow must be guaranteed by the plant.

Set the switch point of the flow monitoring device so that the Multichopper cannot, under any circumstances, run for longer than 90 seconds without the flow medium flowing freely.

For monitoring the temperature and fill level:

These temperature and fill level monitoring devices may not be installed further than 5 m **(16 ft)** from the Multichopper.

The switch point of a temperature monitoring device must ensure that the temperature of the medium in the Multichopper does not exceed 80 °C **(176 °F)** ($T_{sp\ max}$ 85 °C **(185 °F)**).

The switch point of the fill level monitoring device that is to be used concurrently must be selected in such a way to ensure that the Multichopper never runs dry for longer than 90 seconds.

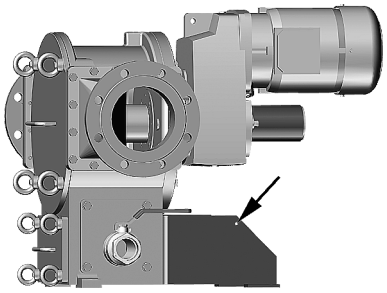
Note

Monitoring the flow or alternatively the concurrent monitoring of the temperature and fill level may only be dispensed with, if an interruption of the flow (rise in temperature) has been generally excluded on the plant-side according to the ignition hazard assessment by the operator and the likelihood of a fault occurring is seldom or unlikely.

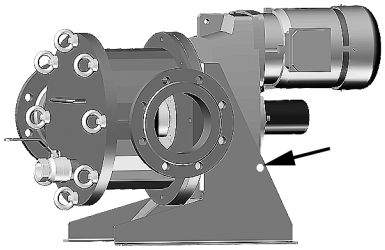
4.2.2 Pre-filling / start-up volume

- Take appropriate measures to ensure that a sufficient start-up volume is available to the Multichopper when it is commissioned as well as whenever it is recommissioned after any repair work.

4.2.3 Grounding



The ground terminal of the Multichopper is on the fixing bracket, see figures.



- Ground the Multichopper.
- Ground the unit according to the operating manual of the drive manufacturer.
- Ensure that all the parts of the unit are conductively connected (have this checked by a qualified electrician using an appropriate measuring device).

4.2.4 Acceptance / acceptance report

- Before commissioning the unit, have the Multichopper, its installation as well as the connections accepted in accordance with the applicable guidelines by a person who is qualified and authorized to do so, and record this in an acceptance report.

5 Operation

5.1 Commissioning

(In addition to chapter 5.2 of the standard operating manual)

Note

There might be residues of soft soap in the Multichopper as a result of the manufacturing process and test runs. Dirt caused by packaging and transport cannot be ruled out.

If necessary, thoroughly rinse the Multichopper with a suitable agent while adhering to the limits before commissioning the Multichopper for the first time.

- Before switching the unit on
  - when it is commissioned
  - when it is recommissioned after any repair work

  ensure that the Multichopper is pre-filled and does start up running dry.
- Before commissioning the unit and before recommissioning it after any repair work, check that the necessary flow monitoring device on the plant-side functions properly.
- Ensure that the limits are correctly set or the limit is correctly set, when performing this check.
- Before the unit is recommissioned after any repair work, have the Multichopper accepted in accordance with the applicable guidelines by a person who is qualified and authorized to do so, and record this in an acceptance report.

6 Maintenance and Repairs

6.1 Machine care

(In addition to chapter 6.1 of the standard operating manual)

Warning!

Risk of ignition due to combustible dust!

Combustible dust can

— produce a potentially explosive atmosphere (dust cloud)

— self-ignite by spontaneous heating

— self-ignite on hot surfaces

— result in the Multichopper overheating.

There is a risk of dust explosion due to external ignition for numerous types of dust with layers < 1 mm **(.04")**.

From a layer of dust > 5 mm **(.20")**, the Multichopper may be subject to an impermissible and dangerous rise in temperature which could lead to a direct ignition of dusts.

Make sure that dangerous dust deposits are not formed.

- Regularly remove this dust taking the necessary safety measures into account. Prevent static electric charges being generated when doing so by using appropriate cloths, moistened if necessary.

Warning!

Risk of ignition due to static electric charges when improperly painted!

Ensure that, when any damage to the paintwork is repaired, a maximum layer thickness of

200 µm for IIC approval and
2000 µm for IIB approval

is not exceeded. Failing which, a potential risk of ignition is created by the insulating layers.

A standard single layer of paint on the Multichopper has a thickness of **80 µm**.

Warning!

Risk of ignition by producing high-energy sparks!

If rust forms on the machine, high-energy sparks can be generated by the metallic parts coming into contact with rusty parts.

- Always properly repair any damage to a surface coating immediately to prevent rust forming.

6.1.1 Maintenance and inspection plan

(In addition to chapter 6.2.1 of the standard operating manual)

In view of the increased safety standards for the use of Multichoppers in potentially explosive atmospheres, the following maintenance intervals are recommended for the prevention of the ignition hazards.
The intervals are **guidelines**. **These intervals can be significantly reduced depending on the operating conditions.**

- Compile a maintenance plan in accordance with the operating conditions, if necessary.
- In addition, observe the maintenance intervals in the operating manual for the drive.

Inspection / maintenance	Interval (approx.)	Operating hours (approx.)	Measures
Checking the exterior surfaces for dust deposits and dirt	D	24	Clean the outer surfaces
Visual check for leaks*	D	24	Replace the seals, if necessary
Audible check for smooth running	D	24	Check the blades and replace, if necessary
Checking the level indicator of the quench fluid in the intermediate chamber	D	24	Refill, if necessary
Checking the functions	W	168	Replace wear parts, if necessary
Making sure that there is no play between the hexagonal profile of the carrier shaft and the blade holder	W	168	Replace the carrier shaft, if necessary
If the quench fluid is incompatible with the drive gear oil: Analyzing the condition of the oil in the drive gear unit for impurities	M	600	Contact Börger customer service or send the Multichopper for repair
Checking the Multichopper and attachment parts for tight fit and possible damage	¼ Y	2,160	Tighten any loosened parts Replace any damaged parts
Changing the lubricant (drive gear unit, intermediate chamber)	1 Y	8,000	Gear unit: see the manufacturer's operating manual; Intermediate chamber: see the standard operating manual, data sheet, lubricant list
Grounding of all unit parts	1 Y	8,000	Ensure grounding, if necessary
General overhaul (includes checking the shafts)	5 Y	40,000	Contact Börger customer service or send the Multichopper for a general overhaul.

* Includes check of fill level / any overflowing quench fluid

N = when necessary **M** = monthly
D = daily **Y** = yearly
W = weekly

6.1.2 Lubricant fill level and changing the lubricants

(In addition to chapter 6.2.2 of the standard operating manual)

When using the Multichopper in potentially explosive atmospheres, the fill levels and the quality of the lubricants must be checked particularly carefully and regularly.

Warning!

Risk of ignition due to an impermissible increase in temperature of the mechanical seal!

The heat-absorbing quench fluid prevents the mechanical seal from running dry and captures any flow medium that enters the intermediate chamber due to leaks in the mechanical seal. This ***quench*** function also prevents the gear unit of the drive from being damaged by intrusion of the flow medium.

Under unfavorable conditions (e.g. concurrent impermissible absence of the cooling flow medium), the intermediate chamber running dry can cause an impermissible increase in temperature of the mechanical seal.

Check the fill level of the intermediate chamber at the level indicator on a regular basis. Do not exceed the maintenance intervals.

- Carefully observe the enclosed
  - Lubricant list
  - Operating manual of the drive gear unit manufacturer
- Check the oil / lubricant levels on a regular basis.
- Ensure that the levels do not fall below the minimum.
- Replace the mechanical seal when the intermediate chamber overflows and when the intermediate chamber running dry during vacuum operation indicates a mechanical seal leakage.
- Only use the same lubricant in the intermediate chamber that was agreed to when the order was placed and is specified in the data sheet. Different lubricants may only be used after obtaining written confirmation from Börger GmbH.

Note

The **ignition temperature** of the lubricants must be **>** 200 °C **(392 °F)** or **at least 50 °C (122°F) higher than the maximum temperature of the medium**, or the lubricants must not be combustible.

The evaporation point must be at least 40 °C **(104 °F)** above the temperature of the medium if, depending on the application, a special quench fluid is used for which a risk of evaporation cannot be excluded (non-combustible fluid).

Only use high-grade lubricants, see the lubricant list in the appendix of the standard operating manual.

Adhere to the maintenance interval for analyzing the gear oil if, depending on the application, a special quench fluid is used which is not compatible with the gear oil of the drive gear unit.

6.1.3 Notes on repair work

(In addition to chapter 6.3.1 of the standard operating manual)

Danger!

Risk of sparks due to falling parts and working with tools on metal!

Ensure that a potentially explosive atmosphere cannot arise while any maintenance and repair work is being performed.

Danger!

Using inappropriate spare parts can result in the Multichopper no longer being suitable for use in potentially explosive atmospheres!

Suitability in accordance with the marking on the nameplate, in the data sheet and the declaration of conformity is only retained, if appropriate original spare parts, made of the same materials and of the same quality and type, as when originally supplied, have been used.

Furthermore, spare parts for Multichoppers of the same basic type, but without ATEX approval, cannot be safely used in all cases for a Multichopper with ATEX approval.

The failure to observe this requirement results in explosion protection no longer being guaranteed.

If in doubt, ask your Börger customer service which spare parts you require.

6.2 Repairs

6.2.1 Opening and closing the quick-release cover

(In addition to chapter 6.3.2 of the standard operating manual)

- Gradually tighten the cover nuts (1) uniformly crosswise to ensure a leak-free tightness of the Multichopper and that the nuts cannot be loosened by hand; tightening no more than the maximum torque specified below:

Multi-chopper	Hexagon nut DIN EN ISO 4032 / stud screw DIN 939	Torque	
		Steel 8.8	Stainless steel Property class 70
P150	M10	46 Nm (34 ft-lbs)	33 Nm (24 ft-lbs)
	M 8	23 Nm (17 ft-lbs)	16 Nm (12 ft-lbs)
P300	M16	180 Nm (133 ft-lbs)	180 Nm (133 ft-lbs)
	M12	80 Nm (59 ft-lbs)	60 Nm (44 ft-lbs)

6.2.2 Checking the hexagonal shaft for wear

(In addition to chapter 6.3.5 of the standard operating manual)

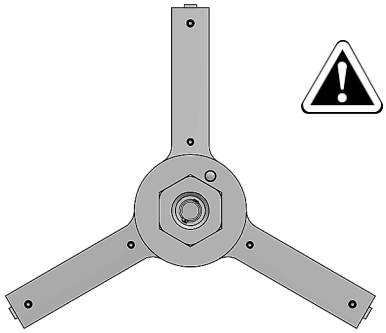


Fig. 6.1.5a Normal condition

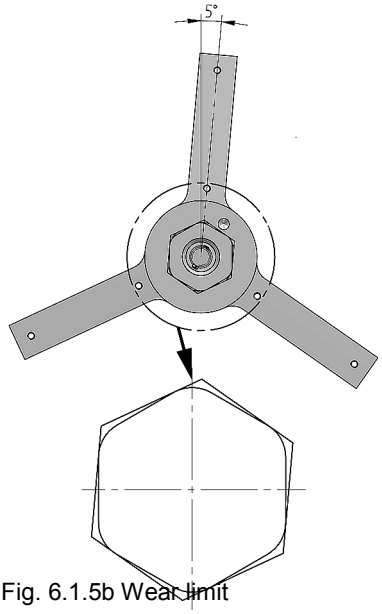


Fig. 6.1.5b Wear limit

Danger!

Risk of ignition due to impermissible frictional heat when operated with a worn hexagonal profile of the carrier shaft!

Ensure that there is no play between the blade holder and the hexagonal profile. If the hexagonal profile is worn, the blade holder and the MCA unit connected to it no longer turn while the shaft continues rotating. This would generate frictional heat that would pose a serious risk of ignition in an explosive atmosphere.

You must ensure that the Multichopper is not operated with a worn hexagonal profile.

- Ensure that there is never any play between the blade holder and the hexagonal profile by performing, at minimum, the weekly check according to chapter 6.1.1.

  If the blade holder can be moved by more than 5° on the hexagonal profile of the stationary carrier shaft, the carrier shaft must be replaced according to chapter 6.3.5 of the standard operating manual.

7 Disposal

(In addition to chapter 7 of the standard operating manual)

- In addition to the measures set out in the standard operating manual, make certain that the parts being disposed of are free of potentially explosive substances.

8 Accessories

(In addition to chapter 8 of the standard operating manual)

- Observe the minimum requirements for ignition source monitoring according to chapters 2.1.3 and 4.2.1 of this supplementary operating manual.
- Only use electric and other additional devices that have type examination certificates or declarations of conformity in accordance with the provisions of directive 94/9/EC, and specifically with a classification that at least corresponds to that of the Multichopper or has a higher level of safety.
- Make sure that the accessories have the appropriate markings.
- Observe the instructions contained in the manufacturer's operating manual and comply with the limits of the accessory.

9 Appendix

9.1 Declaration of conformity

(In addition to chapter 9.8 of the standard operating manual)

The declaration of conformity for your Multichopper, setting out the appropriate marking, is separately enclosed with this supplementary operating manual.