OPERATING MANUAL

BURGMANN LICENCE MECHANICAL SEAL

LP-D-SA-D31H5/120-DE1 , Q12Q12EGG-AQ12EGG

▪ DESCRIPTION

▪ Single-acting mechanical seal plus quench ▪ Balanced ▪ Bi-rotational ▪

Mechanical seal for Voith Sulzer/Andritz refiner/fiberizer as complete, ready-to-install, work-tested cartridge unit. The mechanical seal is single-acting, balanced, independent of the direction of rotation.

▪ **PLEASE READ** this manual carefully and **OBSERVE** the information contained as to:

▪ Safety ▪ Storage ▪ Installation ▪ Start up ▪ Maintenance ▪ Repair

If there are any unclear points please **contact BURGMANN by all means.**

▪ OPERATING LIMITS

Shaft diameter dw	= 210mm
p1	= 16 bar
t	= +140°C
vg	= 10 m/s *

Operation under **several limit values simultaneously should be avoided** as higher loads (pressure, temperature, speed) can increase wear or lead to **damage of sliding faces or elastomers.** This could result in a **shorter service life** and in the risk of a sudden **seal failure endangering men** and environment.

▪ SUPPLY

For a safe operation of the mechanical seal we recommend to apply the most suitable kind of circulation described in API 610.

▪ EMISSIONS

A **mechanical seal** is a dynamic seal that **cannot be free of leakage** due to physical and technical reasons. Seal design, manufacture tolerances, operating conditions, running quality of the machine, etc. mainly define the leakage value. In fact, compared to other sealing systems (e.g.packings) there is **few leakage. Medium may splash out if the seal fails.** Personal injury may be **prevented by the user** providing for splash protection and wearing safety goggles. Care has to be taken by the user for **proper disposal** of the leakage.

The leakage may occur in liquid or gaseous form. It's aggressiveness is equivalent to that of the medium to be sealed. Leakage of mechanical seal at outboard side has to be **drained and disposed properly.**

ATTENTION! Components which may get in contact with the leakage have to be adequately protected.

▪ SAFETY

BURGMANN Mechanical Seals are manufactured on a **high quality level** and they keep a **high working reliability.** Yet, if they are **not operated** in accordance with their **intented purpose** or handled **unexpertly** by untrained personnel **they may cause risks.**

Not permitted is any operation mode that affects the **operational safety** of the mechanical seal.

The user is asked to check as part of his security program **what effects a failure** of the mechanical seal might have on the environment and what **additional safety measures** have to be taken **to prevent personal injury.**

The refiner must be positioned in a way that no persons are endangered if product has to be disposed properly.
BURGMANN mechanical seals must be operated, maintaned or repaired by **authorized, trained and instructed personnel only.**

Any person at the user's shop being involved in **assembly, disassembly, start up, operation and maintenance** of the BURGMANN Mechanical Seal must have read and understood this **Instruction Manual** completely; at least the respective important **paragraphs** and in particular the **safety notes**. We recommend the user to have this **confirmed** by the respective persons.

The responsibilities for the respective jobs to be done have to be determined clearly and **observed** in order to prevent unclear competencies from the point of **security.**
Mechanical seals are often used for sealing **hazardous substances** (chemicals, medical substances etc.). The valid **regulation for handling hazardous substances** have to be observed **by all means.**
Not permitted are unauthorised modifications or alternations which affect the **operational safety** of the mechanical seal.

▪ STORAGE

These instructions apply to all BURGMANN mechanical seals which have been supplied and stored in their undamaged original packing, as well as to seals which have been installed in a component of a plant (e.g. pump, compressor, agitator etc.) but have not yet been put into operation.
BURGMANN mechanical seals are super finished and tested machine elements whose handling before and during the storage period (in particular of spare parts) entails certain conditions. For elastomeric parts please refer to ISO 2230-1973(E).
Sliding materials and elastomers are subject to material-specific and time-based alternations (distortion, aging) which might reduce the full efficiency of the seals. Yet, this may be avoided by observing the storage instructions.
The mechanical seals have to be stored in dry, dustfree, moderately ventilated and tempered rooms. The relative air humidity should not exceed 65 %, and the temperature should be between 15°C and 25°C.

Direct exposure of the mechanical seal **to heat** (sun, heating) as well as **to ozone**, present or produced, **must be avoided** because of the **risk of embrittlement** of elastomeric materials. Especially **nitrile rubber (NBR, P)** has to be **protected from** exposure to sun rays or other **ultraviolet light** (halogen or fluorecent lamps).
A preservation of the BURGMANN mechanical seal is normally not necessary due to the materials used, but we recommend to store it at a dry place. **We explicitly do not recommend** to use corrosion protection agents as they might deposit or chemically effect the elastomer secondary seals which might result in a failure of the mechanical seal.

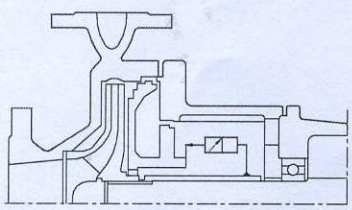
External influences on the packing (damage etc.) have to be avoided. The seals have to be stored exclusively in their original packing lying on a flat surface, if possible. Thus a protection from damage of the sensible parts is provided. If necessary, drying agents may be included in the packing by the manufacturer so that a controlled humidity within the original packing is ensured.

The packaging has to be periodically checked for damage. Packings with humidity indicators have to be checked every eight weeks which has to be recorded. Packings with humidity values exceeding 50% have to be sent to the manufacturer or service centre for new packaging and inspection.

After **a storage period of approximately two years** or after a damage of the packing or a shock of the mechanical seal (e.g. by dropping the seal) it should be **checked either at the manufacturer's** or at the nearest service centre. Kind and scope of the work to be done depend on the storage period and/or the kind of damage and are **determined by the manufacturer.**
Damages caused by improper storage may **not** be claimed on the BURGMANN company with reference **to their warranty.**

▪ PRELIMINARIES

All edges which will come into contact with the mechanical seal during installation must be chamfered sufficiently (i.e. 30° x 2 mm or in accordance with DIN 24960). All sharp edges must be radiused. O-ring fits have to be finished to a surface roughness of 10 µm (=N7 =CLA 63).
The shaft surface in the area of the dynamic O-ring must be finished to a surface roughness of 5 µm (= N6 =CLA32).
Shaft run-out in accordance with DIN ISO 5199: between 50 and 100 µm depending on the respective diameter.



To facilitate assembly, surfaces over which O-rings are to be fed may be thinly lubricated. Elastomers made of **EP-rubber must never come into contact with mineral oil or grease** - for reasons of chemical incompatibility.
When using double-PTFE-wrapped O-rings care has to be taken that the joint in the outer Teflon® wrapping points to the opposite direction as compared with the assembly direction.

▪ AUXILIARIES

- propyl alcohol + cellulose-tissue (no rag, no cloth!)
- lubricant for elastomer secondary sealing rings: >>**TURMOPOLGREASE SH2**<< make Lubricant Consult (LUBCON)
- anaerobic adhesive >>**LOCTITE® No. 241**<<, make LOCTITE Corp.
- O-ring lifter
- set of hexagon keys 2 mm to 6 mm
- hand screw press (compulsory for seal size > 80 mm)

▪ INSTALLATION

For installation the assembly drawing has to be on hand.
Do never force during installation.
Unpack the seal and check seal faces, O-rings and mating surfaces for damage.

▪ START UP

Flood refiner and seal cavity (stuffing box) with medium and vent thoroughly. The quenching fluid is not pressurized.

The flow rate must be controlled to ensure that the temperature of the buffer medium at the outlet lies below appr. 60°C and that it does not exceed boiling point under any circumstances.

The mechanical seal has to be constantly wetted **by the product in its liquid form,** in particular when the refiner is started or stopped. The pump design has to be such as to take this necessity into consideration (e.g. heating of the product).
If the operation limit values and the instructions given in this manual are observed a trouble-free operation of the mechanical seal can be expected.
Mechanical seals are often used for sealing **hazardous substances** (chemicals, medical substances etc.). The valid **regulation for handling hazardous substances** have to be observed **by all means.**
Medium may splash out if the seal fails. Personal injury may be **prevented by the user** providing for splash protection and wearing safety goggles. Care has to be taken by the user for **proper disposal** of the leakage.

▪ WRONG OPERATION

Operation under conditions laying **outside** those limits stated in paragraph **>> OPERATING LIMITS << is prohibited.** The mechanical seal should **not be operated under several** limiting values **at the same time** as there is the **risk of a seal malfuction** which could result in **danger for staff,** equipment and environment. Should the seal be operated under **conditions other** than those detailed **BURGMANN has to be asked for recognition as safe.**

▪ TROUBLES

Try to define the kind of failure and record it.
In case of failure due to high leakage the amount of leakage should be observed. Changes of the operation conditions have to be recorded. In case of an unacceptable temperature rise the mechanical seal must be shut down for reasons of safety.
During the warranty period the mechanical seal must only be disassembled or removed with BURGMANN's approval or when a BURGMANN representative is present.
If there is a malfuction which you cannot repair on your own, or if the cause of malfuction is not clearly recognizable please **immediately contact the nearest BURGMANN agency,** a BURGMANN service centre or the BURGMANN headquaters.

▪ MAINTENANCE

When operating mechanical seal according to the instructions in this manual, no maintenance will be necessary during the whole running time.
An inspection of the mechanical seal should be carried out during a revision of the complete plant. We recommend to have this inspection be performed by authorised BURGMANN personnel.
During revision of the complete plant the seal faces and the O-rings in their installed position should be subject to a visual control.
If the mechanical seal is disassembled during a revision of the plant the sliding faces should be refinished at the manufacturer and both, O-rings and springs should be replaced.

▪ REPAIR

If repair is necessary, the complete seal cartridge should be sent to the manufacturer, as this is the best way to find out which parts must be replaced.
If **reconditioning** at the manufacturer is not possible, it should **preferably** be carried out **by BURGMANN** service personnel or by **trained** personnel of the **user**. In any case all elastomers and springs as well as other secondary seals must be replaced.
For the **repair of used BURGMANN mechanical seals** when **disassembling** and **cleaning** the seal parts the valid **regulation for handling hazardous substances** and for **preventing accidents** have to be observed **by all means**. If there is any **unclear points** in this context the required **information** have to be **provided first before** starting repair.

▪ SPARE PARTS

We recommend to order spare parts from BURGMANN. Only **BURGMANN original parts** or **parts released** by BURGMANN must be used. Not **observing** these rules could cause the risks of a seal **failure endangering** persons and environment. The **guarantee** for the mechanical seal **lapses** automatically. We recommend to store a complete spare seal.

▪ AFTER SALES

The range of services offered by BURGMANN not only includes advice during the planning stages but also technical support after commissioning. This is supported by a world-wide comprehensive network off subsidiaries, field engineers and service centres.
Addresses of the BURGMANN subsidiaries, agencies, service centres and headquaters are listed on the inner cover page of the BURGMANN Design Manual as well as on various other BURGMANN brochures.

▪ COPYRIGHT

TIIVISTEKNIIKKA OY is a Finnish company specialized in BURGMANN seals and sealing technology for process industry. We design and manufacture under BURGMANN licence special seals. We sell standard and special seals.

▪ MANUFACTURER

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▪ DECLARATION

acc. to EC-directive "Machinery"

Herewith the manufacturer declares that the above described product is intented to be **incorporated into machinery** or assembled with other machinery to constitute machinery and does **not function independently.** It must not be put into service until the machinery into which it is to be incorporated has been declared to conformity with the provisions of the EC-directive >>MACHINERY<< (89/392/EEC). Applied harmonized standards: EN 292 part 1 and part 2.