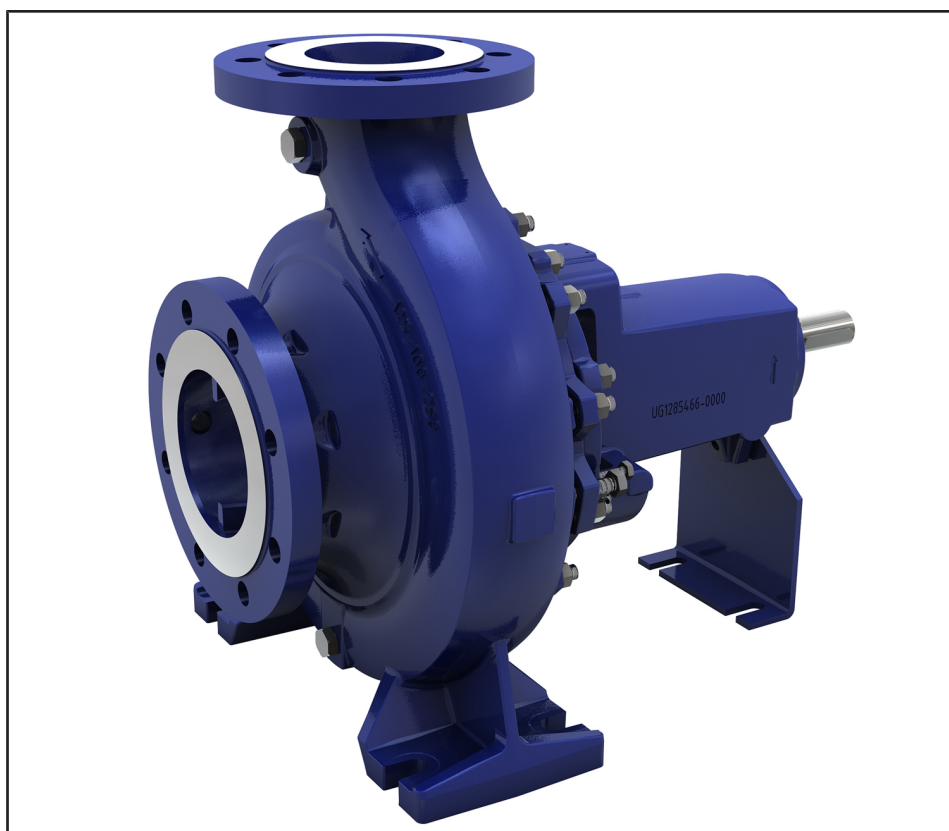


KSB Mechanical Seal

Double Mechanical Seals

Etabloc, Etanorm Type Series
Tandem Arrangement
with Quench Liquid

Supplementary Operating Manual



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Supplementary Operating Manual Double Mechanical Seals

Original operating manual

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1 Supplementary Operating Manual

1.1 General

This supplementary operating manual accompanies the installation/operating manual. All information contained in the installation/operating manual must be observed.

Table 1: Relevant operating manuals

Type series	Reference number of the installation/operating manual
Etabloc	1173.8
Etanorm	1311.8

1.2 Technical data

Design details The shaft is sealed by two balanced single bi-directional mechanical seals to EN 12756 in tandem arrangement with quench liquid.

Table 2: Material variant

Bearing bracket ¹⁾	Mechanical seal			
	Inboard, 433.01		Outboard, 433.02	
	Size and type of mechanical seal	Material variant	Size and type of mechanical seal	Material variant
WS25	KU028S / MG12G6-E1	Q1Q1EGG-G	KU028S / MG12G6-E1	Q1Q1EGG-G
WS35	KU038S / MG12G6-E1		KU038S / MG12G6-E1	
WS50				
WS60				
WS55	KU048S / MG12G6-E1		KU048S / MG12G6-E1	

Table 3: Material variant

Bearing bracket ¹⁾	Mechanical seal			
	Inboard, 433.01		Outboard, 433.02	
	Size and type of mechanical seal	Material variant	Size and type of mechanical seal	Material variant
WS25	KU028R1 / HN400N	Q1Q1M1GG	KU028S / MG12G6-E1	Q1Q1EGG-G
WS35	KU038R / MG37GN85	Q12Q1M1GG1	KU038S / MG12G6-E1	
WS50				
WS60				
WS55	KU048R / M37GN92		KU048S / MG12G6-E1	

Table 4: Material code

Position	Description	Code	Materials
1	Primary ring	Q1 Q12	SiC, silicon carbide, sintered without pressure
2	Mating ring	Q1	SiC, silicon carbide, sintered without pressure
3	Secondary seal	E	Ethylene propylene rubber (EPDM 80)
		M1	FPM, double PTFE-coated
4	Spring	G	CrNiMo steel
5	Other components	G	CrNiMo steel

¹ Refer to the data sheet for the bearing bracket used

1.3 Dismantling the shaft seal

- ✓ Dismantle the pump as described in operating manual 1311.8.
- ✓ The back pull-out unit has been placed in a clean and level assembly area.
 1. Pull off the rotating assembly of mechanical seal 433.01.
 2. Undo nuts 920.02 at seal cover 471. Slide the seal cover against the bearing bracket.
 3. Undo nuts 920.15 (if any) at casing cover 161.
 4. **On variants with a clamped casing cover:** Undo and remove transport locks 901.98. Remove casing cover 161 from bearing bracket 330.
 5. **For variants with a bolted casing cover:** Use forcing screws 901.31 to remove casing cover 161 from bearing bracket 330.
 6. Pull shaft sleeve 523 with the rotating assembly of mechanical seal 433.02 off shaft 210.
 7. Take seal cover 471 off shaft 210.
 8. Remove intermediate ring 509 with the stationary assembly (mating ring) of mechanical seal 433.01 from casing cover 161.
 9. Remove the stationary assembly (mating ring) of mechanical seal 433.01 and O-rings 412.15 from intermediate ring 509.
 10. Remove the stationary assembly (mating ring) of mechanical seal 433.02 from seal cover 471.
 11. Remove the rotating assembly of mechanical seal 433.02 with the thrust ring from shaft sleeve 523.
 12. Remove and dispose of gasket 400.75.

1.4 Fitting the shaft seal

Installing the mechanical seal

The following rules must be observed when installing the mechanical seal:


- Work cleanly and accurately.
- Only remove the protective wrapping of the contact faces immediately before installation takes place.
- Prevent any damage to the sealing surfaces or O-rings.
- ✓ Observe / carry out the notes and steps given in operating manual 1311.8.
- ✓ The bearing assembly as well as the individual parts are kept in a clean and level assembly area.
- ✓ All dismantled parts have been cleaned and checked for wear.
- ✓ Any damaged or worn parts have been replaced by original spare parts.
- ✓ The sealing surfaces have been cleaned.
 1. Clean shaft sleeve 523, and touch up any score marks or scratches with a polishing cloth, if necessary. If score marks or scratches are still visible, fit new shaft sleeve 523.



NOTE

To reduce friction forces when assembling the seal, wet the shaft sleeve and the location of the stationary ring with water.

2. Fit the rotating assembly of mechanical seal 433.02 with the supplied thrust ring on shaft sleeve 523.

	<div style="background-color: #FFD700; padding: 5px;">CAUTION</div> <p>Elastomers in contact with oil/grease Shaft seal failure!</p> <ul style="list-style-type: none"> ▷ Use water as assembly lubricant. ▷ Never use oil or grease as assembly lubricant.
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3. Carefully position the stationary assembly (mating ring) of mechanical seal 433.02 with the O-ring in seal cover 471. Make sure to apply pressure evenly.
4. Slide seal cover 471 onto shaft 210 until it rests against bearing bracket 330.
5. Carefully position the stationary assembly (mating ring) of mechanical seal 433.01 with the O-ring in intermediate ring 509. Make sure to apply pressure evenly.
6. Insert O-rings 412.15 in intermediate ring 509.
7. Fit intermediate ring 509 with O-rings 412.15 and the stationary assembly of mechanical seal 433.01 in the casing cover.
8. Slide shaft sleeve 523 together with the rotating assembly and new gasket 400.75 onto shaft 210.
9. **On variants with a bolted casing cover:** Screw back but do not remove forcing screws 901.31. Slide casing cover 161 with intermediate ring 509 onto bearing bracket 330. While doing so, gently slide seal cover 471 into casing cover 161.
10. Fit and tighten nuts 920.15 at casing cover 161.
11. **On variants with a clamped casing cover:** Slide casing cover 161 with intermediate ring 509 onto bearing bracket 330. While doing so, gently slide seal cover 471 into casing cover 161. Insert screws 901.98 (transport lock) into bearing bracket 331 and tighten them to fasten the casing cover.
12. Fit and tighten nuts 920.02 at seal cover 471.
13. Slide the rotating assembly of mechanical seal 433.01 onto shaft sleeve 523.
14. Carry out all other relevant steps given in operating manual 1311.8.

1.5 Quench liquid

1.5.1 Applications

A quench liquid is used in the following cases:

- Where a single mechanical seal without supportive measures would not work at all or unsatisfactorily.
- Where a double mechanical seal design with pressurised barrier fluid is not required.

1.5.2 Quench system arrangement

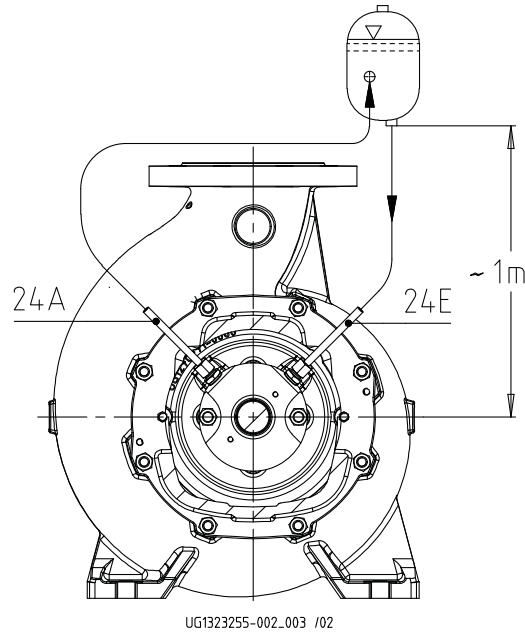


Fig. 1: Quench pot arrangement

Table 5: Connections

Connection ²⁾	Description	Size
24A	Quench liquid outlet	G 1/4
24E	Quench liquid inlet	G 1/4

Quench liquid from quench pot arranged above the seal: liquid circulated by means of thermosyphon effect or forced circulation.

1.5.3 Quench liquid requirements

The quench liquid should preferably form a solution with the fluid handled and be environmentally compatible.

Typical quench liquids

- Water with a conductivity of 100 - 800 $\mu\text{S}/\text{cm}$
- Water/glycol mixture
- Glycerine³⁾

The quench liquid should be supplied to the mechanical seals unpressurised (at atmospheric pressure), if possible. Positive pressures of up to 0.5 bar are acceptable.

The one-way quench supply should be adjusted to a constant flow ≥ 0.4 l/min.

Periodically check the quench liquid for contamination (replace quench liquid and clean quench system if necessary).

²⁾ Closed for transport

³⁾ Make sure the circulation line diameter is $\geq 1/4$ ".

1.6 General assembly drawing with list of components

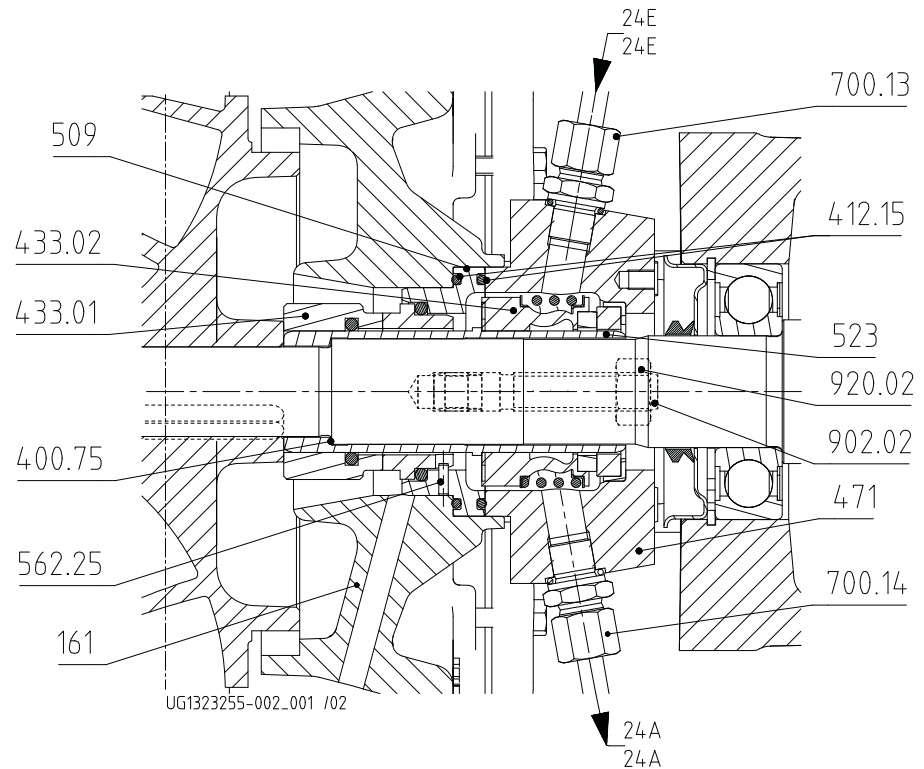


Fig. 2: Mechanical seal in tandem arrangement

Table 6: List of components

Part No.	Description
161	Casing cover
400.75	Gasket
412.15	O-ring
433.01	Mechanical seal (inboard)
433.02	Mechanical seal (outboard)
471	Seal cover
509	Intermediate ring
523	Shaft sleeve
562.25	Parallel pin
700.13/.14	Piping
902.02	Stud
920.02	Hexagon nut

Table 7: Connections

Connection ⁴⁾	Description	Size
24A	Quench liquid outlet	G 1/4
24E	Quench liquid inlet	G 1/4

⁴ Closed for transport



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