KSB Quench System

KWT51

Installation/Operating Manual

KSB

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Installation/Operating Manual KWT51

Original operating manual

Contents

1 General

1.1 Principles

This operating manual is valid for the type series and variants indicated on the front cover.

The operating manual describes the proper and safe use of this equipment in all phases of operation.

The name plate indicates the type series and main operating data. The order number and year of production clearly identify the thermosyphon system and serve as identification for all further business processes.

In the event of damage, immediately contact your nearest KSB service facility to maintain the right to claim under warranty.

1.2 Target group

This operating manual is aimed at the target group of trained and qualified specialist technical personnel.

1.3 Other applicable documents

Table 1: Overview of other applicable documents

Document	Contents
Data sheet	Description of the technical data of the pump (set) in which the KSB quench system is installed.
General arrangement drawing / outline drawing	Description of connections and installation dimensions for the KSB quench system, weights
General assembly drawing	Description of the KSB quench system as a sectional drawing
Sub-supplier product literature	Operating manuals and other product literature describing accessories and integrated machinery components

For accessories and/or integrated machinery components, observe the relevant manufacturer's product literature.

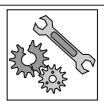
1.4 Symbols

Table 2: Symbols used in this manual

Symbol	Description
✓	Conditions which need to be fulfilled before proceeding with the step-by-step instructions
▷	Safety instructions
⇨	Result of an action
⇨	Cross-references
1. 2.	Step-by-step instructions
	Note Recommendations and important information on how to handle the product

1.5 Key to safety symbols/markings

Table 3: Definition of safety symbols/markings

Symbol	Description
DANGER	**DANGER** This signal word indicates a high-risk hazard which, if not avoided, will result in death or serious injury.
WARNING	**WARNING** This signal word indicates a medium-risk hazard which, if not avoided, could result in death or serious injury.
CAUTION	**CAUTION** This signal word indicates a hazard which, if not avoided, could result in damage to the machine and its functions.
	**Explosion protection** This symbol identifies information about avoiding explosions in potentially explosive atmospheres in accordance with EU Directive 2014/34/EU (ATEX).
	**General hazard** In conjunction with one of the signal words this symbol indicates a hazard which will or could result in death or serious injury.
	**Electrical hazard** In conjunction with one of the signal words this symbol indicates a hazard involving electrical voltage and identifies information about protection against electrical voltage.
	**Machine damage** In conjunction with the signal word CAUTION this symbol indicates a hazard for the machine and its functions.

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2 Safety

DANGER

All the information contained in this section refers to hazardous situations.

In addition to the present general safety information the action-related safety information given in the other sections must be observed.

2.1 General

- This operating manual contains general installation, operating and maintenance instructions that must be observed to ensure safe operation of the system and prevent personal injury and damage to property.
- Comply with all the safety instructions given in the individual sections of this operating manual.
- The operating manual must be read and understood by the responsible specialist personnel/operators prior to installation and commissioning.
- The contents of this operating manual must be available to the specialist personnel at the site at all times.
- Information and markings attached directly to the product must always be complied with and kept in a perfectly legible condition at all times. This applies to, for example:
  - Markings for connections
  - Name plate
- The operator is responsible for ensuring compliance with all local regulations not taken into account.

2.2 Intended use

- Consult the manufacturer about any use or mode of operation not described in the data sheet or product literature.
- This product must only be operated within the limit values stated in the technical product literature for the ambient temperature, density, pressure, temperature and in compliance with any other instructions provided in the operating manual or other applicable documents.
- The product must only be operated in the fields of application and within the use limits specified in the other applicable documents.

2.3 Personnel qualification and training

- All personnel involved must be fully qualified to install, operate, maintain and inspect the product this manual refers to.
- The responsibilities, competence and supervision of all personnel involved in transport, installation, operation, maintenance and inspection must be clearly defined by the operator.
- Deficits in knowledge must be rectified by means of training and instruction provided by sufficiently trained specialist personnel. If required, the operator can commission the manufacturer/supplier to train the personnel.
- Training on the product must always be supervised by specialist technical personnel.

2.4 Consequences and risks caused by non-compliance with this manual

- Non-compliance with these operating instructions will lead to forfeiture of warranty cover and of any and all rights to claims for damages.
- Non-compliance can, for example, have the following consequences:
  - Hazards to persons due to electrical, thermal, mechanical and chemical effects and explosions
  - Failure of important product functions
  - Failure of prescribed maintenance and servicing practices

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– Hazard to the environment due to leakage of hazardous substances

2.5 Safety awareness

In addition to the safety information contained in this operating manual and the intended use, the following safety regulations shall be complied with:

- Accident prevention, health regulations and safety regulations
- Explosion protection regulations
- Safety regulations for handling hazardous substances
- Applicable standards, directives and laws

2.6 Safety instructions for the operator/user

- Fit protective equipment (e.g. contact guards) supplied by the operator for hot, cold or moving parts, and check that the equipment functions properly.
- Do not remove any protective equipment (e.g. contact guards) during operation.
- Provide the personnel with protective equipment and make sure it is used.
- Contain leakages (e.g. at the shaft seal) of hazardous fluids handled (e.g. explosive, toxic, hot) so as to avoid any danger to persons and the environment. Adhere to all relevant laws.
- Eliminate all electrical hazards. (In this respect refer to the applicable national safety regulations and/or regulations issued by the local energy supply companies.)

2.7 Safety information for maintenance, inspection and installation

- Modifications or alterations are only permitted with the manufacturer's prior consent.
- Use only original spare parts or parts/components authorised by the manufacturer. The use of other parts/components can invalidate any liability of the manufacturer for resulting damage.
- The operator ensures that maintenance, inspection and installation are performed by authorised, qualified specialist personnel who are thoroughly familiar with the manual.
- Any work on the product shall only be performed when it has been disconnected from the power supply (de-energised).
- Carry out work on the product during standstill only.
- The product and its components (e.g. reservoir, piping) must have reached ambient temperature.
- When taking the product out of service always adhere to the procedure described in the operating manual.
- Decontaminate products which handle fluids posing a health hazard.
- As soon as the work has been completed, re-install and re-activate any safety-relevant devices and protective devices. Before returning the product to service, observe all instructions on commissioning. (⇨ Section 6.2, Page 16)
- Keep unauthorised persons (e.g. children) away from the product.
- Any welding work at the quench reservoir is prohibited.

2.8 Unauthorised modes of operation

Never operate the product outside the limits stated in the data sheet and in this manual.

The warranty relating to the operating reliability and safety of the product supplied is only valid if the product is used in accordance with its intended use.

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3 Transport/Storage/Disposal

3.1 Checking the condition upon delivery

1. On transfer of goods, check each packaging unit for damage.
2. In the event of in-transit damage, assess the exact damage, document it and notify KSB or the supplying dealer and the insurer about the damage in writing immediately.

3.2 Transport

DANGER

The KSB quench system could slip out of the suspension arrangement.

Danger to life from falling parts!

- Only transport the KSB quench system in the specified position.
- Observe the information on weights, centre of gravity and fastening points.
- Observe the applicable local accident prevention regulations.
- Use suitable and permitted transport equipment, e.g. crane, forklift or pallet truck.

CAUTION

Improper transport

Damage to the KSB quench system!

- Only transport the KSB quench system in suitable packaging.
- Observe the weights, symbols and instructions indicated on the packaging.
- Use suitable, approved lifting accessories.

Transport the KSB quench system carefully.

The original packaging is suitable for dry transport by forwarding agents (truck, rail, air).

3.3 Storage/preservation

If commissioning is to take place some time after delivery, we recommend that the following measures be taken:

CAUTION

Improper storage

Damage due to humidity, vermin, corrosion and contamination!

- Avoid outdoor storage.
- Observe, check and record the storage conditions.
- Regularly check the packaging for any damage.
- Regularly check the humidity indicator of shrink-wrapped objects. The relative humidity should be < 50 %.
- If the relative humidity indicated for shrink-wrapped objects > 50 %, have the equipment repacked by the manufacturer.

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CAUTION

Wet, contaminated or damaged openings and connections

Damage to the KSB quench system!

- ▷ Only open the screw plugs and connections of the KSB quench system during installation.
- ▷ Avoid opening screw plugs and connections before that time.

Store the KSB quench system in its original packaging, placed on a level surface in a dry, protected room in which the following conditions are consistent:

- Relative humidity < 65 %
- Temperature between 15 °C and 25 °C
- Moderately vented atmosphere
- Dust-free and vermin-free

New KSB quench systems are supplied by our factory duly prepared for storage.

3.4 Return to supplier

1. Prior to returning the product to the supplier, flush and clean it, particularly if it has been used in noxious, explosive, hot or other hazardous fluids.
2. If the product has been used in fluids whose residues could lead to corrosion damage in the presence of atmospheric humidity or could ignite upon contact with oxygen, the product must also be neutralised and treated with anhydrous inert gas to ensure drying.
3. Always complete and enclose a certificate of decontamination when returning the product. (⇨ Section 10, Page 27)
   Indicate any safety measures and decontamination measures taken.

NOTE

If required, a blank certificate of decontamination can be downloaded from the following web site: www.ksb.com/certificate_of_decontamination

3.5 Disposal

⚠ WARNING

Fluids, consumables and supplies posing a health hazard

Hazard to persons and the environment!

- ▷ Collect and dispose of any preservatives, flushing liquids and fluid residues.
- ▷ Wear safety clothing and a protective mask, if required.
- ▷ Observe all legal regulations on the disposal of fluids posing a health hazard.

1. Dismantle the product.
   Collect greases and other lubricants during dismantling.
2. Separate and sort the materials, e.g. by:
   - Metals
   - Plastics
   - Electronic waste
   - Greases and other lubricants
3. Dispose of materials in accordance with local regulations or in another controlled manner.

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4 Description

4.1 General description

- KSB quench system

The KSB quench system serves as an auxiliary system for mechanical seals installed in pump sets and other rotating machinery in accordance with the manufacturer's instructions.

4.2 Product information as per Regulation No. 1907/2006 (REACH)

For information as per chemicals Regulation (EC) No. 1907/2006 (REACH), see https://www.ksb.com/ksb-en/About-KSB/Corporate-responsibility/reach/ .

4.3 Designation

Table 4: Designation key

Code	Description	
KWT51	Reservoir design	
	KWT	Quench system to API Plan 51 and 52
F80014	Drawing number of the quench system	

4.4 Name plate

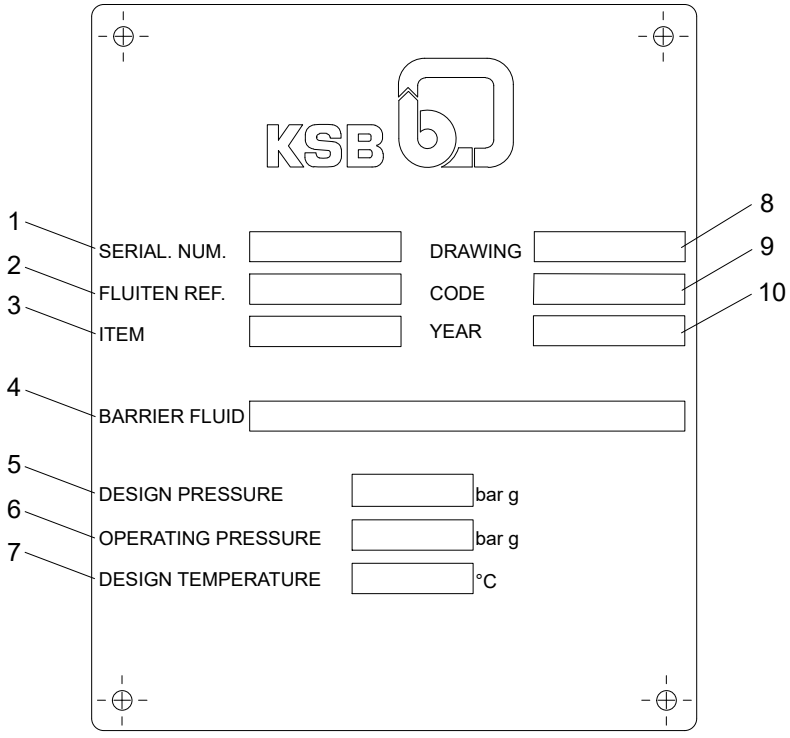


Fig. 1: Name plate (example)

1	Order-specific serial number	2	Order number of the manufacturer
3	Material number of the KSB quench system	4	Quench liquid
5	Permissible pressure	6	Working pressure
7	Permissible temperature	8	Drawing number of the manufacturer
9	ASME VIII Div. 1	10	Year of construction

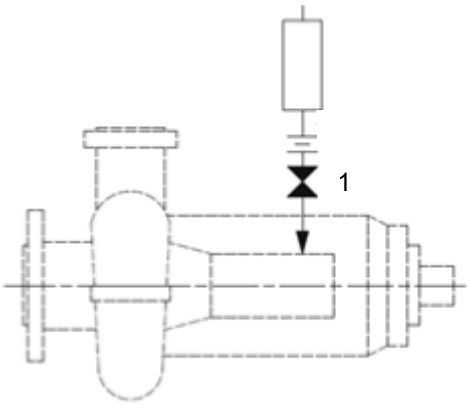
4.5 Design details

- KSB quench system
  - Quench reservoir
- Suitable for unpressurised quench liquid / buffer fluid, operating mode to API Plan 51 and 52
- Pressure Equipment Directive in accordance with 2014/68/EU
- Design code to ASME VIII Div. 1 Ed. 2015

4.6 Configuration and function

Design KSB quench systems are auxiliary systems for mechanical seals installed in pump sets and other rotating machinery. KSB's KWT51 quench system is used when a single mechanical seal requires a quench on the atmospheric side or a double mechanical seal requires an unpressurised buffer fluid.

Function The quench system is an auxiliary system for single mechanical seals and double mechanical seals. Single seals combined with API Plan 51 operating mode are used with a quench liquid. The quench liquid prevents any ice from forming on the atmospheric side of the single seal or on the atmospheric side of the inboard mechanical seal. In the case of dissolved salts, crystallisation of the fluid handled is prevented on the atmospheric side of the single seal. In the operating mode to API Plan 51 and API Plan 52 the quench liquid / buffer fluid prevents the fluid handled from coming into contact with air. Another function is the absorption of mechanical seal leakage. The fluid handled is prevented from coming into contact with oxygen or humidity in the air. In the operating mode to API Plan 52 the quench liquid is used as unpressurised buffer fluid for a double mechanical seal.



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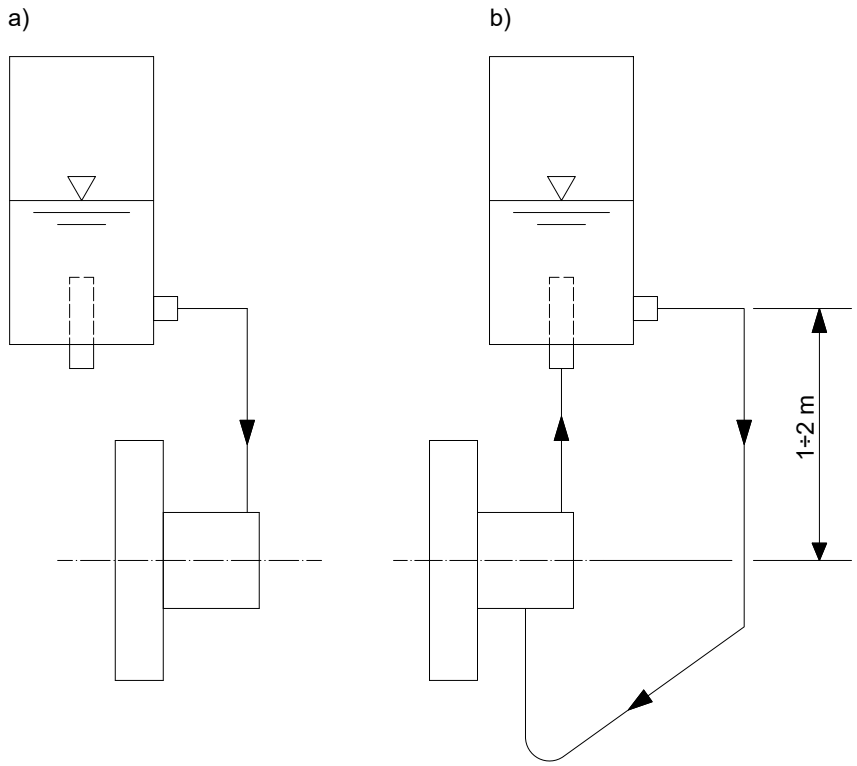
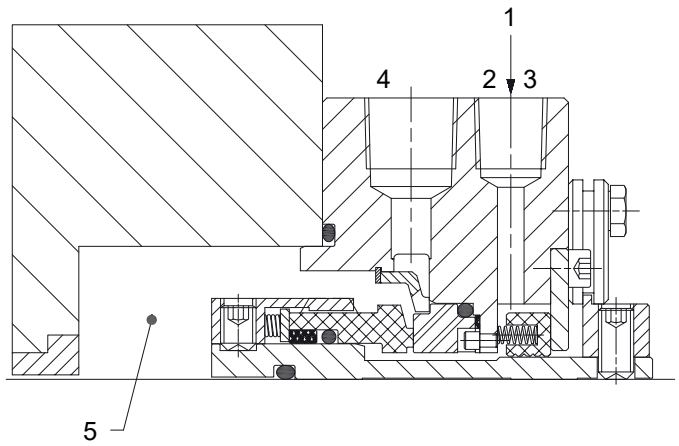


Fig. 2: a) Operating mode to API Plan 51
b) Operating mode to API Plan 52



Part No.	Description	Part No.	Description
1	From the quench reservoir to the seal	4	Flush (F)
2	Quench (Q)	5	Seal chamber
3	Drain (D)		

The quench liquid is contained in the reservoir of the KWT51 quench system. A rapid rise of the quench liquid fill level over a short time, visible in the sight glass of the quench system's reservoir, indicates possible mechanical seal damage. The reservoir of the quench system is made of stainless steel 316/L.

For a single seal with operating mode to API Plan 51 a single seal with a lip seal is used. Alternatively, specific throttle bushes suitable for sealing off liquids can be used.

The quench liquid can be topped up via the cap of the quench system's reservoir, which is required for compensating any loss caused by leakage. The quench liquid can also be replaced via this cap. Replacing the quench liquid is recommended when the fill level in the sight glass of the quench reservoir has exceeded the maximum fill level. Checking the mechanical seal in addition is recommended.

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5 Installation at Site

5.1 Determining the position of the quench reservoir

NOTE

As a rule, the reservoir should be mounted 0.8 m above the mechanical seal.

5.2 Aligning and fastening the quench reservoir

1. Attach the quench reservoir to the stand/bracket using the mounting unit on the back of the KSB quench system and bolts/nuts.

5.3 Connections to the mechanical seal

1. Install the quench reservoir as close as possible to the mechanical seal.
   - ⇨ Avoid tight curves, kinks and complicated circuits to reduce passive resistances and pressure losses in the circuit.
   - ⇨ Lay the piping with a continuously rising slope to prevent air from accumulating in the piping.
2. Ensure that no shut-off elements are installed in the circuit which could interrupt the fluid circulation.

5.4 External connections to the KSB quench system

Operating mode to API Plan 51: application for single mechanical seal

- Threaded connection to the mechanical seal (A)
- Cap for filling in / topping up quench liquid
- Sight glass for checking the fill level

Operating mode to API Plan 52: application for double mechanical seal

- Threaded connection to the mechanical seal (A)
- Threaded connection from the mechanical seal to the quench system (B)
- Cap for filling in / topping up quench liquid
- Sight glass for checking the fill level

1. A shut-off valve can be installed underneath the quench reservoir to isolate the quench system for any maintenance work.

6 Commissioning/Start-up/Shutdown

6.1 Safety instructions for operation

⚠ WARNING

Hot surfaces

Risk of burns!

- ▷ Do not touch the surface of the KSB quench system and associated components.

CAUTION

Placing loads on the quench reservoir

Damage to or failure of the quench system!

Damage to or failure of the mechanical seal!

- ▷ Never place a load > 3 kg on the quench reservoir.

6.2 Commissioning/Start-up

6.2.1 Prerequisites for commissioning/start-up

⚠ WARNING

Improper assembly / dismantling

Damage to the KSB quench system!

Damage to the mechanical seal!

Fluid handled escaping!

- ▷ Have installation / dismantling of the KSB quench system carried out by authorised and qualified personnel only.

CAUTION

Vibrations during operation

Fatigue fracture of the piping!

Fluid handled escaping!

Mechanical seal failure!

- ▷ Carry out a vibration analysis prior to installation. If in doubt, contact the manufacturer.

Before commissioning / starting up the KSB quench system, ensure that the following requirements are met:

- The KSB quench system has been properly connected mechanically.
- All auxiliary connections required are connected and operational.
- After prolonged shutdown of the pump (set), the activities required for returning the equipment to service have been carried out.

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6.2.2 Selecting the quench liquid / buffer fluid

⚠ DANGER

Contact with toxic, flammable, explosive or hot quench liquid / barrier fluid

Risk of injury, e.g. chemical burns on the skin and in the eyes, poisoning and burns!

- ▷ Observe the relevant safety instructions, e.g. safety data sheets, for the handling of hazardous substances (wear safety goggles, protective gloves, protective clothing, etc. if required).
- ▷ Wear personal protective equipment (e.g. safety goggles, protective gloves, protective clothing, etc).
- ▷ Collect and properly dispose of the quench liquid / buffer fluid.
- ▷ Remove any quench liquid / buffer fluid residues from the KSB quench system and flush the system thoroughly.

CAUTION

Use of non-approved fluids

Interaction between quench liquid / buffer fluid and fluid handled!

- ▷ Only use the fluids listed in the order documentation.
- ▷ If in doubt, contact the manufacturer of the fluids.

When selecting the buffer fluid[1)] observe the following:

- Additives which inhibit wear and/or oxidation are often found in commercial turbine oils and can lead to deposits on the seal faces.
- Use a clean buffer fluid[1)] not containing any foreign matter.
- The buffer fluid[1)] should have flow characteristics which prevent the formation of deposits or residues.
- The buffer fluid[1)] should prevent the formation of ice and keep salts dissolved.
- The buffer fluid[1)] should prevent any contact between the fluid handled and atmosphere or reduce the absorption of humidity by the fluid handled.
- It should be resistant to ageing.
- It should be stable at the applicable operating temperature and operating pressure.
- Avoid fluids susceptible to evaporation, hardening and foaming.
- Ensure compatibility with the fluid handled. If the inboard mechanical seal fails, the two fluids may come into contact with each other.
- Buffer fluid escaping to[1)] atmosphere must be acceptable.

Table 5: Preferred buffer fluid[1)]

Buffer fluid[1)]	Function of the buffer fluid[1)]	Operating temperature [°C]
Ethylene glycol	Preventing the formation of ice	-40 to +100
Light oils (viscosity 2 – 3°E at 50 °C)	Absorbing leakage or lubricating the seal faces	-10 to +120
Water	Diluting salts contained in leakage	10 to 80
Water + ethylene glycol	Diluting salts contained in leakage and preventing the formation of ice	-20 to 100° C (70 %/30 %) -35 to 110° C (50 %/50 %)

1 Quench liquid / buffer fluid

Buffer fluid[1)]	Function of the buffer fluid[1)]	Operating temperature [°C]
Water + propylene glycol	Diluting salts contained in leakage and preventing the formation of ice	-15 to 100° C (70 %/30 %) -30 to 110° C (50 %/50 %)
Hydrophobic liquids (isodecane, perfluorinated polyether, etc.)	Preventing contact with atmospheric humidity	-50 to +50

6.2.3 Commissioning / starting up the KSB quench system with unpressurised quench liquid / buffer fluid, operating mode to API Plan 51 or API Plan 52

⚠ WARNING

Improper lifting during installation and maintenance work

Risk of injury!

Damage to the KSB quench system!

- ▹ Select suitable and approved lifting equipment and lifting accessories for the weight of the KSB quench system.
- ▹ Always attach lifting accessories to the intended fastening points.
- ▹ Ensure the load is properly secured!
- ▹ Move the KSB quench system carefully.
- ▹ Observe the applicable accident prevention regulations.

NOTE

To prevent the mechanical seal from running dry, the pump must be filled with the fluid handled at operating pressure.

✓ The KSB quench system is installed as specified.

✓ Order documentation including drawings is available. (⇨ Section 9, Page 25)

1. Open the cap located on top of the quench reservoir.
2. Fill the quench system's reservoir with the fluid selected for operation. The fill level in the sight glass is between the minimum and maximum levels. Compare related order documentation.
   - ⇨ Open the vent valve (if applicable) during the filling process.
   - ⇨ After the filling process is completed, close the vent valve.
3. Close the cap on top of the quench reservoir.
4. Check all piping connections for leakage and remedy if necessary.
5. Prevent any air from being trapped between the quench reservoir and the KSB mechanical seal.

⇨ The KSB quench system is ready for operation.

6.3 Operating limits

Mandatory operating parameters and relevant application limits are clearly specified in the order documentation, on the name plate and in the associated drawings . Non-compliance with the application limits shall void the KSB quench system's warranty.

1. All application limits must be observed; consult the manufacturer if necessary.
2. Final inspection documents must be stored carefully.
3. The operator must ensure that pressure and temperature limits are observed.
4. Never use the quench "in vacuum".

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Table 6: Application limits of the KSB quench system

Characteristic	Unit	Limit
Permissible pressure	[bar g]	Unpressurised
Permissible temperature	[°C]	-40 to +120
Capacity	[l]	3,00

In addition, the Pressure Equipment Directive 2014/68/EU applies with the following categories:

Table 7: Categories according to Pressure Equipment Directive 2014/68/EU

Page	Fluid state	Fluid group	Table	Risk category	Pressure equipment module
Shell side	G+L	1	1	Art. 4 Sect. 3	

6.4 Shutdown/storage/preservation

6.4.1 Measures for dismantling

⚠ WARNING

Fluids handled, consumables and supplies which are hot and/or pose a health hazard

Hazard to persons and the environment!

- ▷ Collect and properly dispose of flushing fluid and any residues of the fluid handled.
- ▷ Wear safety clothing and a protective mask if required.
- ▷ Observe all legal regulations on the disposal of fluids posing a health hazard.

⚠ WARNING

Improper assembly / dismantling

Damage to the KSB quench system!

Damage to the mechanical seal!

Fluid handled escaping!

- ▷ Have installation / dismantling of the KSB quench system carried out by authorised and qualified personnel only.

✓ The pump set has been shut down in accordance with the operating manual.

✓ The fluid in the quench reservoir has cooled down.

✓ A suitable container for collecting the fluid from the quench reservoir is available.

1. Connect the connecting line to the "DRAIN" connection[2)] and guide it to the drain pan.
2. Open the drain unit (e.g. ball valve)[2)].
3. Flush the KSB quench system with a suitable liquid.
4. Properly dispose of the fluids collected.
5. Close the drain unit[2)] to prevent the escape of residual liquid or the ingress of dirt.
6. Dismantle the piping.
7. Remove the KSB quench from the system.

2 If any

6.4.2 Measures to be taken for shutdown

For a shutdown, ensure the measures for dismantling are properly implemented.

- For a short-term shutdown (1 to 2 months) the buffer fluid remains in the system.
- For a longer shutdown drain the buffer fluid and preserve the quench reservoir.

6.4.3 Returning to service

⚠ WARNING

Failure to re-install or re-activate protective devices

Risk of injury from moving parts or escaping fluid!

▷ As soon as the work is completed, properly re-install and re-activate any safety-relevant devices and protective devices.

Before returning the KSB quench system to service, implement the following measures:

1. Observe and take all measures required to return the pump sets to service (see operating manual of the pump set).
2. For returning the equipment to service observe the sections on commissioning/ start-up .

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7 Maintenance

7.1 Safety regulations

⚠ WARNING

Improper lifting during installation and maintenance work

Risk of injury!

Damage to the KSB quench system!

- ▷ Select suitable and approved lifting equipment and lifting accessories for the weight of the KSB quench system.
- ▷ Always attach lifting accessories to the intended fastening points.
- ▷ Ensure the load is properly secured!
- ▷ Move the KSB quench system carefully.
- ▷ Observe the applicable accident prevention regulations.

CAUTION

Cleaning the 316/L stainless steel quench reservoir

Corrosion or damage to the KSB quench reservoir!

- ▷ Only use suitable fluids for cleaning.

NOTE

The legal regulations for the operation of pressure equipment of the respective country of installation apply to all maintenance, servicing and installation work without exception.

A regular maintenance schedule will help avoid expensive repairs and contribute to trouble-free, reliable operation of the pump, pump set and pump parts with a minimum of servicing/maintenance expenditure and work.

NOTE

All maintenance work, service work and installation work can be carried out by KSB Service or authorised workshops. For contact details refer to the enclosed "Addresses" booklet or visit "www.ksb.com/contact" on the Internet.

7.2 Maintenance/inspection

The operator ensures that maintenance, inspection and installation are performed by authorised, qualified specialist personnel who are thoroughly familiar with the manual.

CAUTION

Fill level in quench reservoir too low

Damage to the KSB quench system!

- ▷ The fill level in the quench reservoir must never drop below the specified minimum level during operation. Cf. order documentation and associated drawings. (⇨ Section 9, Page 25)

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CAUTION

Using previously used sealing elements

Damage to the KSB quench system!

- ▹ All sealing elements must be replaced whenever the flange connections are separated.
- ▹ The use of previously used sealing elements is not permitted.

CAUTION

Removing the sight glass of the quench reservoir

Loss of quench liquid!

- ▹ When the sight glass of the quench reservoir is removed, the corresponding sealing element always has to be replaced.

1. Check the fill level in the quench reservoir: every 48 operating hours
   - ⇨ If the fill level in the quench reservoir has dropped to the minimum level, top it up with the corresponding buffer fluid . (⇨ Section 6.2, Page 16)
2. Check the surface of the quench reservoir for corrosion: once a year
   - ⇨ Perform checks more frequently if light oil or glycol are used as the buffer fluid .
   - ⇨ The measured wall thickness must not be less than indicated in the order documentation incl. drawing. (⇨ Section 9, Page 25)
   - ⇨ The quench reservoir has no special opening for inspecting the interior. If necessary, this can be performed with an endoscope.
3. Perform regular checks to ensure that the return line, which runs from the mechanical seal to the reservoir, has a higher temperature than the supply line. This ensures effective circulation of the buffer fluid .
4. Regularly check the piping.

NOTE

Each quench reservoir is equipped with a name plate displaying the most important technical data (e.g. operating and application limits).

In normal operation of the pump (set), checking the fill level is sufficient to ensure correct operation.

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7.3 Drainage/cleaning

⚠ WARNING

Fluids handled, consumables and supplies which are hot and/or pose a health hazard

Hazard to persons and the environment!

- ▷ Collect and properly dispose of flushing fluid and any residues of the fluid handled.
- ▷ Wear safety clothing and a protective mask if required.
- ▷ Observe all legal regulations on the disposal of fluids posing a health hazard.

✓ The pump set has been shut down in accordance with the operating manual.

✓ The fluid in the quench reservoir has cooled down.

✓ A suitable container for collecting the fluid from the quench reservoir is available.

1. Connect the connecting line to the "DRAIN" connection[3)] and guide it to the drain pan.
2. Open the drain unit[3)] (e.g. ball valve).
3. Flush the KSB quench system with a suitable liquid.
4. Properly dispose of the fluids collected.
5. Close the drain unit[3)] to prevent the escape of residual liquid or the ingress of dirt.

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3 If any

8 Trouble-shooting

⚠ WARNING

Improper work to remedy faults

Risk of injury!

- ▷ For any work performed to remedy faults, observe the relevant information given in this operating manual and/or in the product literature provided by the accessories manufacturer.

NOTE

Consult the manufacturer before working on the KSB quench system during the warranty period.
KSB's service staff will be pleased to help you. Non-compliance will lead to forfeiture of any and all rights to claims for damages.

NOTE

For any failures you cannot remedy or whose cause cannot be identified, contact the responsible KSB service centre.

What to do in the event of a fault/malfunction

- Determine and document the nature of the fault/malfunction.
- Monitor the development of leakage quantity. If necessary, shut down the pump as described in the operating manual.
  A steady flow of leakage indicates mechanical seal damage.

Maintenance work, service work and installation work by KSB Service

- KSB Service GmbH | Service Center Pegnitz
  E-mail: service-center.pegnitz@ksb.com
- KSB Service LLC | Service Center Abu Dhabi
  E-mail: ksb@ksb.ae

Contact for general queries:

- E-mail: LPC_Mechanical.Seals@ksb.com

Further contact addresses:

- www.ksb.com/contact

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9 Related Documents

9.1 General drawings with list of components

9.1.1 KSB quench system KWT51F80014

KSB quench system with operating mode to API Plan 51 or API Plan 52

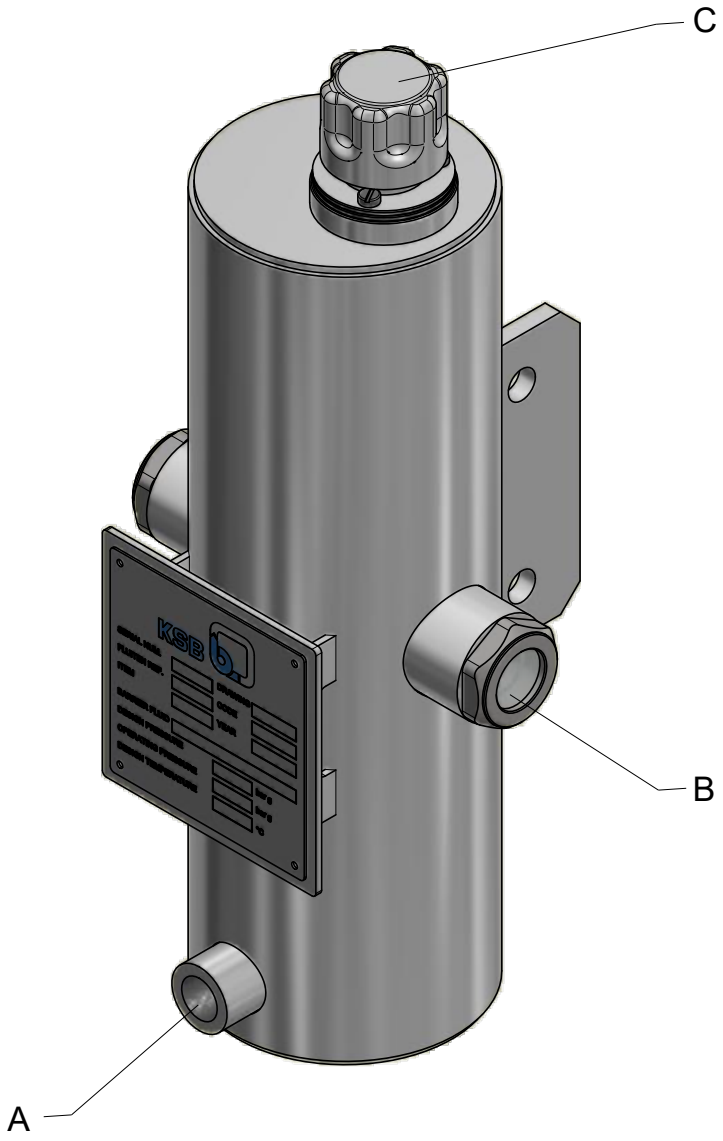

Fig. 3: General arrangement drawing, example KWT51F80014

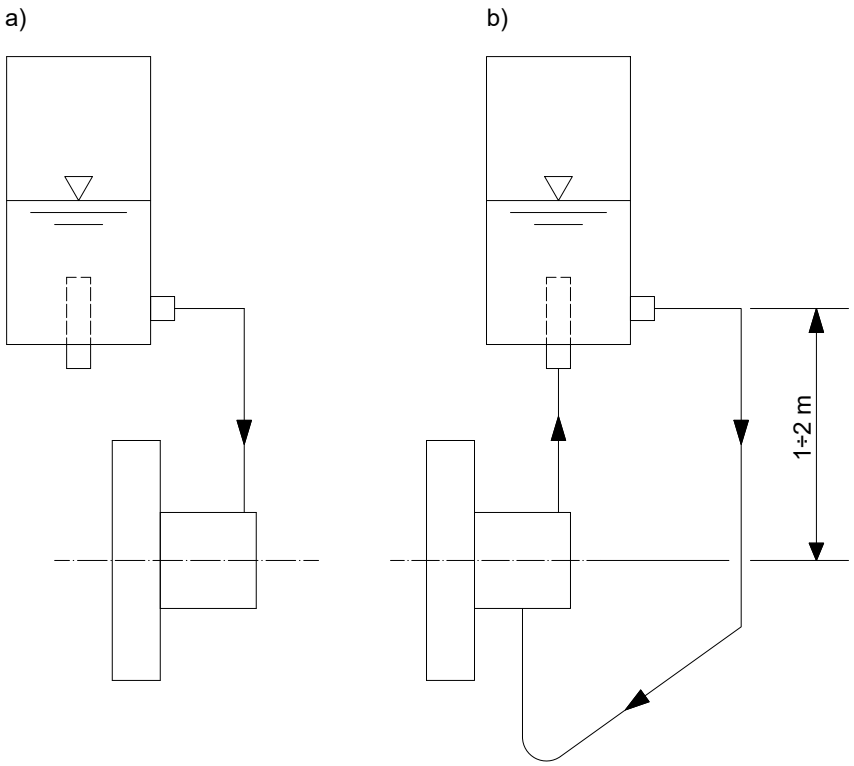

Fig. 4: Flow diagram a) API Plan 51 b) API Plan 52

Table 8: List of components

Part No.	Nominal diameter	Type	Description
A	1/2"	Gas	Piping from the outlet of the mechanical seal cover to the quench reservoir
B	1/2"	Gas	Piping from the quench reservoir to the inlet of the mechanical seal cover
C	25 mm	-	Opening for topping up

9.2 Drawings and general arrangement drawings for the Etanorm type series

Table 9: Scope of supply of quench system for Etanorm type series

Quench system		Delivery	KSB drawing number[4] for general arrangement drawing
QS	QS-KWT 51	Individual parts without bracket supplied but not fitted	UG 1732281
		Individual parts with bracket supplied but not fitted	UG 1730993 D01/D02
		Fully pre-assembled with bracket	UG 1730993 D01/D02

Table 10: Assembly drawing for quench system or barrier fluid system for Etanorm type series

Quench liquid / barrier fluid system	Special feature	KSB drawing number[4] for general arrangement drawing
QS and SDS	Holes for baseplates	UG 1781995

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4 Cf. with supplied order documentation

10 Certificate of Decontamination

Type: .....

Order number /

Order item number[5]: .....

Delivery date: .....

Application: .....

Fluid handled[5]: .....

Please tick where applicable[5]:

☐ Corrosive

☐ Oxidising

☐ Flammable

☐ Explosive

☐ Hazardous to health

☐ Seriously hazardous to health

☐ Toxic

☐ Radioactive

☐ Bio-hazardous

☐ Safe

Reason for return:[5]: .....

Comments: .....

.....

The product / accessories have been carefully drained, cleaned and decontaminated inside and outside prior to dispatch / placing at your disposal.

We herewith declare that this product is free from hazardous chemicals and biological and radioactive substances.

For mag-drive pumps, the inner rotor unit (impeller, casing cover, bearing ring carrier, plain bearing, inner rotor) has been removed from the pump and cleaned. In cases of containment shroud leakage, the outer rotor, bearing bracket lantern, leakage barrier and bearing bracket or intermediate piece have also been cleaned.

For canned motor pumps, the rotor and plain bearing have been removed from the pump for cleaning. In cases of leakage at the stator can, the stator space has been examined for fluid leakage; if fluid handled has penetrated the stator space, it has been removed.

☐ No special safety precautions are required for further handling.

☐ The following safety precautions are required for flushing fluids, fluid residues and disposal:

.....

.....

We confirm that the above data and information are correct and complete and that dispatch is effected in accordance with the relevant legal provisions.

.....	.....	.....
Place, date and signature	Address	Company stamp

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5 Required field

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