

Operating Manual

Drawing no.:

EB SSS

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1 About this publication

1.1 Scope and designations

The product named on the title page will be called system in the following.

Mechanical seals are referred to as seals in the following.

This operating manual applies to the system specified on the title page.

1.2 Referenced documents

This operating manual only applies in conjunction with the following documents, if supplied:

- An assembly drawing of the system (referred to as 'drawing' in the following)
- A P&ID (flow) diagram
- An equipment list and associated data sheets
- A terminal diagram
- Operating instructions for the non-EagleBurgmann equipment. The designation "non-EagleBurgmann equipment" refers to all non-EagleBurgmann components.
- Order documents

A list of the referenced documents for the applicable system can be found in the order documents.

The important factor is the version of the drawing at the time the system and associated documentation were supplied.

1.3 Target group

This operating manual is aimed at anyone who is involved with the following activities on the system:

- Transportation
- Storage
- Assembly
- Disassembly
- Starting up
- Operation
- Servicing
- Disposal

1.4 Representation conventions

The following notes are used in the document:

 DANGER	Indicates dangerous situations that will result in death or severe injuries if they are not avoided.
 WARNING	Indicates dangerous situations that could result in death or severe injuries if they are not avoided.
 CAUTION	Indicates dangerous situations that could result in minor injuries if they are not avoided.
CAUTION	Indicates special notes and precautionary measures that could result in damage to property if they are not followed.
NOTE	Additional note or information

- ⇒ Identifies a non-specific action instruction.
- ✓ Identifies a specific action instruction.
- Identifies requirements
- Identifies the results of actions
 - ▷ Identifies interim results

Refers to a page with more detailed information

- Identifies checklists
 - List

2 Safety

2.1 Read the operating manual

The operating manual is part of the system. Failure to follow the operating manual and the following safety instructions can result in injuries and damage to property.

- ⇒ Follow the complete operating manual.
- ⇒ Take account of and follow the referenced documents at all times.
- ⇒ Keep the operating manual accessible at all times.
- ⇒ Observe the instructions and documentation from the manufacturers of non-EagleBurgmann equipment.

2.2 Intended use

EagleBurgmann supply systems are supply units for seals.

The system is intended exclusively for the specified application. *See section 4 Technical data. See section 1.2. Referenced documents.*

Any other or more extensive usage can result in injury and damage to property.

- ⇒ Do not exceed the operating limits set out in section 4.

2.3 Improper use

The following uses are not permitted and can result in injury and damage to property:

- Operating the system in an improper state (e.g. operating parameters not matched to the system, transfer points and valves not matched to the system and tested).
- Removing, bypassing or deactivating safety equipment and guards.
- Incorrectly carrying out maintenance, repair and servicing measures.
- Carrying out repair, cleaning or maintenance work without switching off the system and physically isolating the power supply.
- Using the system as a step (e.g. to access the tank or pipes).
- Making own structural changes, e.g. attachments and conversions, without first discussing them with EagleBurgmann.
- Operating the system with faulty safety equipment.
- Operating the system with an obvious fault.
- Failing to follow the safety instructions in this document and the referenced documents.
-
- Using the system as an active controller for the plant. The measured values are for information only.

2.4 Personnel requirements

People who work with the system must meet the following minimum requirements:

- They have been instructed in how to use the system.
- They are able to carry out the work associated with this document and the referenced documents in a safety-conscious manner.
- They are able to recognize and avoid the risks of the work.

Failure to meet the minimum requirements can result in injuries and damage to property. EagleBurgmann offers seminars to obtain the required skills.

People who work with the system must wear protective equipment (PPE), such as ear defenders and breathing apparatus.

2.5 Requirements of the machine manufacturer and the owner

The machine manufacturer and the owner must check the effects that a failure of the system could have and whether safety measures must be taken to protect people and the environment. Failure to carry out the safety measures can result in injuries and damage to property.

The way in which the system is incorporated into the higher level plant will determine whether it is safe to operate.

The machine manufacturer or the owner must ensure that:

- The system is incorporated into the higher-level plant in accordance with the operating manual and does not jeopardize operational safety.
- The electrical components are connected to suitable facilities, e.g. control room, with due regard to the manufacturer's connected loads.

- The residual risks are known and have been eliminated by suitable measures.

2.6 Hazards

2.6.1 Danger from using unauthorized components

Structural changes to the system or use of unsuitable components can result in malfunctions. These lead to injuries or damage to property.

- ⇒ Do not convert or modify the system.
- ⇒ Use genuine EagleBurgmann spare parts.

2.6.2 Danger from media discharged during work on the installed system

Installed systems may be pressurized. Media can be discharged during work on installed systems and cause severe or potentially fatal injury and damage to property.

- ⇒ All work on an installed and pressurized system that is not for monitoring purposes should be carried out in the unpressurized and de-energized state.
- ⇒ Prevent the system being switched on again unintentionally.

2.6.3 Danger from explosive atmosphere

Explosions may occur during use in the potentially explosive area and cause potentially fatal injury and damage to property. To prevent this, observe the following:

- ⇒ Ground the system.
- ⇒ Only a damp cloth to wipe and clean non-metallic surfaces, e.g. inspection windows or plastic housings.
- ⇒ Use anti-static cleaning cloths.
- ⇒ Only use category IIA and IIB substances to avoid potential ignition due to static discharge. Brush discharge is possible through paint coating thicknesses > 0.2 mm.
- ⇒ If the system contains circulating pumps, do not allow them to run dry.
- ⇒ The ignition temperature of dust must be at least 75 K higher than the permitted operating temperature.
- ⇒ Observe the safety instructions concerning unauthorized components. *See section 2.6 Danger from using unauthorized components.*

2.6.4 Danger from discharged media

Failure of the system may result in medium (liquid or gaseous) being discharged. The medium may be hot or cold, under high pressure and potentially harmful to the health. This can cause severe or potentially fatal injury and damage to property.

- ⇒ Initiate protective measures, such as:
 - Ventilate the rooms.
 - Wear personal protective equipment.
 - Check the gas concentration.

2.6.5 Danger from materials

The materials of EagleBurgmann components may contain hazardous substances; contact with such substances can cause poisoning, corrosion burns, allergic reactions, damage to the immune system and other health damage.

- ⇒ Consider and eliminate the cause of chemical reactions between the components of the system and the media used (process media / supply media).
- ⇒ Observe the notes on the delivery note and confirmation of order.
- ⇒ Initiate protective measures. Observe the safety data sheets for the hazardous substances.

2.6.6 Danger from the media used

Accelerated corrosion or secondary seal decay can result in damage to the system. This can cause severe or potentially fatal injury and damage to property.

- ⇒ The chemical resistance of components that come into contact with media, such as pressure vessels, secondary seals and sight glass, should be checked by the owner.

2.6.7 Danger from sharp edges and crushing

Joining the system to the higher level system can be a source of risk to people, for example due to positioning and swinging movements, or lack of freedom of movement. This can result in crushing of the hands or other limbs.

- ⇒ Use suitable aids.
- ⇒ Make sure you have a clear space in which to work.

2.6.8 Danger from hot or cold surfaces

Hot or cold surfaces, e.g. pipes, tanks or electrical components, can cause injury and damage to property.

- ⇒ Attach suitable insulation or warning notices to the system.
- ⇒ Do not remove safety and warning notices and keep them in a legible condition.

2.6.9 Danger from electricity

Faulty grounding or assembly of electrical components can cause severe or potentially fatal injury and damage to property due to electricity.

- ⇒ Check the grounding, wiring and components.

2.7 Standards and directives

The system has been built to the current technical standards and is safe to operate. All safety information in this documentation relates to the applicable national laws and regulations of the European Union.

2.8 Warranty and liability

No warranty claims or liability claims for personal injury or damage to property shall be accepted if they are attributable to one or more of the following causes:

- Improper use of the system.
- Improper transport, storage, assembly, disassembly, start-up, shut down, operation, and maintenance of the system.
- Structural change to the system without written approval from EagleBurgmann.
- Failure to follow the general safety instructions, warning instructions and referenced documents.
- Improper repair.

EagleBurgmann shall only assume the warranty and liability for material and manufacturing defects.

3 Description

3.1 Description of the functions

The system represents a special sensor solution developed for monitoring mechanical seals and is used to measure the following operating parameters:

- Temperature
- Pressure
- Vibration

The system is battery-operated.

The system should be operated with a dedicated gateway.

The data transfer is wireless.

Status information is displayed by a flashing light.

Event	Description	LED status
Switch on	First LED signal after starting	Brief flashing green: Self test successful Brief flashing red: Self test failed
Reset	No network connected	Continuous fast flashing red
Wake-up interval	Network status	Brief flashing green: Connected to network Brief flashing red: Not connected to network

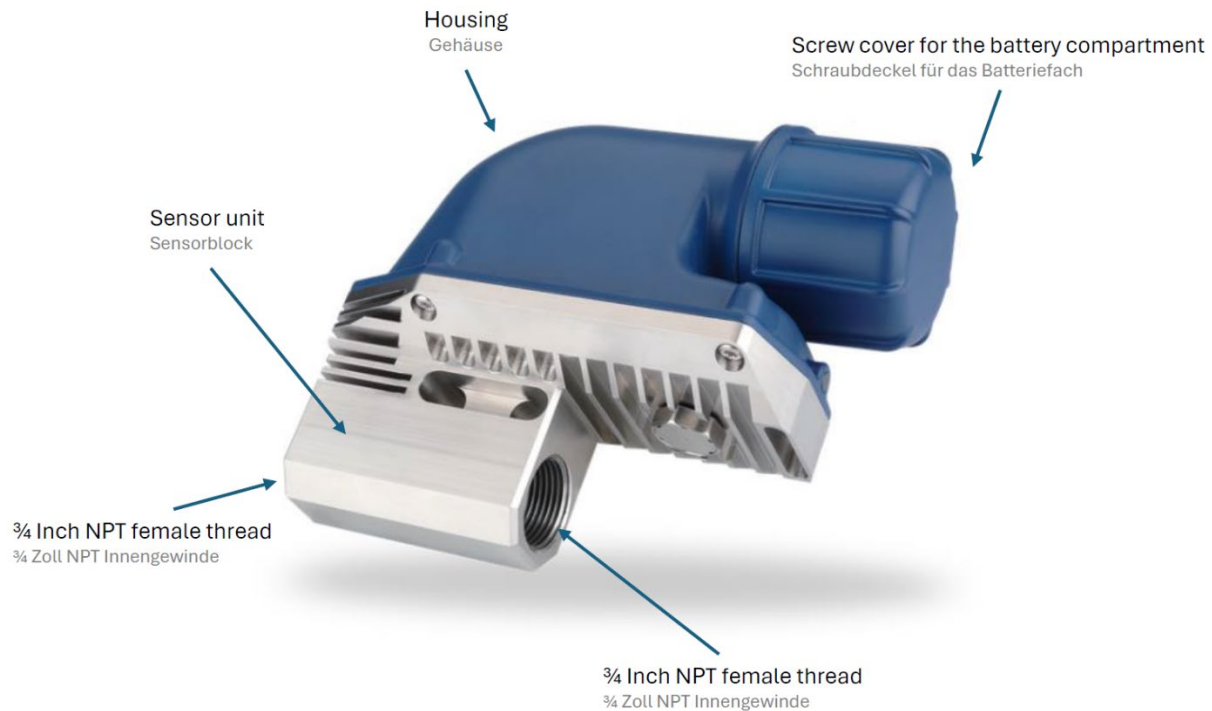


Figure 1: EB Smart Seal sensor

Notes for FCC: Changes or modifications that were not expressly approved by the manufacturer may result in the user losing authorization to operate the device.

This device conforms to part 15 of the FCC regulations. Operation is subject to the two following conditions:

- (1) This device must not cause harmful interference, and
- (2) this device must accept received interference, including interference that could cause undesirable operation.

Notes for IC: This device conforms to the license-free RSS standards of Industry Canada. Operation is subject to the two following conditions: (1) This device must not cause interference, and (2) this device must accept received interference, including interference that could cause undesirable operation of the device.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

4 Technical data

4.1 Operating limits

Description	Values	Note
Medium		
Connection sizes and pipes		See 1.2 Referenced documents
Maximum operating pressure		
Design pressure		
Maximum operating temperature		
Design temperature		
Permissible ambient temperature		
Signal output		Communication range to the edge/gateway up to 70 meters
Battery operation		Up to 3 years
Distance from the seal		Max. 0.5 m
Process temperature / Ambient temperature (T class)		150 °C / 30 °C (T3/T2) 140 °C / 40 °C (T3/T2) 130 °C / 50 °C (T3/T2) 120 °C / 60 °C (T4/T3/T2)

5 Storage

5.1 Check the supplied items

- ✓ Check the packaging for damage.
- ✓ Report any damage to the packaging to the carrier.
- ✓ Check the items for completeness against the delivery note.
- ✓ Photograph damaged items and missing parts to document and report to EagleBurgmann in writing.
- ✓ Check that screw connections are tight.

5.2 Storing the system

- ⇒ Observe the requirements for the storage space:
 - Level surface that is suitable for the weight.
 - Provides sufficient space for maintenance and repair work.
 - Free of vibrations and other impacts.
- ⇒ Keep the space well ventilated and at an even temperature.
- ⇒ Set the temperature to between 15 °C and 35 °C.
- ⇒ Set the relative humidity to less than 65 %.
- ⇒ Protect the system against direct thermal radiation, ultraviolet light and ozone.
- ⇒ Protect the system against dust.
- ⇒ Store all parts of the equipment upright.

- ⇒ Clean and dry the system before putting into storage.
- ⇒ Observe the specifications provided by the manufacturers of non-EagleBurgmann equipment.
- ⇒ If the system is in storage or not in operation: Remove the battery and store separately.

6 Transportation

6.1 Transporting the system

- ⇒ Follow the pictograms and handling instructions on the packaging.
- ⇒ If the system is equipped with measuring devices, avoid vibration and impact.
- ⇒ Lift the system at the points shown in the drawing, taking the dead load into account.

7 Assembly

7.1 Tools and equipment required

Note: The equipment must be suitable for the materials used, the media and the operating conditions.

Cleaning

Application	Accessories
All parts	Alcohol, e.g. ethanol, isopropyl alcohol
	Cloths that clean without leaving residues, such as cellulose or cotton cloths.

Fitting

Application	Accessories
Screws, threaded pins	Set of Allen keys
	Set of open-end or ring wrenches
	Torque wrench
O-rings	O-ring pick tool set

Sealing

Application	Accessories
Threaded pipe fittings	Thread sealer, e.g. LOCTITE® no. 266™ (LOCTITE Corporation)

Securing

Application	Accessories
Screws, threaded pins	Thread locker, e.g. LOCTITE® no. 243™ (LOCTITE Corporation)

7.2 Check before assembly

Lines:

- The pipe sections are laid so as to prevent air pockets.

- Relative movements between the system and seal (linear expansion / vibration) were taken into account when laying the pipes.
- The connecting pipes are as short as possible and create optimum flow conditions.
Recommendation: Use stainless steel pipes with a sufficiently large cross-section.
- The pipe sections have been cleaned thoroughly, e.g. with compressed air.
- The flange sealing surfaces and thread have been checked for damage.

Electronics:

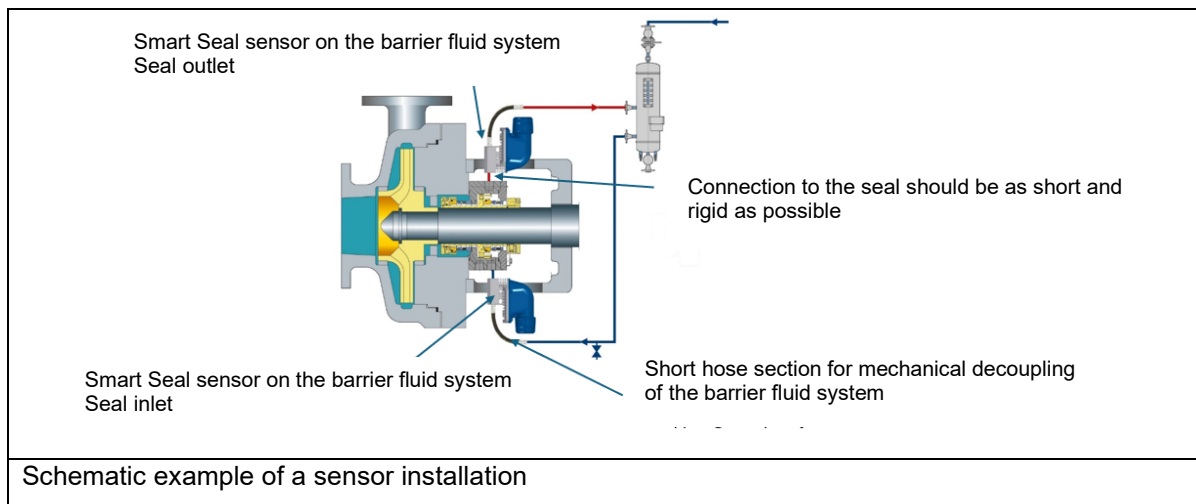
- The functionality of the electrical components has been tested. See section 8.2. *Measures while starting up*.
- The battery has been removed.

Operating location:

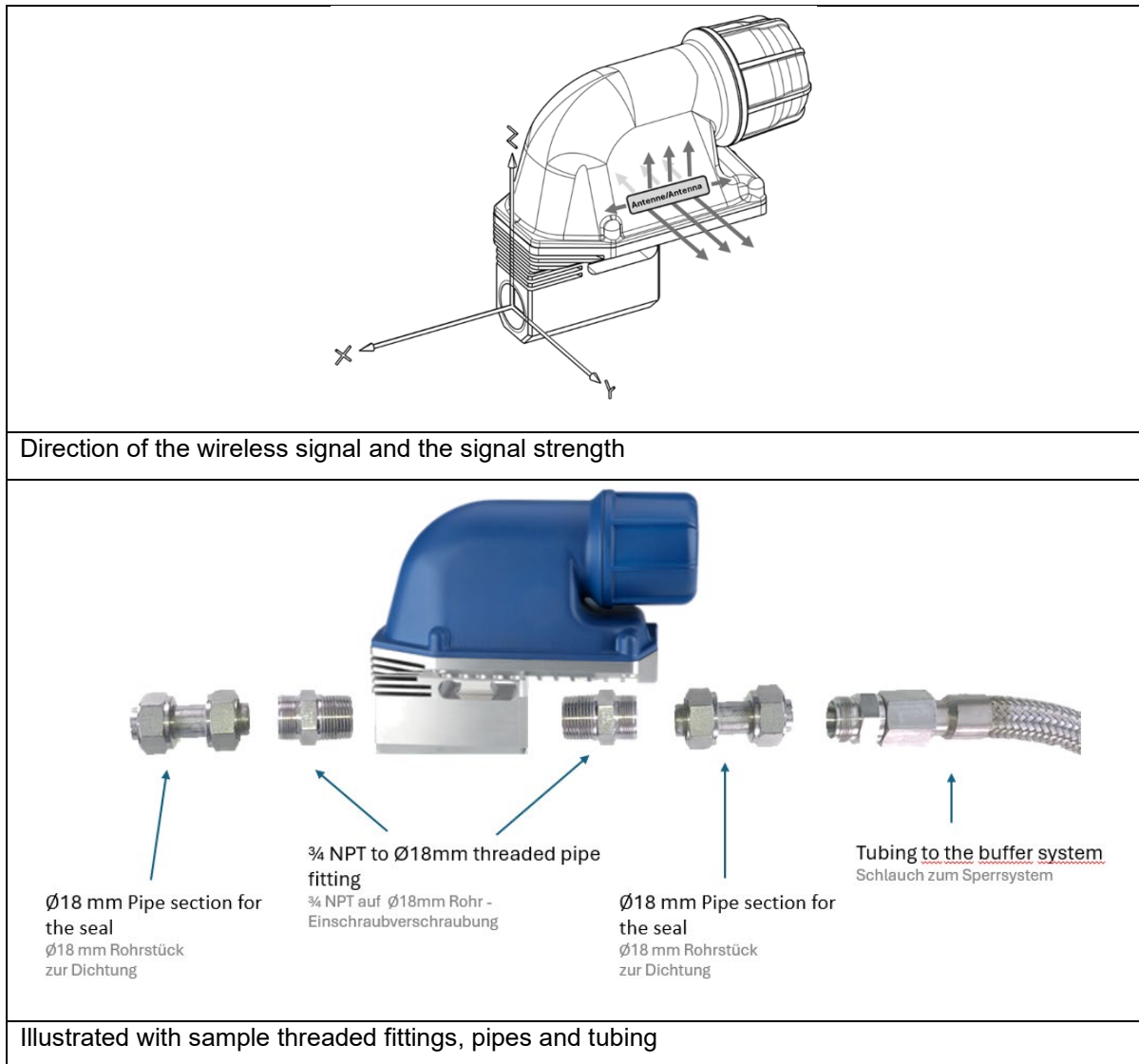
- The installation location is suitable for the weight and dimensions.

Note on the operating conditions:

- The space required to remove filter inserts and other components, for example, has been taken into account.
-
- The installation location is in the immediate vicinity of the seal's barrier fluid inlet (LBI) and barrier fluid outlet (LBO).



- The direction of the wireless signal and its strength between the system and the gateway has been taken into account and measured. If necessary, contact EagleBurgmann for the measurement.

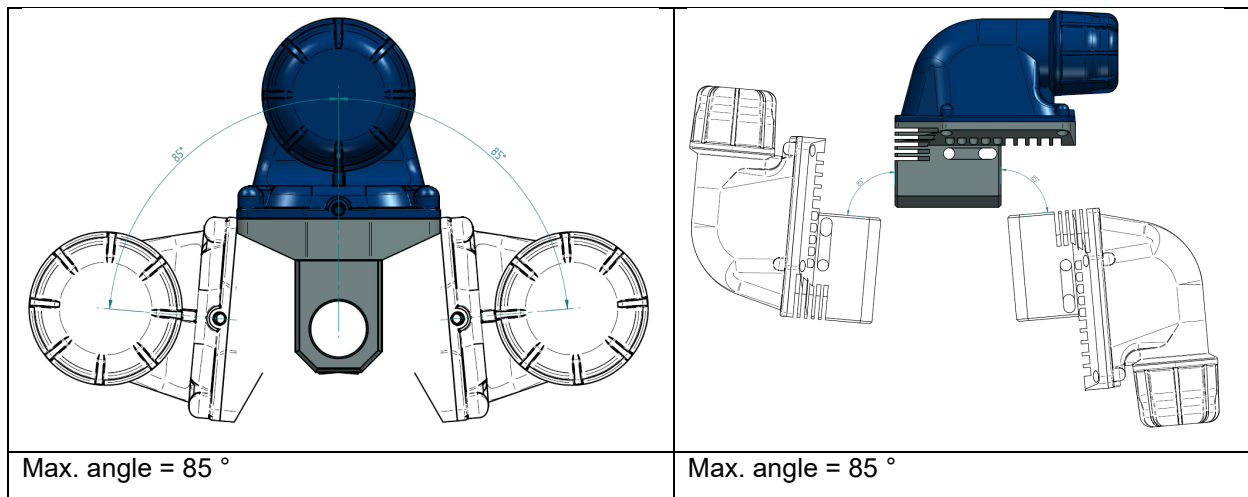


Protective measures:

- Effects of the environment on the system have been checked and suitable protective measures have been taken:
 - Temperatures: Protection against accidental contact and insulation
 - Sunlight: Protective roof
 - Contamination of the system by sand and salt, for example: Protective housing, painting
- The grounding, equipotential bonding and grid connection conditions of the system and of any further pipes have been checked.
- If critical potential differences are identified, suitable measures are taken.

7.3 Fitting the system

- ⇒ Follow the drawing.
- ⇒ Do not use force.
- ⇒ Fit the system at the specified attachment points, taking the expected loads into account.
- ⇒ Refer to the drawing and P&ID diagram for the connection sizes.
- ⇒ If necessary: Create the equipotential bonding.
- ⇒ If necessary: Install the electrical system.
- ⇒ If necessary: Install drain connections at the lowest points of the pipe system.
- ⇒ If necessary: Install venting connections at the highest points of the pipe system.
- ⇒ The connection from the system to the seal must be rigid, e.g. pipe
- ⇒ The connection from the system to the supply system must be flexible, e.g. tubing
- ⇒ **CAUTION!** Fit the system as follows:



8 Starting up and shutting down

8.1 Check before starting up

- There are no visual signs of damage to the system.
- The system has been fitted at the specified attachment points, taking the expected loads into account.
- All pipe runs rise steadily.
- The pipes have been fixed at regular intervals (maximum 2 m).
- The pipe system has been checked for leaks.
- The installation position has been checked.
- The equipotential bonding has been created.
- If necessary: The electrical system has been installed.
- If necessary: The drain connections have been installed at the lowest points of the pipe system.

- If necessary: The venting connections have been installed at the highest points of the pipe system.
- If necessary: The wireless connection has been established.
 - If necessary: The switching positions of the valves have been checked.

8.2 Starting up the system

⇒ Run the self test.

- To run the self test, insert the EB Smart Seal© sensor battery.
- ✓ Unpack the EB Smart Seal© sensor battery and remove the protective tape.
- ✓ Remove the cover from the system and remove the old battery if necessary.
- ✓ Insert the new EB Smart Seal© sensor battery into the system. Note the installation position.
- ✓ Attach and screw down the system cover.

The self test is successful if the green LED lights up within 2 seconds.

► The system is now ready for use.

8.3 Shutting down the system



Danger of suffocation by nitrogen!

If used in enclosed spaces, there is a danger from increased nitrogen concentrations that leads to loss of consciousness and suffocation, resulting in death.

- ⇒ Ensure the spaces are well ventilated.
- ⇒ Regularly check the nitrogen concentration.
- ⇒ Wear personal protective equipment.

If the system will be out of operation for more than 2 months:

- ✓ Shut the system down in accordance with the manufacturer's instructions.
- ✓ Switch off the installation.
- ✓ Switch off the system.
- ✓ Allow the system to cool down to room temperature.
- ✓ If pressurized: Use the relief valves or breather valves to depressurize the system.



Danger from the media used!

There is a danger to people and the environment when using hazardous media.

- ⇒ Collect the media and dispose of correctly.

- ✓ Drain the medium:
 1. If there is a drainage connection, collect the medium and dispose of correctly.
 2. Slowly open the drain valve.
 3. Slowly open the breather valve until the system is empty.

- ✓ Dry the system.
- ✓ Close the valves.
- ✓ Remove the EB Smart Seal© sensor battery and store in accordance with the manufacturer's instructions.

9 Operation

9.1 Monitor operation

- ⇒ Document all work.
- ⇒ Check the operating parameters and correct if necessary.
- ⇒ Check the functions of the monitoring devices.

10 Maintenance and repair

10.1 Check before maintenance

Before maintenance, make sure that:

- The system is switched off.
- The system has cooled down to room temperature.
- If necessary: The system has been depressurized and drained. *See section 8.3. Measures while shutting down.*
- If necessary: Alarm signals in the maintenance area have been switched off.
- If work is needed on the terminal box, shut down the system and wait 20 minutes before opening the terminal box.

10.2 Clean the system



Danger of explosion!

Danger of death due to ignition of the explosive atmosphere.

- ⇒ Only a damp cloth to wipe and clean non-metallic surfaces, e.g. inspection windows or plastic housings.
- ⇒ Use anti-static cleaning cloths.

- ⇒ If necessary: Clean the system. The cleaning intervals depend on the degree of contamination.
- ⇒ Recommendation: After maintenance and cleaning, flush the system to clean the pipes.

10.3 Maintenance

- ⇒ Replace wearing parts, e.g. battery or filter elements, as described in the specification and as required.
- ⇒ If necessary: Correct defects, e.g. leaks and loosened pipe fixings.
- ⇒ Recommendation: Inspect the system every six months.

Carry out the inspection:

- ⇒ Check the system for leaks at pipe connections and welded joints and tighten or replace if necessary.
- ⇒ Check the fixing elements and tighten or replace if necessary.
 - ✓ Visually inspect for external damage and corrosion condition. Repair or replace if necessary.

(2024.07.15)

 DANGER

Danger of explosion

Danger of death due to ignition of the explosive atmosphere.

- ⇒ Only a damp cloth to wipe and clean non-metallic surfaces, e.g. inspection windows or plastic housings.
- ⇒ Use anti-static cleaning cloths.
- ⇒ Prevent ingress of moisture and dust.

Before changing the battery, make sure that:

- The system is switched off.
 - The system has cooled down to room temperature.
 - The housing has been thoroughly cleaned.
- ⇒ Remove the screw-on cover for the battery compartment.
 - ⇒ Remove the battery.
 - ⇒ Insert the new battery. Do not use force.

The battery may be changed in the Ex zone.
 - ⇒ Attach the screw-on cover for the battery compartment.

10.4 Repair

- ⇒ Only replaced complete system components.

Contact EagleBurgmann if the owner is unable to ensure a correct repair.

11 Troubleshooting

11.1 Action in the event of a fault

For the table of faults, see Annex A. Fault table.

- ✓ Identify the type of fault.
- ✓ Document the faults.
- ✓ Switch the system off if necessary. *See section 8.3. Shutting down the system.*
- ✓ Rectify the fault.
- ✓ Check the measures carried out and carry out additional measures, if necessary.
- ✓ Start up the system and check whether the fault has been rectified.
- ✓ If the fault cannot be rectified or the cause of the fault cannot be clearly identified:
Contact EagleBurgmann.

12 Disassembly

12.1 Dismantle the system

- ✓ Shut the plant or machine down. *See section 8.3 Shutting down the system.*
- ✓ Isolate from the electricity supply (e.g. battery or system wiring).
- ✓ Flush the system using a suitable medium.
- ✓ Clean and dry the system.
- ✓ Detach the connecting cables.
- ✓ Close all openings.
- ✓ Detach the system from the plant.

13 Spare parts

13.1 Order spare parts

- ⇒ Only use genuine EagleBurgmann spare parts.
- ⇒ Provide the following information with your order:
 - Delivery address
 - Invoice address (if different from the delivery address)
 - Order number
 - Drawing no.
 - Item number and TAG number
 - Quantity required
- ⇒ Send the order to EagleBurgmann. *Contact data see page 2.*

14 Disposal

14.1 Dispose of the system

Caution

Danger to health from contaminated system!

If the system was operated with hazardous substances, contact with media residues can be harmful to the health.

⇒ Wear personal protective equipment such as gloves and goggles.

⇒ Dismantle and dispose of the system in accordance with national regulations.

14.2 Disposal of electrical and electronic waste

Electrical or electronic devices that are identified with this symbol must not be disposed of with the domestic waste at the end of their service life.

⇒ Contact your local disposal facility for more information.

If the old electrical or electronic device contains personal data, the owner is responsible for deleting it before returning the devices.

Due to some of the components it contains, the device is regarded as hazardous waste and meets the requirements of RoHS 2011/65/EU.

⇒ After use, dispose of the device correctly and with due regard to the local regulations.



15 Appendix A: Fault table

Component/ TAG number	Event	Description	Measures
EB Smart Seal sensor	Flashing light lights up red	No values found in the EB portal (communication problem)	✓ Check the connection. ✓ Check the battery and replace if necessary. ✓ Contact EB Service.
	Flashing light lights up green		✓ Check the connection. ✓ Contact EB Service.
	Flashing light lights up green		⇒ Check the battery and replace if necessary.