

CR, CRN 95-155

Double shaft seal (back-to-back)

Installation and operating instructions



Original installation and operating instructions

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**Warning**

Prior to installation, read these installation and operating instructions. Installation and operation must comply with local regulations and accepted codes of good practice.

1. Symbols used in this document

**Warning**

If these safety instructions are not observed, it may result in personal injury.

Caution

If these safety instructions are not observed, it may result in malfunction or damage to the equipment.

Note

Notes or instructions that make the job easier and ensure safe operation.

2. General information

These installation and operating instructions are a supplement to installation and operating instructions for standard CR, CRN pumps, publication No 99078486.

3. Product description

This type of double seal consists of two shaft seals mounted in a "back-to-back" arrangement in a separate seal chamber.

The pressure in the seal chamber is higher than the pump pressure.

The double seal arrangement with pressurised seal chamber prevents the pumped liquid from leaking to the environment via the shaft seal.

The pressure in the seal chamber can be generated in three ways:

- by means of a dosing pump (section 8.1)
- by means of an already existing system.

4. Applications

The shaft seal is available for the following Grundfos pumps:

Pump type	CR 95	CR 125	CR 155
CR	•	•	•
CRN	•	•	•

This type of shaft seal is the optimum solution when handling abrasive or sticky liquids which would either wear out, damage or block a mechanical shaft seal.

Recommended for applications involving toxic, aggressive or flammable liquids, the seal shaft protects the surrounding environment and the people working in the vicinity of the pump.

If the shaft seal is used in applications where special safety precautions must be observed due to hazardous liquids, the customer bears full responsibility!

5. Maximum liquid pressure and temperature

Due to the shaft seal design, the pressure in the seal chamber must not exceed 30 bar. The pressure of the barrier fluid must always be higher than the pressure of the pumped liquid.

The maximum temperature of the barrier fluid depends on the rubber material of the shaft seal.

Shaft seal	Maximum temperature [°C]
EPDM	+120
FKM	+90
FFKM	+120
FXM	+120

6. Barrier fluid connections

Key to the letters in the drawings:

Pos. A = pumped liquid.

Pos. C/D and E = barrier fluid.

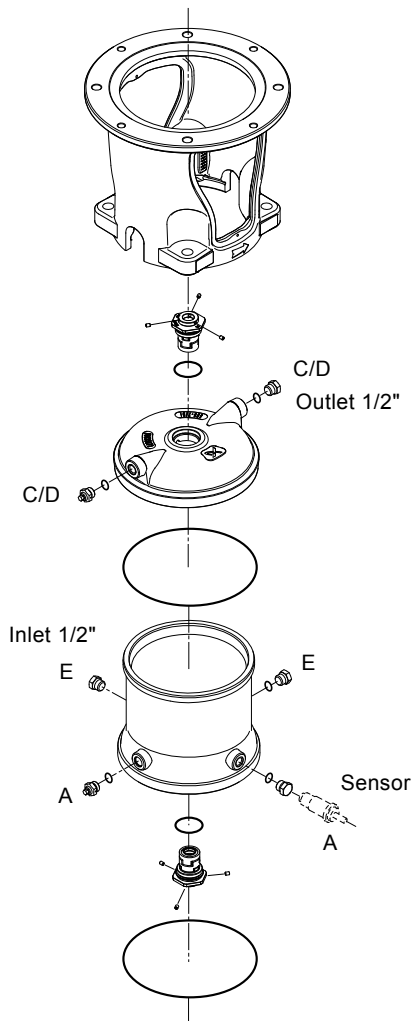


Fig. 1 Seal chamber CR, CRN 95, 125, 155

TM07 3366 49 18

7. Pump with dosing pump

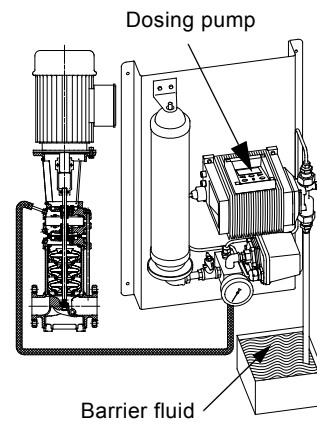


Fig. 2 Pump with dosing pump

TM01 9099 1701

7.1 Dimensions of pump with dosing pump

Pump type	Additional height of seal chamber [mm]
CR, CRN 95	209
CR, CRN 125, 155	244

8. Startup

8.1 Pump with dosing pump

Warning

Pay attention to the orientation of the vent holes, and take care to ensure that the escaping liquid does not cause personal injury or damage to the motor or other components.

When handling hot or hazardous liquids, special attention should be paid to the risk of personal injury.

When pumping flammable liquids, beware of static discharges. The funnel, for instance, should be earthed!



Illustration	Step	Action
	1	<p>Connecting the barrier fluid supply pipe</p> <ul style="list-style-type: none"> Connect one end to the seal chamber (pos. E, fig. 1). Connect the other end to the outlet of the dosing pump.
	2	<p>Recommended pressure</p> <ul style="list-style-type: none"> Set the start pressure of the dosing pump to a pressure 1.5 to 2 bar above the highest pressure the pump can deliver. ($P_{\text{pump}} + P_{\text{inlet}} + P_{1.5 - 2.0} < P_{\text{dosing max.}}$)
	3	<p>Filling and venting the seal chamber</p> <ul style="list-style-type: none"> Start the dosing pump. Fill and vent the seal chamber by means of the vent screw at the top of the seal chamber (pos. C/D, fig. 1). The dosing pump will stop automatically when the pressure set in step 2 has been reached.
	4	<p>Operation with positive inlet pressure</p> <ul style="list-style-type: none"> Open the vent screw (pos. A, fig. 1) on the side of the pump head. Close the isolating valve on the discharge side. Open the isolating valve on the inlet side. Slowly fill the pump with the liquid to be pumped. When the liquid starts running out of the vent hole, immediately close the vent screw.
	4	<p>Operation with suction lift</p> <ul style="list-style-type: none"> Open the vent screw (pos. A, fig. 1) on the side of the pump head. Close the isolating valve on the discharge side. Fill the pump and the inlet pipe with the liquid to be pumped using a funnel. When the liquid starts running out of the vent hole, immediately close the vent screw. <p>Note: A non-return valve must be fitted to the inlet pipe.</p>
	5	<p>Starting up the pump</p> <ul style="list-style-type: none"> See also the installation and operating instructions for standard CR, CRN pumps. Open the isolating valve on the discharge side. Start the pump, and check the direction of rotation. See the correct direction of rotation on the motor fan cover. After a few minutes, vent the pump again by means of the vent screw (pos. A, fig. 1).

9. Maintenance

See the installation and operating instructions for standard CR, CRN pumps.

Dosing pump

See the installation and operating instructions for the dosing pump.

10. Operation

To ensure optimum function and performance, check the pressure regularly.

Dosing pump

The pressure of the barrier fluid must always be 1.5 to 2 bar higher than the pressure of the pumped liquid. This is automatically checked by the pressure switch/ transmitter fitted together with the dosing pump.

Note

A very small quantity of the barrier fluid, i.e. less than 10 ml/24 operating hours, will always flow into the pumped liquid.

10.1 Frost protection

For general guidelines on frost protection of the pump, see the installation and operating instructions for standard CR, CRN pumps.

Seal chamber

Drain the seal chamber by slackening the lower plug (pos. E, fig. 1).

Dosing pump

For frost protection, see the installation and operating instructions for the dosing pump.

**Warning**

If the pumped liquid is hazardous to health, take special care when draining the pump. Local safety regulations must be observed.

11. Disposal

This product or parts of it must be disposed of in an environmentally sound way:

1. Use the public or private waste collection service.
2. If this is not possible, contact the nearest Grundfos company or service workshop.

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