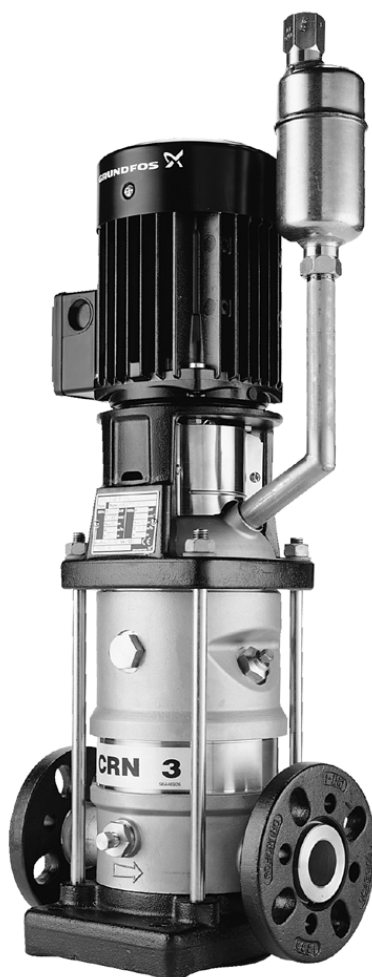


# CR, CRI, CRN 1s, 1, 3, 5, 10, 15, 20 CR, CRN 32, 45, 64, 90, 120, 150

High temperature  
(air-cooled top)

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.



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



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, CRI, CRN pumps, publication No 96462123, and for CRN-SF pumps, publication No 96530119.

**3. Product description**

The Grundfos air-cooled top separates the seal chamber from the chamber stack by an air-cooled chamber.

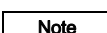
Before reaching the shaft seal, the hot liquid is cooled to a temperature of +120 °C or lower (at a maximum liquid temperature of +180 °C) when flowing through the air-cooled chamber.

**4. Applications**

The air-cooled top is available for the following Grundfos pumps:

Pump type	CR 1s	CR 1	CR 3	CR 5	CR 10	CR 15	CR 20	CR 32	CR 45	CR 64	CR 90	CR 120	CR 150
CR								•	•	•	•	•	•
CRI	•	•	•	•	•	•	•						
CRN	•	•	•	•	•	•	•	•	•	•	•	•	•

• Available.



CRT, CRTE pumps are not available with air-cooled top.

**5. Temperature range**

The air-cooled top is available for three different temperature ranges:

Liquid temperature [°C]	Material of rubber parts	PN	CR
<b>Water-based liquids</b>			
120-150	EPDM	25	1-150
120-180	FXM/EPDM	25	1-150
<b>Thermal oils</b>			
120-240	FKM	16	1-90
120-180	FKM	16	120-150

**6. Air vent positions**

**6.1 Vertical pumps**

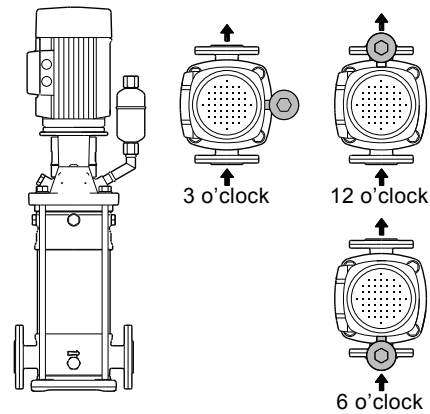


Fig. 1 Air vent positions on vertical CR pumps

**6.1.1 Dimensions**

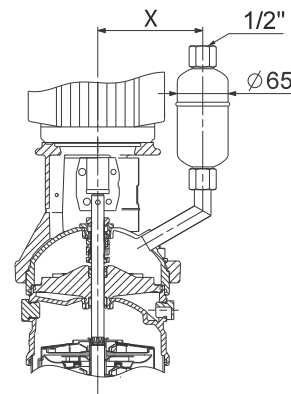


Fig. 2 Dimensional sketch

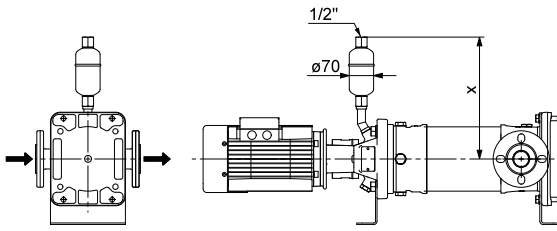
**Key to fig. 2**

Pump type	x [mm]
CRI, CRN 1s, 1, 3, 5	142
CRI, CRN 1s, 1, 3, 5 (3 - 7.5 kW)	172
CRI, CRN 10, 15, 20 (< 4 kW)	156
CRI, CRN 10, 15, 20 (4 - 7.5 kW)	186
CRI, CRN 10, 15, 20 (11 - 18.5 kW)	217
CR, CRN 32	176
CR, CRN 45, 64	186
CR, CRN 90	190
CR, CRN 120, 150 (11 - 45 kW)	190
CR, CRN 120, 150 (55 - 75 kW)	243

TM03 3659 0606

TM03 4082 2409

## 6.2 Horizontal pumps



TM03 4084 1606

Fig. 3 Air vent position on horizontal CR pumps

### Key to fig. 3

Pump type	x [mm]
CRI, CRN(E) 1s, 3, 5	308
CRI, CRN 10, 15, 20	324
CR, CRN 32	391
CR, CRN 45, 64	398
CR, CRN 90, 120, 150	404

**Note** 75 kW motors are higher than distance x.

## 7. Seal chamber connections

The seal chamber has connections for the air vent and sensors. Figures 4, 5 and 6 show the connections for the air vent. Pos. A shows the connection for a sensor.

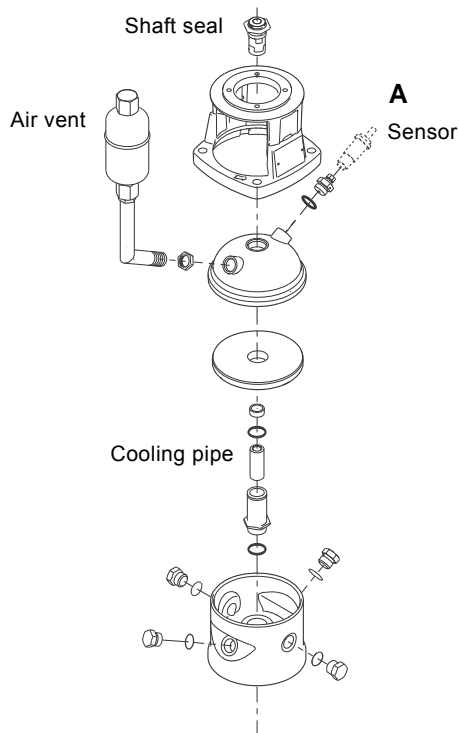


Fig. 4 Seal chamber CRI, CRN 1s, 1, 3, 5

TM03 8270 0907

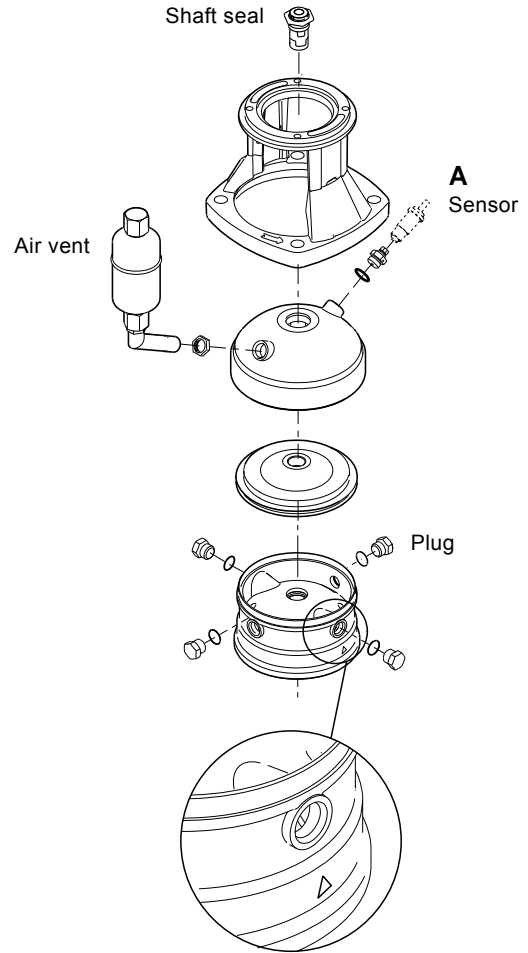


Fig. 5 Seal chamber CRI, CRN 10, 15, 20

TM04 4186 0909

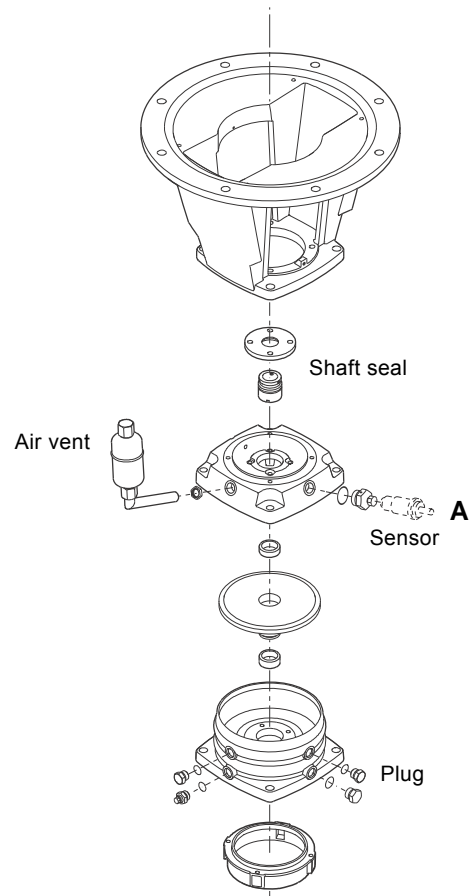


Fig. 6 Seal chamber CR, CRN 32, 45, 64, 90, 120, 150

TM04 4082 0909

8. Sectional drawings

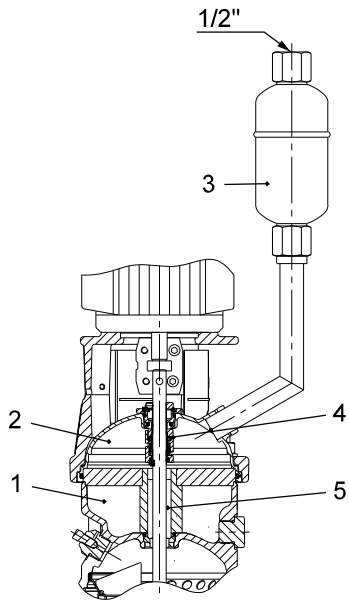


Fig. 7 CRN 1s, 1, 3, 5

TM03 9159 3507

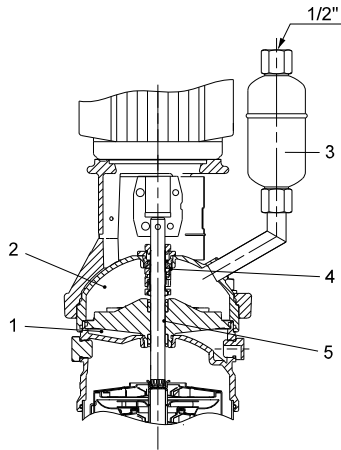


Fig. 8 CRN 10, 15, 20

TM03 9160 3507

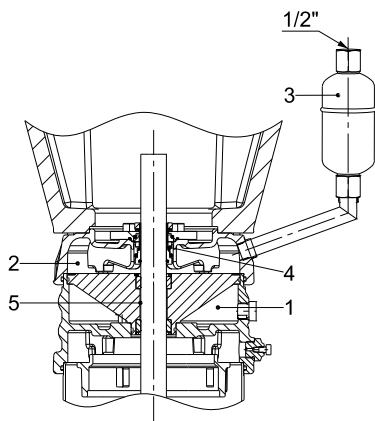


Fig. 9 CRN 32, 45, 64, 90, 120, 150

TM04 4165 0909

Key to figures 7, 8 and 9

Pos.	Designation
1	Air chamber
2	Liquid
3	Air vent
4	Shaft seal
5	Cooling pipe

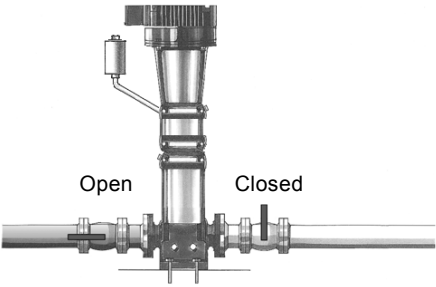
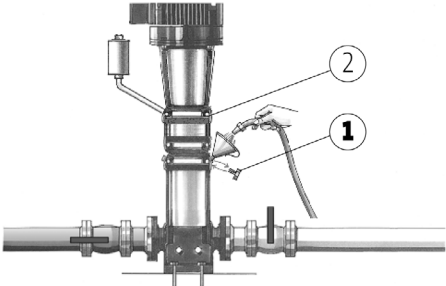
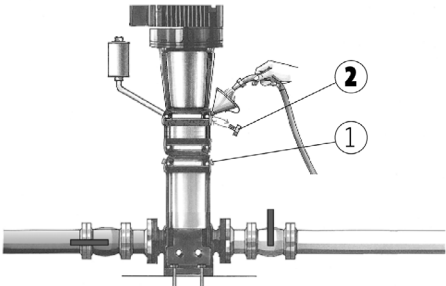
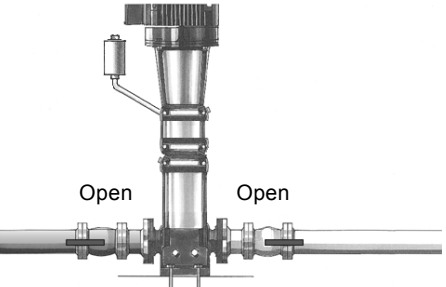
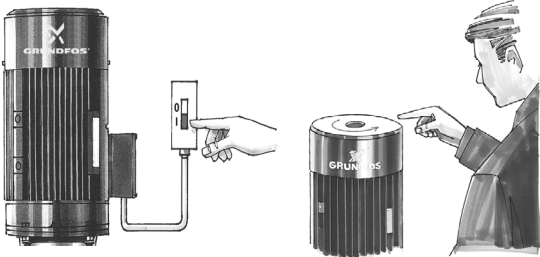
## 9. Startup

**Note** Do not start the pump until it has been filled with liquid and vented.



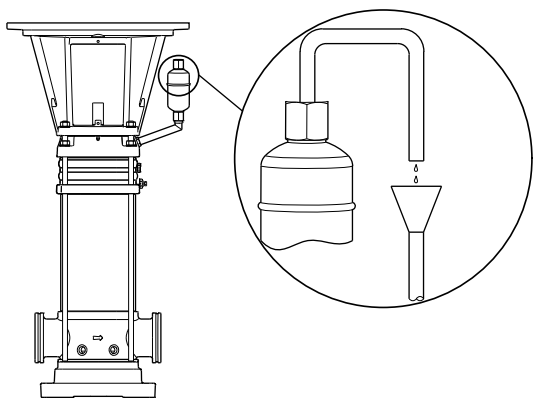
**Warning**

Pay attention to the direction of the vent hole, and take care to ensure that the escaping liquid does not cause injury to persons or damage to the motor or other components.  
 In hot-liquid installations, pay special attention to the risk of personal injury caused by scalding hot liquid. It is advisable to connect a drain pipe to the air vent (1/2") in order to lead the hot water/steam to a safe place.

Step	Action
<p>1</p> 	<p>Close the isolating valve on the discharge side, and open the isolating valve on the inlet side.</p> <p><b>Note:</b> At startup, the temperature of the pumped liquid should be lower than the ambient temperature.</p> <p>TM02 4151 5001</p>
<p>2</p> 	<p>Remove the priming plug from the pump head (1), and slowly fill the pump with liquid. When the pump is completely filled with liquid, replace the priming plug and tighten securely.</p> <p>TM02 4152 1503</p>
<p>3</p> 	<p>Remove the priming plug from the air-cooled chamber (2), and slowly fill the chamber with liquid. When the chamber is completely filled with liquid, replace the priming plug and tighten securely.</p> <p>TM02 4153 1503</p>
<p>4</p> 	<p>Open the isolating valve on the discharge side.</p> <p>TM02 5907 4002</p>
<p>5</p> 	<p>Start the pump, and check the direction of rotation. See the correct direction of rotation on the motor fan cover. If the direction of rotation is wrong, interchange any two of the incoming supply wires. After 3 to 5 minutes, the air vent has been filled with liquid.</p> <p><b>Note:</b> The sleeve may leak a little at startup if the temperature of pumped liquid is much higher than that of the liquid in the air-cooled top.</p> <p>TM01 1406 3702 - TM01 1405 4497</p>

## 10. Operation

Because of the way automatic air vents operate, they will leak water when discharging air. This is perfectly normal. Therefore, we recommend that you lead the water to a drain, for instance via a goose neck.



TM04 4083 0709

**Fig. 10** Example of how to remove condensed water from the air-cooled top

## 11. Frost protection

See the installation and operating instructions for the standard pump.

**Note**

*The air-cooled top must also be vented and drained.*

## 12. Dimensions

Pump type	Additional height [mm]
CRI, CRN 1s, 1, 3, 5	108
CRI, CRN 10, 15, 20	90
CR, CRN 32	185
CR, CRN 45	215
CR, CRN 64	141
CR, CRN 90	159
CRN 120, 150	111

## 13. 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.

Subject to alterations.

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ECM: 1127678
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