

Industrial X-Ray

Cooler Manual XRC-3001-WW 3000 Watt water to water cooler



Document history

Version	Date	Author	Amendment(s)	Status
	12/15/2008	St. Haferl		released
1.0	07/22/2010	M. Schmid	Layout / Structure	
	07/22/2010	St. Haferl		released
2.0	10/30/2012	R. Moser	Storage temperature	
3.0	07/01/2013	R. Moser	Update Chapter 3	
4.0	24/11/2014	R. Vonlanthen	Update in Chapter 2., Specs change (pressure primary, Block diagram	
5.0	01.12.2015	M. Schmid	New electrical drawing	

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1 Before you start

- Read the manual before setting into operation!
- Coolant: Water or water-glycol mixture (max. 1:1 water - glycol)
- Power supply 230 V 50/60 Hz!
- Run cooling unit always with correct coolant level otherwise cooling capacity is reduced!
- Clean filter regularly according to maintenance instructions, otherwise damage of pump may occur!
- Never operate cooling unit when ball cock is closed, otherwise damage of pump may occur!
- Only use cooling hoses with sufficient pressure resistance and with resistance to used coolant!
- Before opening the cooling unit disconnect always from the mains.
- Before starting any service work disconnect the cooling unit from the mains.



2 Product Description

The cooling unit XRC-3001-WW is intended to cool the water circuit of an x-ray tube. The coolant can be water or a mixture of water and antifreeze (water/glycol). Water circulates between the cooling unit and the x-ray tube (heat source) called the secondary circuit. The water is re-cooled by a water-cooled heat exchanger, called the primary circuit.

The cooling capacity of the unit depends on the temperature difference between the outlet temperature of the secondary cooling circuit and the temperature and pressure of the used water supply (primary circuit).

Cooling hoses are connected to the cooling unit via hose nipples. Water inlet and outlet are marked with the following symbols.

↓ ↑
Inlet: ○ Outlet: ○

An electronic temperature controller controls the secondary water outlet temperature by activating a magnetic valve in the primary circuit when the set temperature is reached. This controller is provided with an additional potential free circuit switch, which opens at maximum temperature.

The water flow in the secondary cooling circuit is monitored and the indication contact is connected to a safety circuit in series with the above mentioned temperature contact.

A bypass valve limits the maximum pressure of the pump.



The temperature controller and the bypass valve are set according to specifications.

3 Technical data

3.1 Physical dimensions

Length:	450 mm
Width:	270 mm
Height:	400 mm
Weight:	ca. 24 kg
Coolant capacity:	ca. 8,5 l

3.2 Performance data

Cooling capacity:	3000 W ($\Delta T \leq 22 \text{ }^\circ\text{K}$)
Flow rate:	$\geq 5.4 \text{ l / min}$ at 4 bar
Mains voltage:	230 V + 10% - 15% 48 - 62 Hz
Current consumption:	$\leq 1.8 \text{ A}$
Noise level:	$\leq 47 \text{ dB(A)}$ at 50 Hz, distance 1m in any direction $\leq 51 \text{ dB(A)}$ at 60 Hz, distance 1m in any direction
Safety class:	IP 33

3.3 Environmental specifications

Operational temperature:	0°C...+ 40°C (use antifreeze if ambient temperature is below 10°C)
Storage temperature:	-25°C...+ 70°C (store with antifreeze)
Air humidity:	20%...90% non condensing

3.4 Settings*

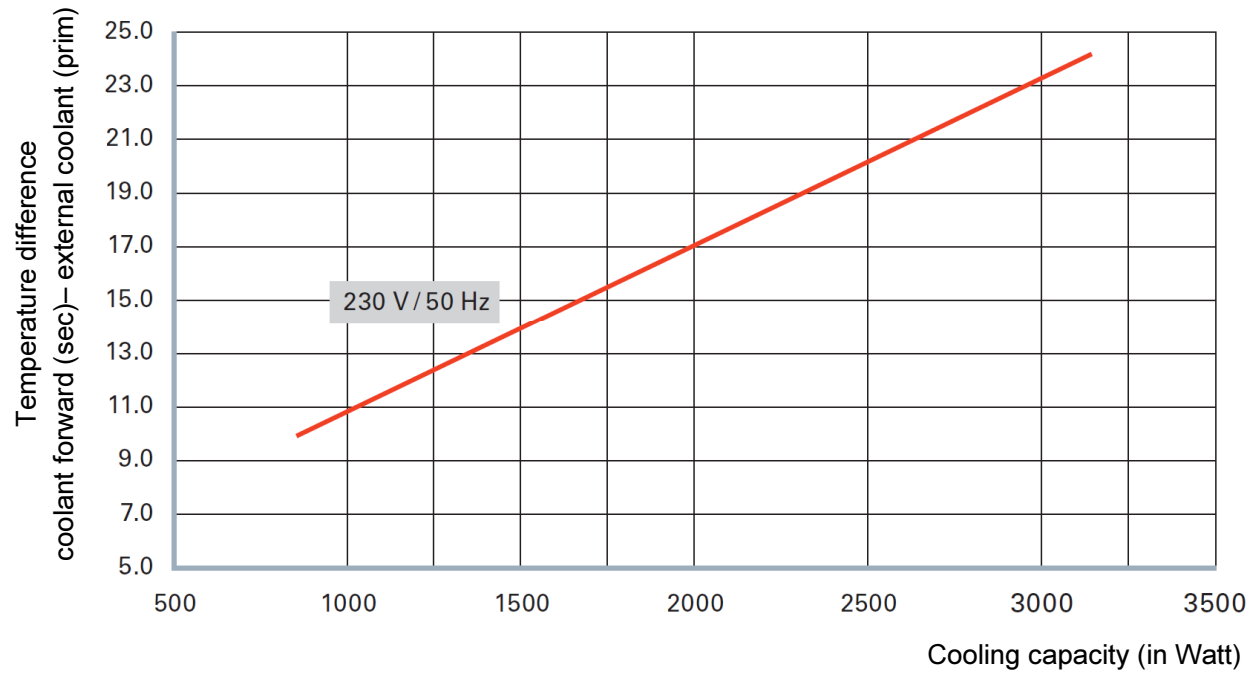
Maximum forward pressure:	6,7 bar
Flow switch open:	< 4,0 l/min
Thermal switch open:	> 25°C
Thermal switch close:	< 45°C

3.5 Primary circuit specifications

Maximum pressure:	6,5 bar (10 bar up to 20°C)
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* These setting values are optimized for our XRS modules.

3.6 Performance data



3.7 Overview



4 Installation

- The cooling unit must be positioned horizontally and the ventilation holes must be kept free.
- Remove sealing caps from hose nipples.
- Connect the cooling unit with hoses
- Open filler cap and fill tank with water (8.5 l),
- Filling height 2 cm below inlet
- The Cooling water for the tube cooling is added with antifreeze. We recommend Ethylenglycol with tap water in a mix according to the table under point 4.1.
- Establish electrical connection according to
- the wiring diagram
- Connect to power and run unit approx. 10minutes to remove air from system.
- Check water level. If necessary refill water.
- Replace metal transportation filler cap with red stationary filler cap.



4.1 Antifreeze concentration

It is essential that the correct antifreeze mix is added. The recommended antifreeze product is Ethylenglycol. See the table below for your guidance. Consult your antifreeze supplier for Ethylenglycol.

Concentration by volume (%)	Approximate freezing point (°C)
20	-9
25	-12
30	-15
50	-25

5 Settings

5.1 Regulation characteristics

The temperature control unit and a solenoid valve manage the control of the water outlet temperature. The valve is to be opened or closed. If the temperature of the supply water is much lower than the nominal value or if there is a high pressure from the water supply side there is a quick and very peak regulation characteristic.

To configure the regulation characteristic much smoother, there is a ball cock in the cooling circuit to reduce the pressure. If the ball cock is partially closed the regulation becomes smoother.



5.2 Temperature control

The electronic temperature controller controls the magnet valve in the cooling circuit and the contact for maximum water outlet temperature. The controller has 11 parameters, which are set according to the specifications of the cooling unit XRC-3001-WW.



Note: To ensure the functioning of the cooling unit, only parameter P0, P1 and P3 are to be changed by the customer!

5.2.1 Temperature of water outlet (Nominal value, parameter)



P0)

- Push SET key longer than 1 sec., Display: P0
- Push SET key short Display: Value for

P0

- Set desired value with $\Delta\nabla$ keys
- Store value with a short press on SET key.

The controller closes the program modus, if no key is pressed for longer than 5 seconds.

5.2.2 Hysteresis of nominal value (Parameter P1)

- Push SET key longer than 1 sec., Display: P0
- Push Δ key Display: P1
- Push SET key short Display: Value for P1
- Set desired value with $\Delta\nabla$ keys
- Store value with a short press on SET key.

The controller closes the program modus, if no key is pressed for longer than 5 seconds

5.2.3 Alarm value (Parameter P3)

- Push SET key longer than 1 second, Display: P0
- Push Δ key twice Display: P3
- Push SET key short Display: Value for P3
- Set desired value with $\Delta\nabla$ keys
- Store value with a short press on SET key.
- The controller closes the program modus, if no key is pressed for longer than 5 seconds

6 Maintenance

Check the water level on a regular basis, refill water if necessary

6.1 Pump

Check the water pump filter to ensure a clean condition roughly every 3 months, if necessary more often.



Note: If the filter is not in clean condition damage of pump and motor may occur

- Disconnect the cooling unit from mains
- Remove cover
- Unscrew pump filter and check the filter for impurity (24mm nut)



Notice: Some water will run out of the pump. Collect the water with suitable vessel

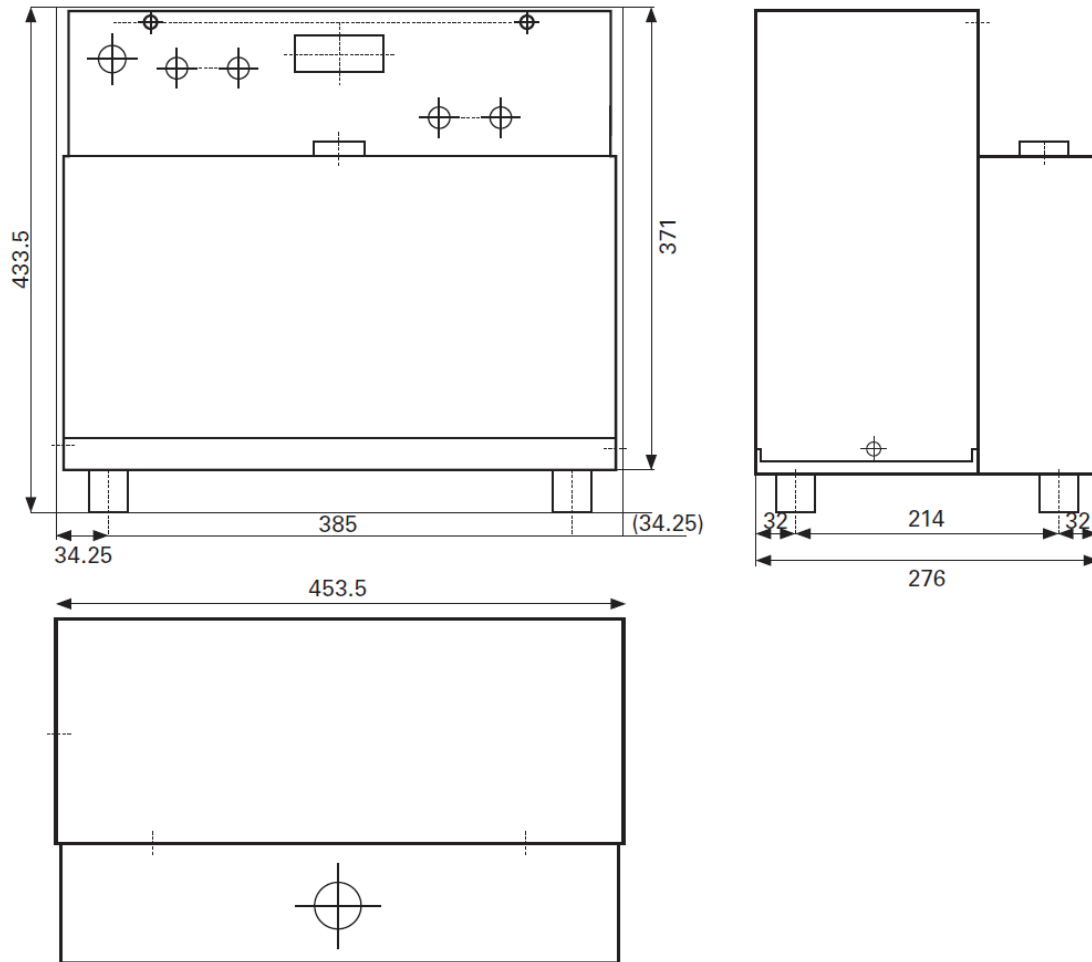
- If necessary clean or replace filter
- Attach filter to the pump
- Check water level and refill if necessary.
- Mount cover
- Set to work



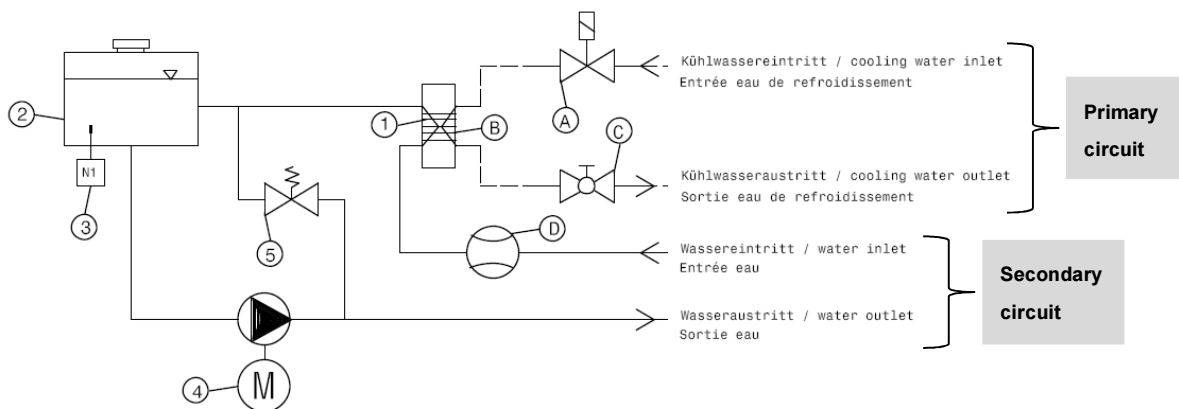
7 Disconnecting

- Empty tank
- Disconnect from power supply
- Disconnect hoses

8 Outline Drawing



9.2 Block diagram



Wasserkreislauf / water circulation / Circuit d'eau

- 1=B Plattenwärmetauscher / evaporator / Echangeur de chaleur à plaques
- 2 Tank / réservoir / Réservoir
- 3 Temperaturregler / temperature controller / Régulateur de température
- 4 Pumpe mit Motor / pump with motor / Pompe avec moteur
- 5 Überströmventil / bypass valve / Soupape de trop-plein

Kühlwasserkreislauf / cooling water cycle / Circuit de refroidissement

- A Magnetventil / solenoid valve / Electrovalve
- B=1 Plattenwärmetauscher / evaporator / Echangeur de chaleur à plaques
- C Kugelhahn / ball cock / Robinet à bille
- D Strömungswächter / flow switch / Dispositif de surveillance écoulement

10 Declaration of conformity

EINBAUERKLÄRUNG FÜR UNVOLLSTÄNDIGE MASCHINE
DECLARATION OF INCORPORATION OF PARTLY COMPLETED MACHINERY
DÉCLARATION D'INCORPORATION DE QUASI-MACHINE



Hersteller / Adresse: Manufacturer / Address: Fabricant / Adresse:	COMET AG Herrengasse 10 CH-3175 Flamatt	
Produkte: Products: Produits:	Kühler Cooler Refrroidisseur	
Bezeichnung / Bestell- Nr. Type / Reference no. Type / No. de référence	XRC-3001-WA XRC-3001-WW XRC-4501-OA XRC-4501-OW XRC-1001-WA XRCA-3001-WA XRCA-5001-OA XRC-3012-WA XRC-3012-WW	10008640 10008641 10008642 10008643 20033773 20033337 20033338 / 20032910 20049308 20049309

Wir erklären hiermit dass die oben aufgeführte unvollständige Maschine den grundlegenden Sicherheits- und Gesundheitsanforderungen der **Maschinenrichtlinie 2006/42/EG** Anhang I entspricht. Die speziellen Technischen Unterlagen gemäss Anhang VII Teil B wurden erstellt.

*We hereby declare that the partly completed machinery named above satisfies the relevant essential health and safety requirements set out in the Annex I of the **Machinery Directive 2006/42/EC**. The technical file according to the Annex VII part B is available.*

Nous déclarons que la quasi-machine mentionnées ci-dessus satisfait aux exigences essentielles de santé et de sécurité pertinentes énoncées à l'annexe I de la **directive machines 2006/42/CE**. Le dossier technique conforme à l'annexe VII, section B est disponible.

Angewandete Normen
Standards applied
Normes appliqués

DIN EN ISO 12100-1 (2004-04)
DIN EN ISO 12100-2 (2004-04)
DIN EN 60204-1 (2009-10)
DIN EN 349 (2008-09)

Datum: **Dezember 2010**
Date: **December 2010**
Date: **Décembre 2010**

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