

Oil Cooling Pump OW 4002

Application

The OW 4002 is a water-recooled oil circulation pump designed to facilitate anode heat dissipation of X-ray tubes.

The heat energy produced by the X-ray tube is transferred via an oil/water heat exchanger.

The cooling aggregate is designed for re-cooling of tube-cooling oil for bipolar X-ray tubes. The water-cooled oil circulation pump system can cool X-ray tubes with 4200 W anode heat dissipation under conditions of constant operation if sufficient flow of cooling water at a low enough temperature is available.

A thermostat valve controls the oil temperature and minimizes water consumption.

If, for economical or technical reasons, a re-cooling of the tube-cooling oil from the water supply is not feasible, we recommend an air-recooled oil circulation pump.

The OW 4002 is equipped with a fail-safe turbine flow rate monitor.



Description

Function

The hot tube-cooling oil returns via the oil flow switch through the oil/water heat exchanger and - after cooling down - into the oil reservoir.

The oil reservoir is vented to the atmospheric pressure. The circulation pump drains the oil from the reservoir and feeds it to the oil outlet connector. The cooling water is supplied and drained through two hose connectors.

Electrical control

The OW 4002 cooling pump is connected by a 5-wire connecting cable supplying the circulation pump from the X-ray control unit and connects the safety circuits to the control to ensure safe operation of the X-ray tube.

Safety circuit

The safety circuit monitors the cooling oil supply to the X-ray tube. The circuit includes a fail-safe oil turbine flow rate monitor, which opens the circuit in case a minimum flow rate of the cooling oil (17 l/min) is not ensured.

A thermostat switch opens the circuit in case the cooling oil temperature exceeds the set temperature (50°C).

Both switches reconnect automatically after safe cooling is ensured.

Water supply

The heat dissipated from the X-ray tube and also the dissipation heat from the drive of the pump have to be transferred by the oil/water heat exchanger to the cooling water.

The water flow is controlled by a thermostat to maintain a constant oil temperature of 40°C. This, however, can only be accomplished if sufficient water flow rate and water temperature (see diagram) are provided.

Technical Data

Dimensions and Weight

Width	621 mm / 24.44 inch
Depth	350 mm / 13.8 inch
Height	551 mm / 21.7 inch
Weight	approx. 45 kg / 99 lbs (w/o oil)
Capacity	23 l (operation filling)
Oil connection	Non-interchangeable quick-action couplings
Water hose connection	NW 10 mm
Connecting cable	10 m / 32 ft long with plug connection

Power data

Cooling capacity	4200 W (see diagram)
Oil circulation quantity	> 17 l/min at 3,5 bar based on oil temperature 22°C ± 3°C
Cooling oil	S 5585
Power supply	230 V ± 10% / 50/60 Hz
Charging rate	3.6 A at 6 bar
Max. noise level	< 55 dB(A)
Protection class	IP 54

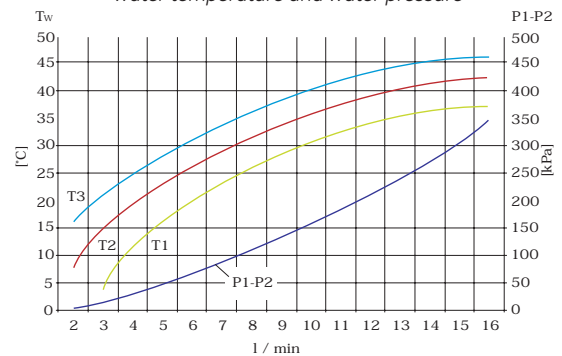
Environment conditions

Operating temperature	+5°C...+40°C
Storage temperature	-40°C...+70°C (w/o oil)
Relative humidity	20%...80%

Default Settings

Maximum pressure	9.5 bar
Oil-flow monitor (open)	14 l/min
Cooling water controller	40°C
Thermostat	50°C

Diagram OW 4002
Cooling power 4,2 kW, oil temperature subject to
water temperature and water pressure



T_w = temperature water inlet (supply)

P_1 = pressure, water inlet

P_2 = pressure, water outlet

pressure difference = $P_1 - P_2$

oil temperature in diagram:

$T_1 = 40^\circ\text{C}$ $T_2 = 50^\circ\text{C}$ $T_3 = 60^\circ\text{C}$

