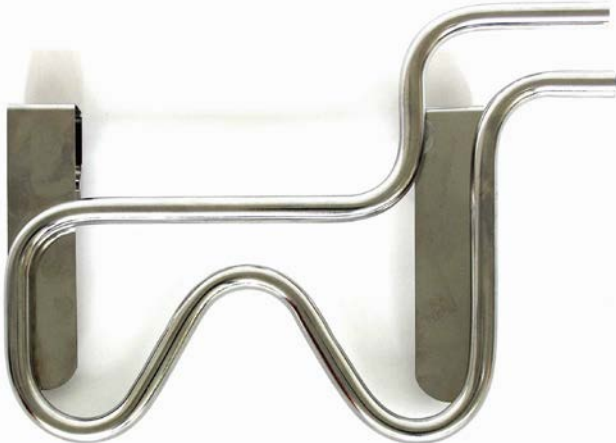


<p>Cooling coil for the connection to a cryostat</p>	
<p>Cooling coil for unit sizes Elmasonic S 30, S 40; S 70, S 150 Elma art. no. 103 8735</p>	
<p>Cooling coil for unit sizes Elmasonic S 60, S 80 – S 130, S 180, S 300 Elma art. nr. 103 7515</p>	

Intended use / operation

Cooling coil for the connection to a cryostat. The cooling coil stabilizes the temperature of the liquid*, e.g. in an ultrasonic cleaning unit, by counteracting the heat energy which is taken into the cleaning bath by the ultrasound.

During ultrasonic operation the ultrasonic energy transmitted into the cleaning liquid is transformed into heat in an ordinary physical process due to which the cleaning bath is continuously heated. If a specific cleaning bath temperature must not be exceeded (e.g. 40°C for the removal of proteins or for special laboratory applications), the use of a cooling coil is required to stabilize the cleaning bath temperature.

The cooling coil must be connected to a closed cycle cooling system (cryostat) only.

* The liquid in an ultrasonic tank may be cooled down to temperatures below the ambient room temperature only up to a certain degree to prevent the forming of condensation. For further information please see Section *Important instructions and limitations concerning the cleaning bath temperature*.

Technical details

Unit sizes S 30, S 40, S 70, S 150: dimensions w x h	ca. 180 mm x 130 mm
Depth of immersion / width of immersion	ca. 100 mm / 145 mm
Unit sizes S 60, S 80 – S 130, S 180, S 300: dimensions w x h	ca. 230 mm x 170 mm
Depth of immersion / width of immersion	ca. 145 mm / 200 mm
Inner diameter	Ø 7 mm
Outer diameter	Ø 10 mm

Suitable cryostats

For ultrasonic units with a capacity of up to 15 litres and an ultrasonic power (effective) of up to 200 watts we recommend the Julabo F250.

For ultrasonic units with a capacity of 15 – 28 litres and an ultrasonic power (effective) of up to 300 watts we recommend the Julabo FL300.

<http://www.julabo.de/>

Connection of the cooling coil to a laboratory cooling device

1. Use suitable hoses to connect the cooling coil to the available cryostat and secure the connection by means of hose clamps.
2. Hook the cooling coil onto the edge of the ultrasonic tank. The cooling coil must be completely covered in liquid.
3. Set the temperature of the cooling liquid at the cryostat. The cooling temperature set value depends on the capacity of the ultrasonic tank, on the ultrasonic energy taken into the bath and on the temperature required for the cleaning application.
4. Use a thermometer to check the temperature of the cleaning liquid regularly during operation to ensure that the temperature does not fall below the allowed limit temperature (see table page 3). For further information please see Section *Important instructions and limitations concerning the cleaning bath temperature*.

The operator is responsible for the monitoring of the cleaning bath temperature.

Please note: Any condensate that might form on the tube of the cooling coil or on the connected hoses is due to a physical process and does not pose any risk.

Cooling coil in a deep-drawn ultrasonic tank, connected



Cooling coil connected to a cryostat (Julabo F250)



Important instructions and limitations concerning the cleaning bath temperature

If the cleaning bath is cooled down to a temperature which is considerably lower than the ambient room temperature, condensate will form on the bottom of the ultrasonic tank. Condensate can cause damage to the unit (scorching in the electronics, on the transducer system, etc.).

The table below indicates at which temperatures and at which relative humidity of air the forming of condensate on surfaces of items (e.g. ultrasonic tank) starts.

Example: The room temperature is 25°C, the relative humidity of air is 60%. The forming of condensate on the surfaces of the ultrasonic tank starts at a temperature of 16.8 °C and lower.

Caution! The manufacture cannot be held liable for any damage, e.g. on the ultrasonic cleaning unit, on further equipment or on samples placed inside the ultrasonic tank, caused by inappropriate cooling. The operator is responsible for monitoring the temperature of the cleaning bath.

Taupunkt in °C in Abhängigkeit von Temperatur und relativer Luftfeuchtigkeit [%]											
Dew point (saturation temperatures) as a function of temperature and relative humidity [%]											
Temperatur/ Temperature [°C]	% relative Luftfeuchte / relative humidity [%]										
	1%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
15	-39.7	-15.8	-7.4	-2.2	1.7	4.8	7.4	9.7	11.6	13.4	15.0
16	-39.1	-15.1	-6.6	-1.3	2.6	5.7	8.3	10.6	12.6	14.4	16.0
17	-38.5	-14.3	-5.8	-0.4	3.5	6.7	9.3	11.6	13.6	15.4	17.0
18	-37.9	-13.5	-4.9	0.4	4.4	7.6	10.2	12.5	14.5	16.4	18.0
19	-37.3	-12.8	-4.1	1.3	5.3	8.5	11.2	13.5	15.5	17.3	19.0
20	-36.7	-12.0	-3.3	2.2	6.2	9.4	12.1	14.4	16.5	18.3	20.0
21	-36.1	-11.3	-2.5	3.0	7.1	10.3	13.0	15.4	17.5	19.3	21.0
22	-35.5	-10.5	-1.7	3.9	8.0	11.2	14.0	16.3	18.4	20.3	22.0
23	-34.9	-9.8	-0.8	4.7	8.9	12.1	14.9	17.3	19.4	21.3	23.0
24	-34.3	-9.0	0.0	5.6	9.7	13.1	15.8	18.2	20.4	22.3	24.0
25	-33.7	-8.2	0.8	6.5	10.6	14.0	16.8	19.2	21.3	23.3	25.0
26	-33.1	-7.5	1.6	7.3	11.5	14.9	17.7	20.2	22.3	24.2	26.0
27	-32.6	-6.7	2.4	8.2	12.4	15.8	18.7	21.1	23.3	25.2	27.0
28	-32.0	-6.0	3.3	9.0	13.3	16.7	19.6	22.1	24.3	26.2	28.0
29	-31.4	-5.2	4.1	9.9	14.2	17.6	20.5	23.0	25.2	27.2	29.0
30	-30.8	-4.5	4.9	10.7	15.1	18.5	21.5	24.0	26.2	28.2	30.0
31	-30.2	-3.7	5.7	11.6	16.0	19.5	22.4	24.9	27.2	29.2	31.0
32	-29.6	-3.0	6.5	12.4	16.8	20.4	23.3	25.9	28.1	30.2	32.0
33	-29.1	-2.2	7.3	13.3	17.7	21.3	24.3	26.8	29.1	31.1	33.0
34	-28.5	-1.5	8.1	14.2	18.6	22.2	25.2	27.8	30.1	32.1	34.0
35	-27.9	-0.7	8.9	15.0	19.5	23.1	26.1	28.7	31.0	33.1	35.0
36	-27.3	0.0	9.8	15.9	20.4	24.0	27.1	29.7	32.0	34.1	36.0
37	-26.8	0.7	10.6	16.7	21.3	24.9	28.0	30.6	33.0	35.1	37.0
38	-26.2	1.5	11.4	17.6	22.2	25.8	28.9	31.6	34.0	36.1	38.0
39	-25.6	2.2	12.2	18.4	23.0	26.7	29.9	32.6	34.9	37.1	39.0
40	-25.0	3.0	13.0	19.3	23.9	27.7	30.8	33.5	35.9	38.0	40.0

Table for determining the lowest possible cleaning bath temperature in relation to the ambient conditions.



Putting out of operation and waste disposal

Disposal of the packing in compliance with the valid local regulations only.

The cooling coil must be taken to a metal recycling station. Used components may also be returned to the manufacturer for waste disposal.

Manufacturer's contact address

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