

Heating- and Cooling Unit

Unit for double walled vessels and reactors
Operational use from -20°C up to 240°C

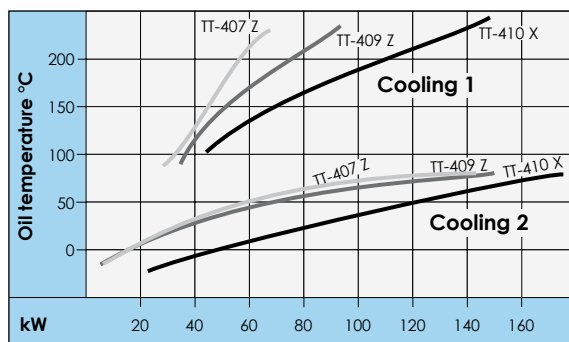
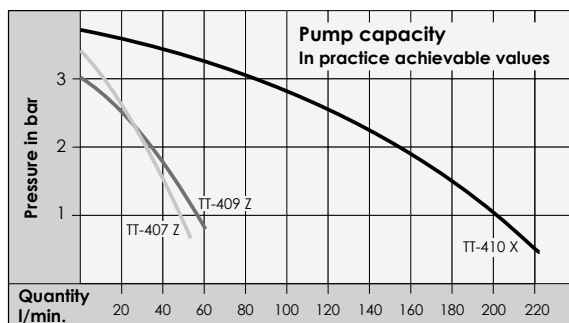
TT-407 Z 8 kW heating capacity
TT-409 Z 24 kW heating capacity
TT-410 X 48 kW heating capacity

reactor volume: up to 50 litres
reactor volume: 50 - 150 litres
reactor volume: 50 - 400 litres



Features included

- Self-optimizing temperature controller with digital display of the set and actual temperature. With high precision regulation in 1/10° range; can be adjusted to read °C or °F.
- Automatic temperature control – difference between set and actual temperature activates an alarm.
- Lime scale free heat exchanger.
- Digital flow indication with control of the minimum flow.
- All components in contact with water are made from corrosion resistant stainless steel.
- Heating with automatic cascade connection.
- Leak free high temperature pump with axial face. The pressure is displayed by manometer.
- Hot oil circuit with by-pass, which ensures internal circulation if valves are closed.
- No oil cracking because of special construction of the heating elements.
- Safety devices:
 - Automatic level control for dry run protection.
 - Electronic temperature limiter in the controller and separate mechanical safety thermostat.
 - Main switch, transformer and motor protection switch.
 - Horn in case of failure.
- All failures are visually indicated.



Particularities

- With regulation of pressure to adjust the pump pressure.
- Two-circuit cooling system for operations below zero degrees.
- Reversing switch for temperature controlling in the reactor. Possibility to measure the temperature in the reactor with an external temperature sensor.



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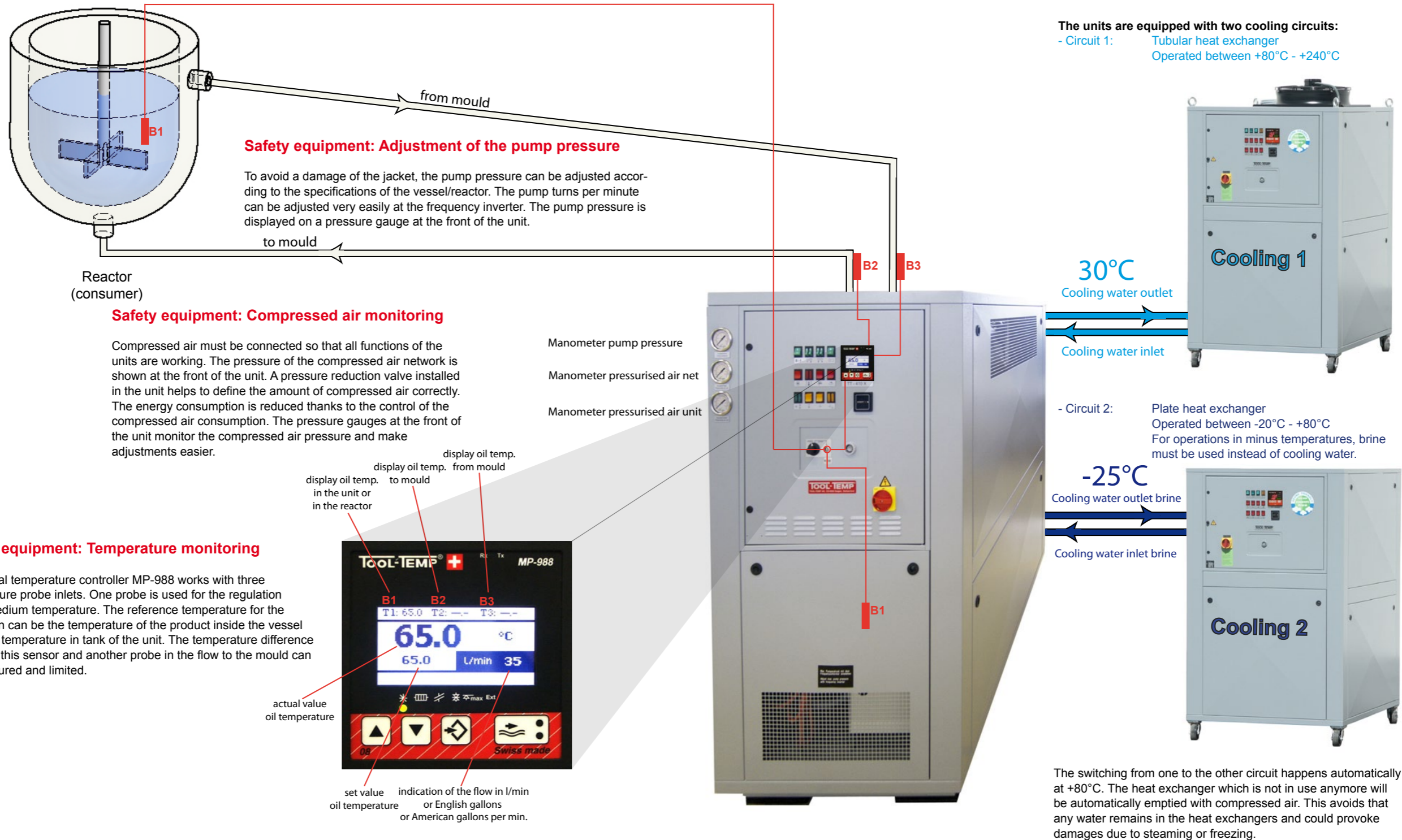
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Heating and cooling units for double walled vessels and jacketed reactors

The models TT-407 Z, TT-409 Z and TT-410 X are heating and cooling units dedicated to the temperature regulation of double-wall vessels and reactors. These units can be operated with heat transfer liquid until a maximum temperature of +240°C.

Thanks to low-loaded heating elements and a high flow rate of the medium, cracking of the oil is impossible. Therefore the lifetime of the oil is maximised. The standard temperature controller is an MP-988 with three temperature probe inlets. Three different temperatures can be displayed. The temperature regulation can be based on the product temperature inside the vessel or on the oil temperature inside the tank of the unit.

The units are equipped with two independent heat exchangers. In the range +80°C until +240°C, the cooling happens over the cooling circuit no. 1 with a tubular heat exchanger. From +80°C down, the unit switches automatically to the cooling circuit no. 2 with plate heat exchanger. The cooling circuit no. 2 can be operated with brine to achieve oil temperatures down to -20°C.



Technical data:

There are 3 different models available

	TT-407 Z	TT-409 Z	TT-410 X
Temperature range	-20°C up to +240°C with heat transfer liquid		
Temperature control	self-optimizing, electronic microprocessor controller MP-988 with digital display of the set and actual value. Automatic temperature monitoring.		
Flow control	electronically, with digital display and automatic control of the minimum flow.		
Heating capacity (oil) <i>Switchable in stages</i>	8 kW 3 / 5	24 kW 8 / 8 / 8	48 kW 8 / 8 / 16 / 16
Cooling capacity			
<i>Cooling 1</i>	67 kW at 230°C	93 kW at 230°C	150 kW at 230°C
<i>Cooling 2</i>	143 kW at 80°C	150 kW at 80°C	175 kW at 80°C
Pump capacity <i>Pressure mode</i>	motor 1,8 kW max. 3,5 bar max. 55 l/min	1,8 kW max. 3,0 bar max. 60 l/min	4,0 kW max. 4,0 bar max. 230 l/min
Expansion tank capacity	21 litres	46 litres	96 litres
Filling amount	11 litres	60 litres	75 litres
Expansion volume	16 litres	36 litres	75 litres
Connections			
<i>Oil circuit</i>	¾" BSP female thread	1" BSP female thread	flange DN32/PN16
<i>Cooling water</i>	¾" BSP female thread	¾" BSP female thread	1½" BSP female thread
<i>Water-glycole</i>	¾" BSP female thread	¾" BSP female thread	1½" BSP female thread
<i>Air pressure</i>	min. 5 bar		
Dimensions (L×W×H)	1'140 × 480 × 1'400	1'380 × 720 × 1'500	1'710 × 790 × 1'540
Weight (empty)	approx. 220 kg	approx. 340 kg	approx. 590 kg
Colour	silvergry RAL 7001		

All possible voltages are available from 3 x 200 V to 3 x 600 V and 50/60 Hz. The units are available conform to UL/CSA specifications. For the USA market the units are equipped with NPT-thread connections and the controller is adjusted to indicate °F.

Electronic temperature controller MP-988

The electronic controller MP-988 can be operated to read °C or °F. The analog interfaces 0-5 V, 0-10 V and 4-20 mA are standard included in the controller - **without additional costs**.

The self-optimizing feature on this controller allows a very high regulating accuracy even at high temperatures and adheres to the set temperatures independently of the consumer size.

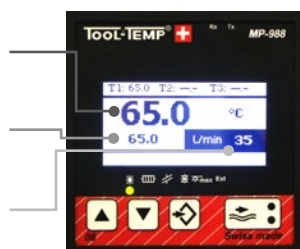
Flow control:

The indication of the flow rate is possible in litres or gallons per minute. As soon as the flow falls below a minimum, the alarm is activated.

Actual temperature
(effective temperature)

Set temperature
(required temperature)

Indication of the flow



Analog interfaces

- 0 - 5 V, 0 - 10 V, 4 - 20 mA

Digital interface

- on request

Temperature difference monitoring

Indication of up to three temperatures



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