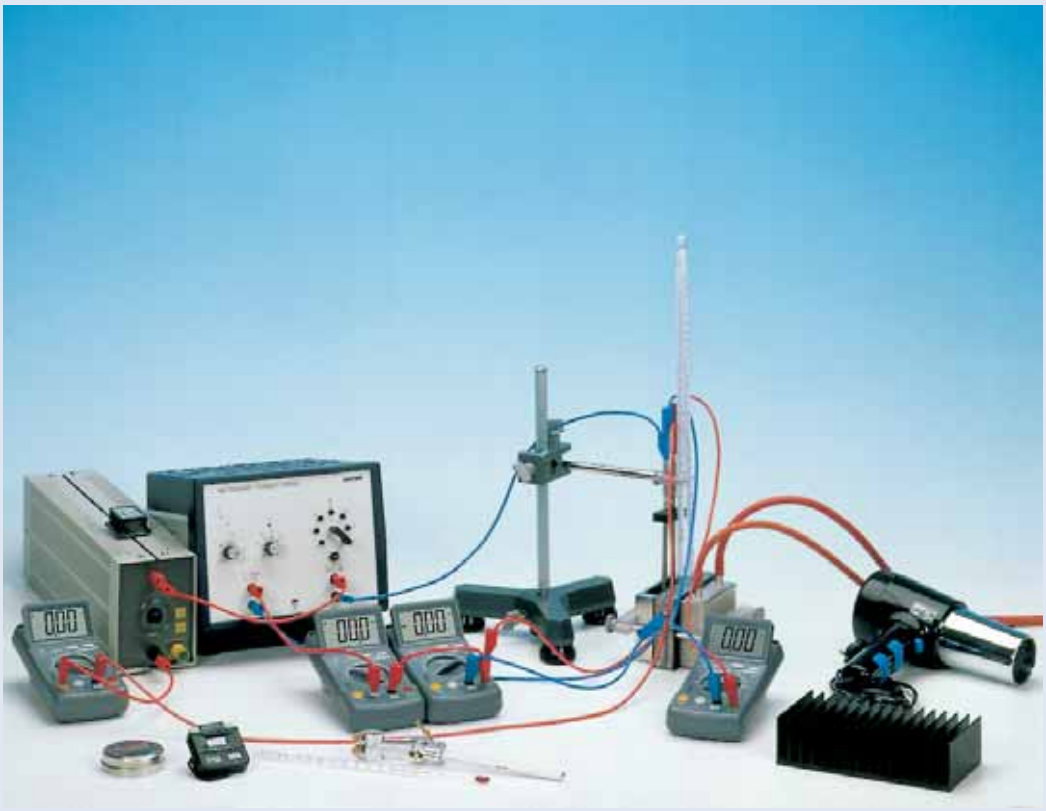
4.1.08-00 Peltier heat pump



What you can learn about ...

- ➔ Peltier effect
- ➔ Heat pipe
- ➔ Termoelectric e. m. f.
- ➔ Peltier coefficient
- ➔ Cooling capacity
- ➔ Heating capacity
- ➔ Efficiency rating
- ➔ Thomson coefficient
- ➔ Seebeck coefficient
- ➔ Thomson equations
- ➔ Heat conduction
- ➔ Convection
- ➔ Forced cooling
- ➔ Joule effect

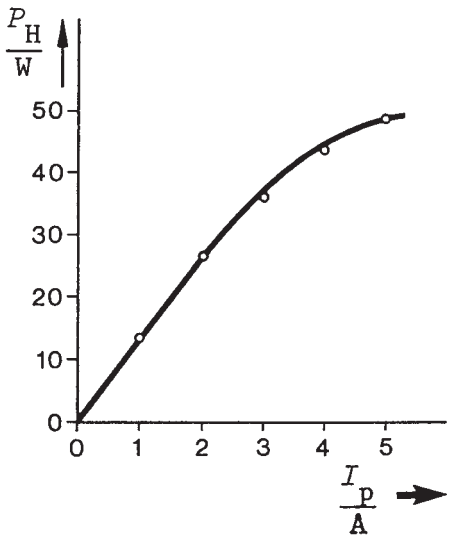
Principle:

The cooling capacity heating capacity and efficiency rating of a Peltier heat pump are determined under different operating conditions.

What you need:

Thermogenerator	04366.00	1
Flow-through heat exchanger	04366.01	1
Air cooler	04366.02	1
Heating coil with sockets	04450.00	1
Distributor	06024.00	1
Rheostats, 33 Ω, 3.1 A	06112.02	1
Connecting plug, pack of 2	07278.05	1
Power supply, universal	13500.93	1
Digital multimeter 2010	07128.00	4
Stopwatch, digital, 1/100 s	03071.01	1
Hot/cold air blower, 1700 W	04030.93	1
Laboratory thermometers, -10...+100°C	38056.00	1
Precision mercury thermometers, -10...+ 50°C	38033.00	2
Rubber tubing, d_i = 6 mm, l = 1 m	39282.00	1
Universal clamp	37718.00	1
Tripod base -PASS-	02002.55	1
Support rod -PASS-, square, l = 250 mm	02025.55	1
Right angle clamp -PASS-	02040.55	1
Connecting cable, 4 mm plug, 32 A, red, l = 25 cm	07360.01	3
Connecting cable, 4 mm plug, 32 A, red, l = 50 cm	07361.01	3
Connecting cable, 4 mm plug, 32 A, blue, l = 50 cm	07361.04	2
Connecting cable, 4 mm plug, 32 A, blue, l = 75 cm	07362.04	2
Connecting cable, 4 mm plug, 32 A, red, l = 75 cm	07362.01	1
Heat conductive paste, 50 g	03747.00	1

Complete Equipment Set, Manual on CD-ROM included
Peltier heat pump P2410800



Pump cooling capacity as a function of the operating current.

Tasks:

1. To determine the cooling capacity P_c the pump as a function of the current and to calculate the efficiency rating hc at maximum output.
2. To determine the heating capacity P_w of the pump and its efficiency rating hw at constant current and constant temperature on the cold side.
3. To determine P_w, η_w and P_c, η_c from the relationship between temperature and time on the hot and cold sides.
4. To investigate the temperature behaviour when the pump is used for cooling, with the hot side air-cooled.