Benchmark source systems for heat pumps

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Thermal power heatpump **10,0 kW**

Waterflow **3,70 m³/h**

Delta T **2,00 K**

	Erdspeicher mit 100 Stück thermoaktiven Betonstäben	Tiefsonden 2x100 m	160 Meter Ringgraben Tiefe 2.500	400m² Flachkollektor 8 Kreise á 120m
Outside diameter	4,3 mm	32,0 mm	32,0 mm	20,0 mm
Inside diameter	2,7 mm	26,2 mm	26,2 mm	16,0 mm
Wall thickness	**0,8 mm**	2,9 mm	2,9 mm	2,0 mm
Length of pipe	7 m	200 m	300 m	120 m
How much pipes parallel	1000 St.	4 St.	2 St.	8 St.
Waterflow each parallel pipe	0,06 l/min 3,70 l/h	15,42 l/min 925,00 l/h	30,83 l/min 1850,00 l/h	7,71 l/min 462,50 l/h
Lost pressure source system	**0,039 bar**	0,209 bar	1,056 bar	0,388 bar
Area heat efor heat exchanging	**135 m²**	80 m²	60 m²	60 m²
Necessary difference temperature for thermal flow	0,20 K	1,20 K	1,60 K	1,11 K
Temperature source average/minimum	7°C/3°C	8°C/4°C	7°C/2°C	5°C/0°C
Temperature source average/minimum (reload with summer cooling and air energy)	**16°C/12°C**	ineffizient	ineffizient	ineffizient
Mass of plasic material	79 kg	233 kg	175 kg	121 kg
System liquid filling	77 Ltr.	451 Ltr.	343 Ltr.	120 Ltr.
Active earth volume	**254 m³**	157 m³	168 m³	320 m³
Necessary working hours for digger the ditch	**3 h**	7 h	67 h	67 h
Length of ditch	10 m	10 m	160 m	20 m
Width of ditch	1,5 m	0,5 m	1,5 m	20 m
Deep of ditch	1,5 m	1,0 m	2,5 m	1,5 m
Saved with concrete	**Ja**	Nein	Nein	Nein