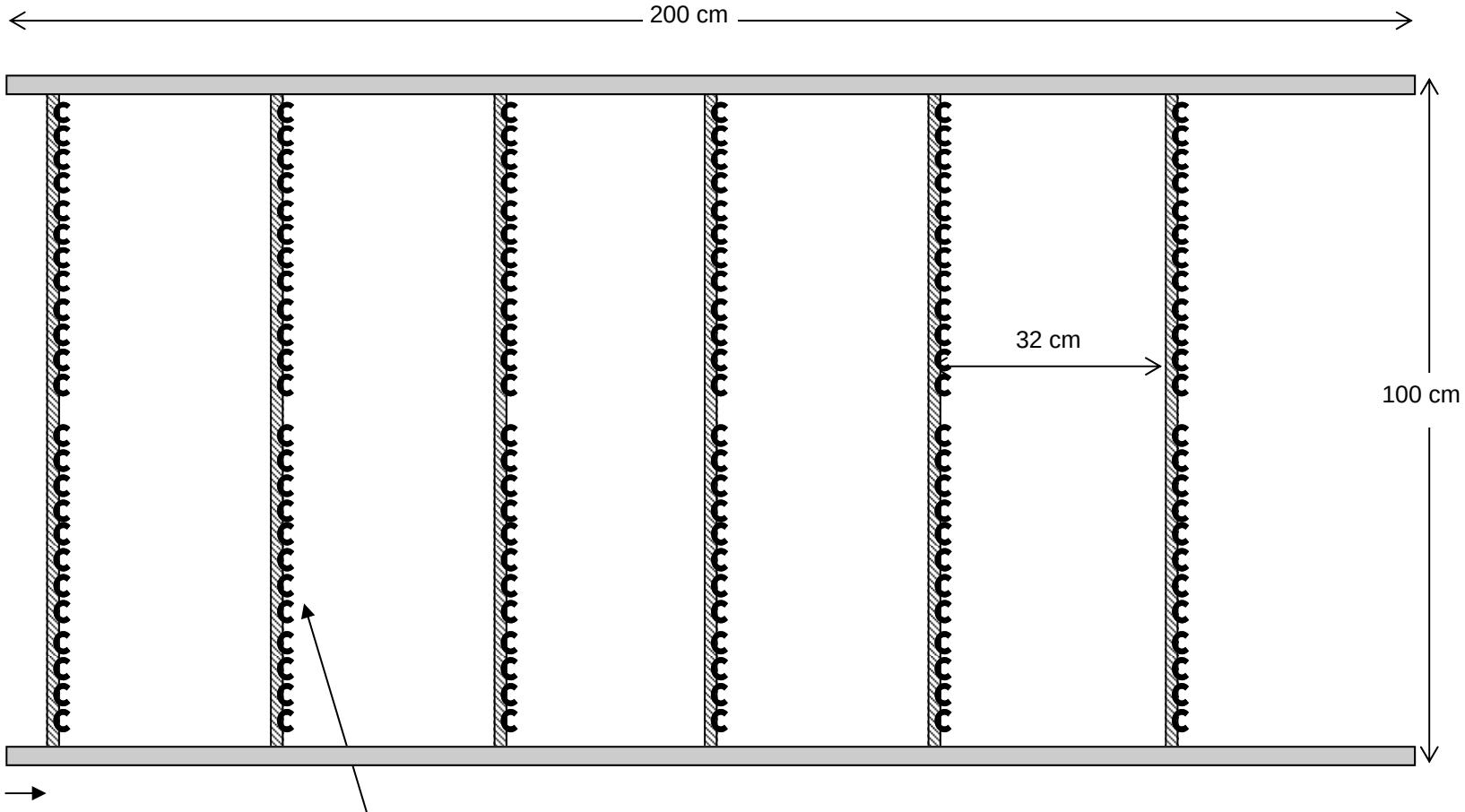
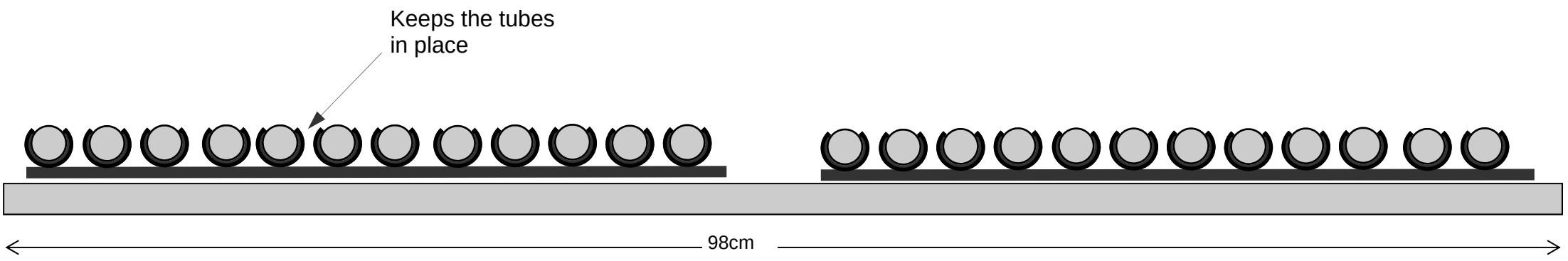
Jan 2012

Energy absorber for heat pump systems

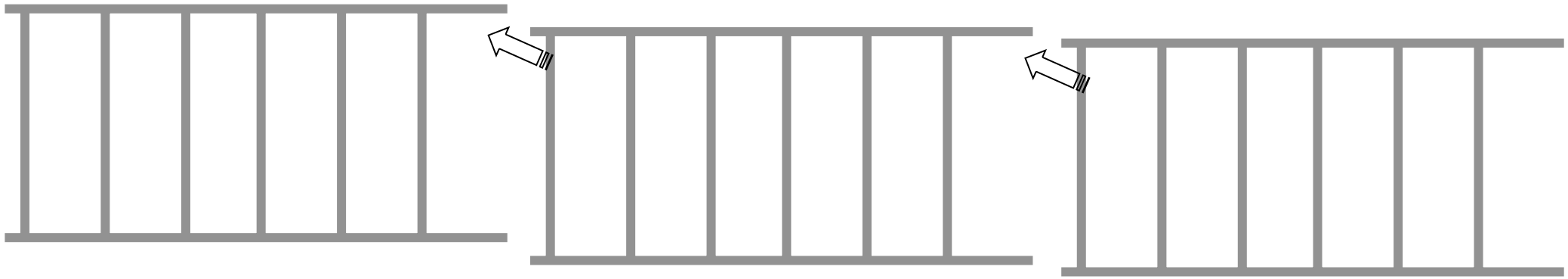
Description with mounting instructions

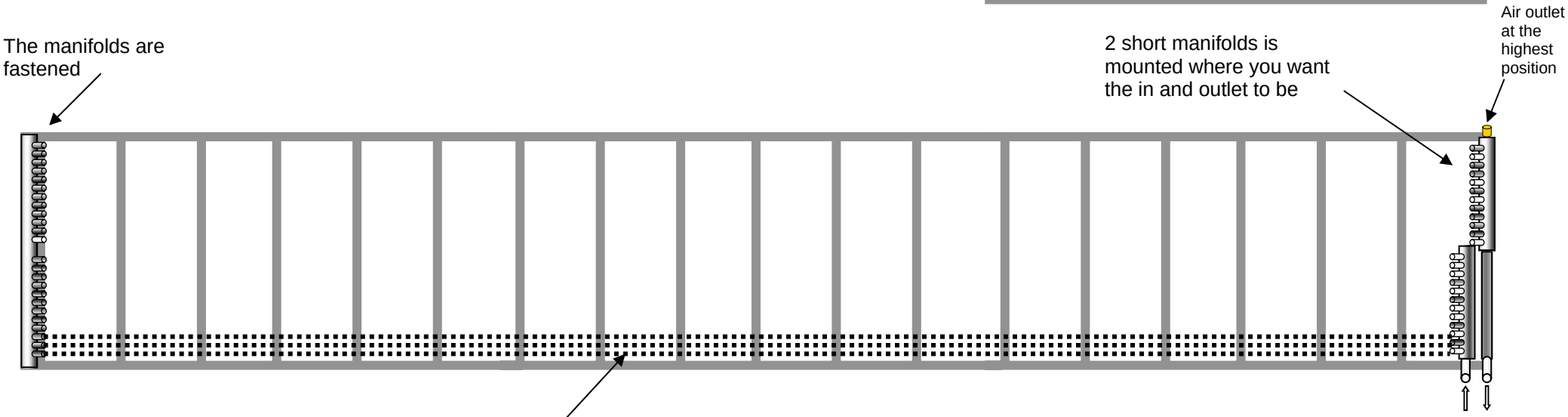
Fence element
200 x 100 cm
for 50 meter PE/PP corrugated tube Ø = 25 mm



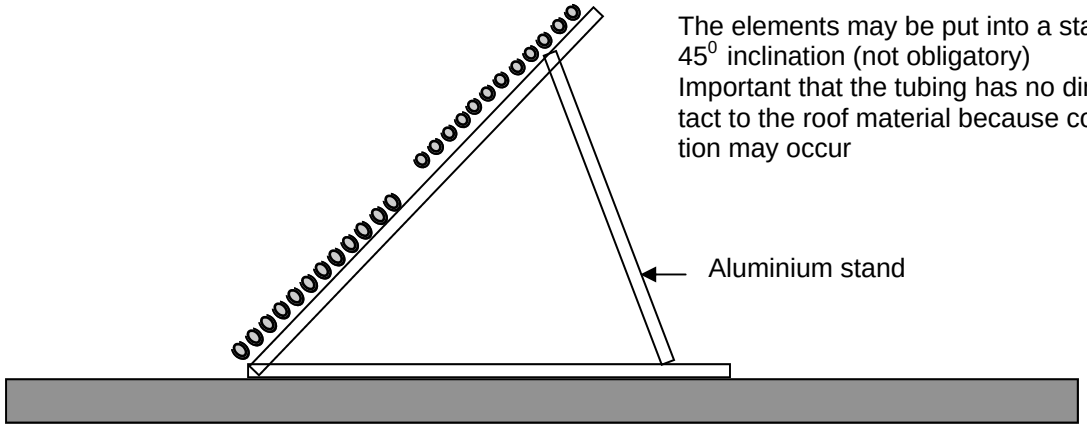


The elements are put together

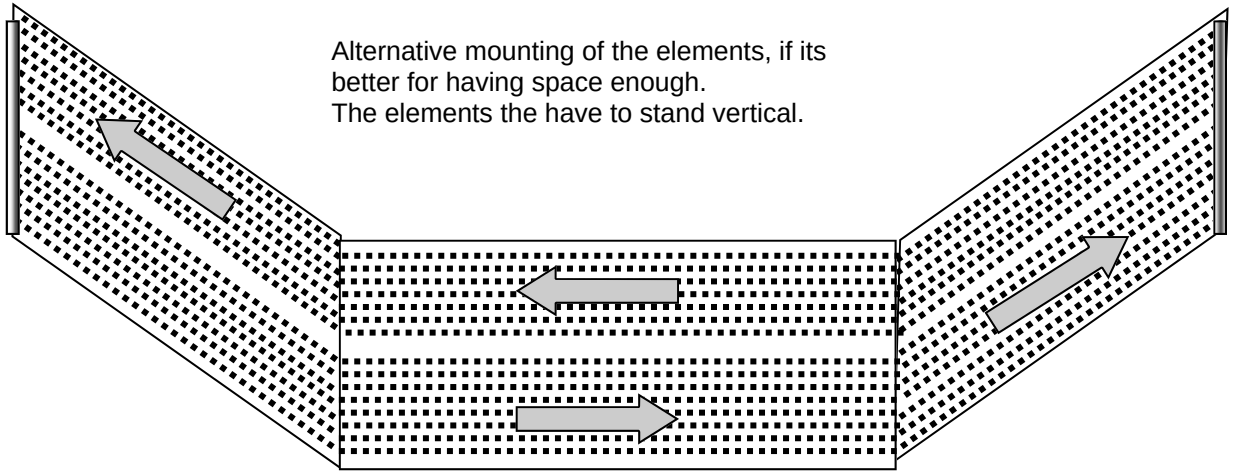




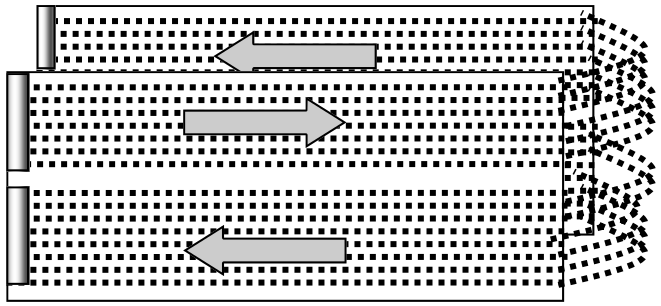
Be sure that the element are horizontal so that the air can get out.
25 mm corrugated tube is mounted between the manifolds and is to be pressed into the fasteners



The elements may be put into a stand with 45^0 inclination (not obligatory)
Important that the tubing has no direct contact to the roof material because condensation may occur



Alternative mounting of the elements, if its better for having space enough.
The elements the have to stand vertical.



If it has to be smaller!

The elements may be mounted respectively on front and back of the posts. The energy collector the only needs half the space.
Possibly put a little shield in front.
Shrubs or fence which the wind can easily pass

Dimensioning combined with tubes in the ground

Rule of thumb:
Install 1 item per 2 kW output of the heat pump.
That is a 6 kW heat pump requires 3 elements of 2 meters
It also depends on the dimensioning of earth tubes. The smaller hose, the more energy prisoners advised. The same applies if the soil is very sandy.
Exact figures can not be given because conditions vary greatly.

What is the output from an energy collector:

Under typical weather conditions with little wind and moisture in the air, 1 element of 2 m^2 can provide approx. 2 kW for the heat pump system (as heating of the tubes in the ground)
This implies that the temperature of the soil is reaching a significantly higher level than otherwise.
This increases the COP and the power in kW which the heat pump can deliver, so that there will be used less auxiliary energy such as from an electric element.
1 meter tube in the energy fence capture approximately equal. to 1 meter pipe in the ground - on average. On cold, frosty days its less and on other days more. So it's nice that you can store heat from the good days in the ground.

Other data:

Max length of an energy fence: ca. 50 meter
Content of fluid: …… 8 litre/meter energy fence
Recommended flow:…… 100 litre/hour/meter energy fence
Max pressure:…… 1 bar (min 0,5 bar)

Control unit: Danotek DTC 2100 with 2 sensors (temperature).
Please read the instruction manual for this

Usually the built-in pump control is not suitable for this purpose.

New opportunities:

An energy collector makes it possible to establish geothermal heat with tubes in the ground under a house - or on rocky ground, where you usually have to make deep and expensive wells.
This can definitely be saved, if you use an energy collector.
An improved operation and cheaper plants as possible.

Price calculation of energy fence

Not including VAT, mounting and freight

Item number	For a system you need:		
160030	Basic element, manifold, 2 meter aluminium profiles, 50 m corr. 25 mm tube	=	490 €
160020	+ standard 2 meter element with 50 m PE tubing á 260,- € each……	=	€
160040	connecting part with pump, valves etc.…….. ……..	=	335 €
100033	DTC 2100 differential control unit ……..	=	248 €
200220	Astore connector 90° ø = 25 mm ……..…á 6,50 €	=	€
200380	Astore connector streight ø = 25 mm ……..á 5,50 €	=	€
200525	Sensor 3 meter …… …….. á 19,00 €	=	€
200520	Sensor 10 meter ……...á 28,00 €	=	€
160010	Stand for roof mounting……..……...á 40,50 €	=	€
400585	25 mm smooth PE tubing…….....á 2,70 €/m	=	€
		Total	€

Additional cost for black powder paint on the elements

25 mm corrugated tube is available in rolls of 50 meters
This is an extraordinarily strong quality

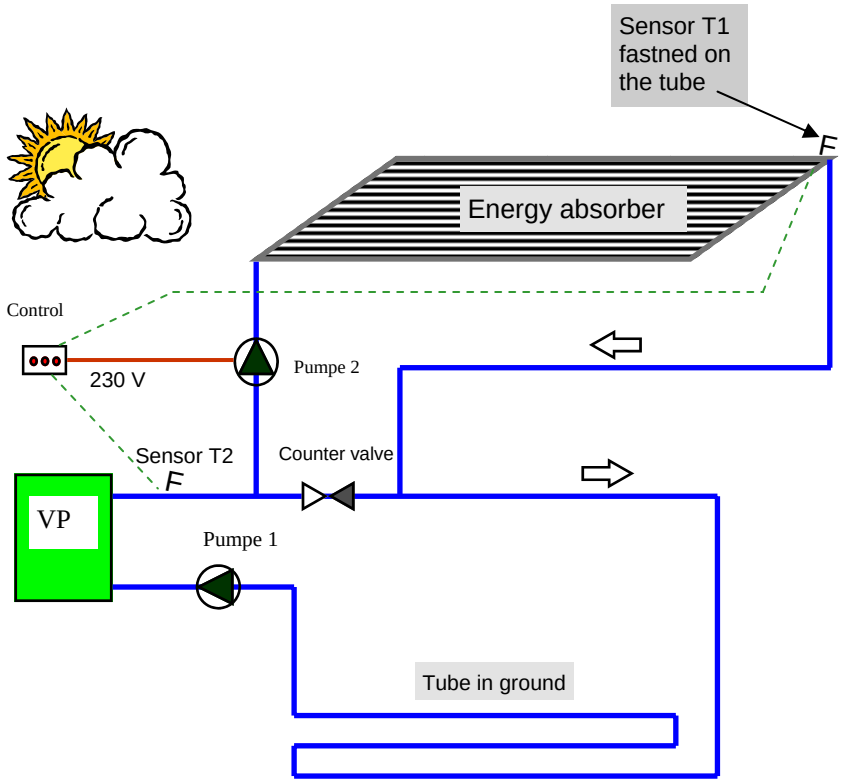
The material is tested over many years both in Denmark and abroad.
Life expectancy over 15 years in the sunlight.
Actually, it is possible eg after 10-12 years to turn the tubes 180 degrees around so they get UV radiation on the other side.

Datasheet can be sent on request.

www.solarventi.dk tel: + 45 8696 6700

Subject to change - jan. 2012

Principal drawing of a heat pump system with energy absorber and tubing in the ground



Function of the system:
When T1 is 5 degrees warmer than T2 the pump 2 starts and heat up the ground tubes.

When the heat pump is running, the fluid is some 5 degrees colder than the ground, and therefore the energy absorber will be able to produce even more, while its more cooled down.

When this extra cold fluid first pass through the energy absorber, it will save energy from the ground.

		SolarVenti
		Energy fence packing list *Sample*
Quantity	Part no	
8	**160020**	2m element
16	600101	Alu angel profile 30x30x3x1995
48	500538	U profil 20x40x20x1,5x995 with tube fasteners
14	600100	Angel profile 30x30x3x0,1 for connecting elements
32	600075	Z -profile alu 20x30x30x0,08 for fastening
1	600200	End profile nr 1 100x55x100x995
1	600205	End profile nr 2 65x55x65x995
7	700402	Bolt M6x70 A2
116	700381	Bolt M6x15 A2
123	700610	Nut M6 A2
64	700157	Screw 5,0x50 A2
400	100656	Corrugated tube Ø 25 mm PE extra strong
1	**160030**	**Connecting part**
1	900057	Manifold Ø 50mm 24 nipples air outlet
2	900055	Manifold Ø 50mm 12 nipple / 25 mm tube outlet
50	900075	Rubber (EPDM) gasket - o-let
0		PE smooth tube Ø 25 mm
0	300380	Astore connector ø 25 mm
1	**160040**	**Pump and connecting fittings**
1	300730	MS 1" Union
1	200175	Pump UPS 25-40 130 mm
2		MS pumpeforskruninger 1"
4		MS Teer 1" 1" 1"
1		MS counter valve 1" n/n
2		MS valve 1" n/n
2	300655	Outlet valve ½" 3/4"
2		Isofix 1" 25 mm
2		Isofix 1" 32 mm
1	300630	Air outlet screw 1/2"
1	301340	Key for air outlet screw
1	**200640**	**Differential coltrol box with display**
1	200645	DTC 2100
1	200525	Sensor with 3 m cable
1	200520	Sensor with 10 m cable
0	160010	Stand for roof mounting (optional)

Remark, that anti freeze fluid is not included. Use the same as in tubes in ground

Step one of the assembling

Assembling on the ground and then put up on the roof

Higher temperature in the ground = higher COP

Save at least 50% tubing in the ground. It gives the possibility to put tubing under a house or on rocks.

Its possible to capture approx. 1500 kWh/m^2 energy absorber

20 years experience

The tubing is made of high quality materials.