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AN ENVIRONMENTALLY FRIENDLY HEAT PUMP - TODAY AND TOMORROW -

Octopus has developed and produced heat pumps since 1981 and has, through many years of development, taken forward the best possible solution for the environment and the customer.

The latest product IS (Ice-Stick) has been developed and been renewed since 1991 and exists today in Sweden, Norway, Denmark, Finland, Estonia, Lithuania, Poland, Germany, Holland, Italy, Romania, Canada and Ireland.

The customer is our focus and our principles are simplicity, environment and cost effectiveness. This governs all activity in Octopus and Hotfoot and we focus on production, installation and service.



THE ICE-STICK HEATS EFFICIENTLY AND ENVIRONMENTALLY FRIENDLY

Our heat pump, the Ice-Stick, is a complete solution, very simple to install and commission. You don't need a large site or garden as the Ice-Stick can be as close as 1m from the premises.

The energy for heating comes from nature when the aluminium profiles condense the steam in the air to water and later pass on to become frost, hence the name "Ice-Stick".

With this heat pump the heating of your house, warehouse, weekend cottage etc. will be a lot more cost-effective than, for example oil or direct electrical. With a heat exchanger the heat is transferred to the water carrying system in the building.

The Ice-Stick can be easily retro fitted to your current water carrying system, i.e. oil, pellets, electrical, gas or district heating.

WHY AN ICE-STICK?

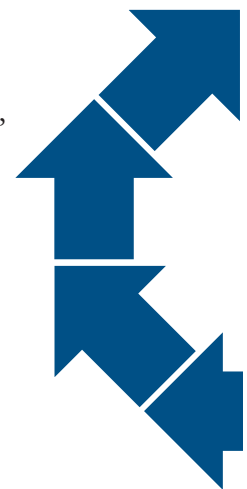
The Ice-Stick saves energy in an environmentally friendly way and is ideally suited to our climate.

Once the Ice-Stick is installed, set the temperature you desire to have in the house, the rest is done by the Ice-Stick year after year. That is how simple an Ice-Stick is.

With the Ice-Stick you will not destroy the whole of your garden or risk contaminating our already hard strained ground waters.

The Ice-Stick uses only nature's forces when defrosting itself (no bought energy from fans). The safe operation depends on the simple design.

The Ice-Stick only depends on one moving part - the compressor. Little or no maintenance is required. The compressor should last twenty years.



SIMPLE CONTROL THAT GIVES AN EVEN INDOOR TEMPERATURE

The Ice-Stick knows of the indoor temperature and then governs both the compressor and boost heat. It also knows the heat pump water temperature and the pressure in the refrigerant circuit and checks that a machine kind operation is maintained.

The need for heat in a house depends on many different factors. A big part of the year it is enough with energy from sun, people and household devices. During autumn, winter and spring, however the house will need to be heated some more. How much more varies depending on the house's energy density, ventilation, household heat, outdoor temperature, rains, distortion and sun.

OctoEL (the Ice-Sticks control system) deals with this. It will only produce the amount of heat the house needs in order to hold an even indoor temperature. With the OctoEL it never produces more heat than needed, a lowest possible condensing and thereby also **highest possible saving**.

" A BRILLIANT AND SIMPLE DESIGN "

THE PRINCIPLE OF A HEAT PUMP

1. The heat occupying part - low pressures

This part of a heat pump is called the evaporator. Through the evaporator the refrigerant runs with a low temperature and boiling point. The evaporator is heated by nature and this causes the refrigerant to evaporate.

2. Pressure increasing part - high pressures

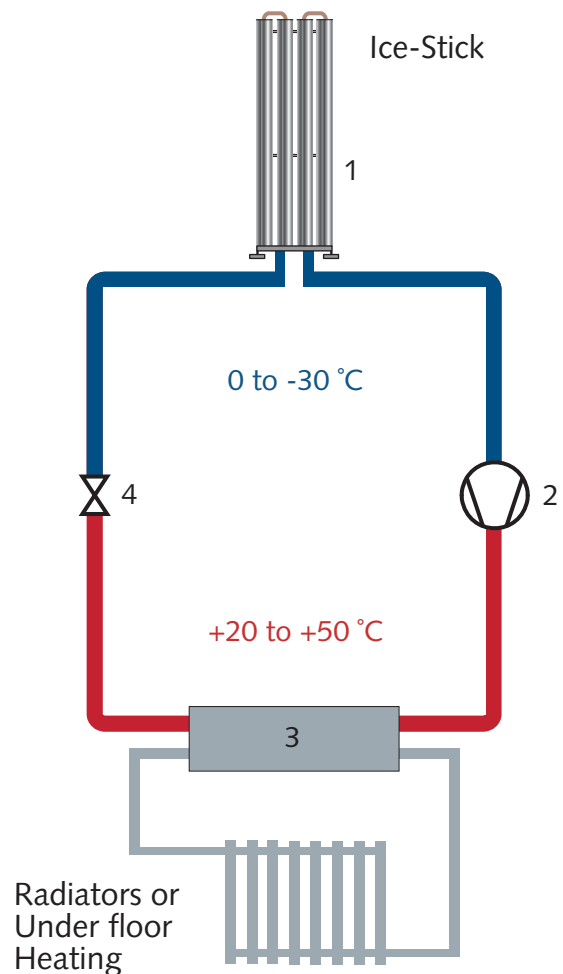
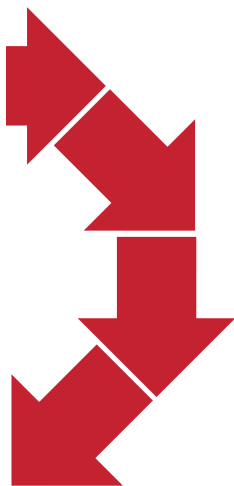
This part is the compressor. The warmed refrigerant is compressed and the pressure increases so that both the temperature and its condensing point ascend strongly.

3. Heat giving part - high pressures

This part of the heat pump transfers the heat to the house and is called a heat exchanger. The refrigerant passes through the heat exchanger with a high-temperature and condensing point. In the heat exchanger the refrigerant is cooled down by the house heating (e.g. radiators, floor heating), which leads to the refrigerant condensing.

4. Pressure lowering part - low pressures

This part consists of an expansion valve which expands the cooled refrigerant. This lowers the pressure which results in a substantial lowering of temperature and boiling point of the refrigerant.



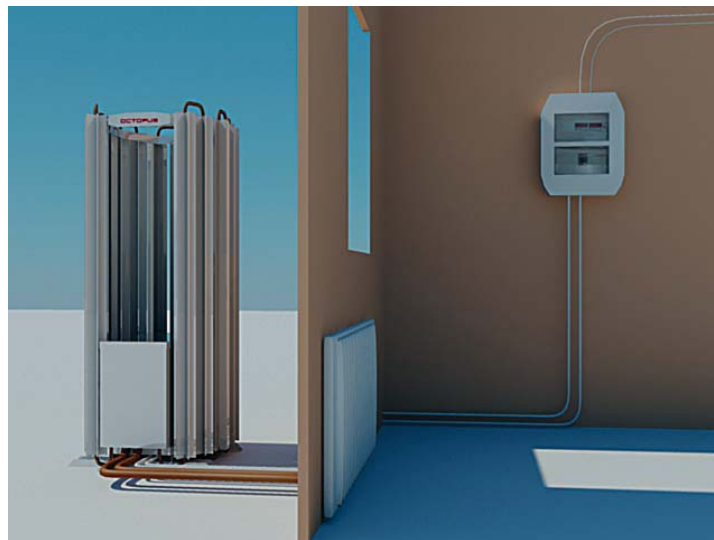
INSTALLATION ALTERNATIVES

We have chosen to do the Ice-Stick in two different designs. One unit called X and the other called Xp.

The different alternatives can simply be docked to the existing water carried systems e.g. oil, pellets, electrical, gas or district heating.



Xp means that the heat pump module stands detached from the Ice-Stick and thereby can be placed where it is most appropriate. In the boiler-room or next to the house body. With an Xp the area between the Ice-Stick and heat pump module will function as ground source.



X means that the heat pump module is placed in the Ice-Stick thereby it is two insulated water tubes and two electricity cables that have to be drawn between the house and the Ice-Stick. The control OctoEL is placed indoors.

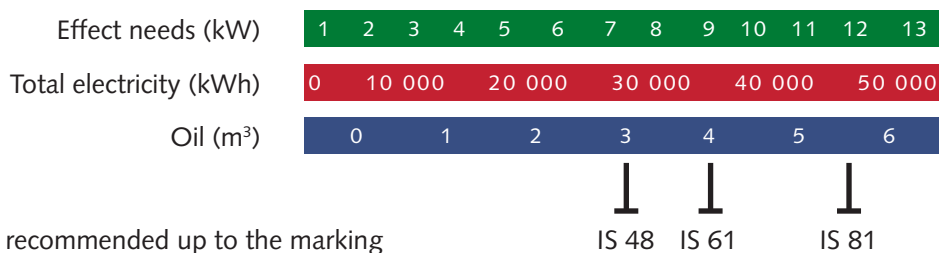
TECHNICAL DATES

Models Octopus™ IS	Unit	IS28X/XP	IS48X/XP	IS61X/XP	IS81X/XP
AI-Profiles	pcs	8	12	12	2 x 12
Electrical		230V, Single Phase 400V, N3-phase	230V, Single Phase 400V, N3-phase	230V, Single Phase 400V, N3-phase	230V, Single Phase 400V, N3-phase
Fuse	A	10	10	10	16
Compressor, type	Danfoss	Scroll	Scroll	Scroll	Scroll
Compressor, max input	kW	1,8	3,0	3,7	5,0
Compressor, volume	m³/h	6,8	11,41	14,4	19,2
Max HP water carried	°C	55	55	55	55
Refrigerant Gasol/R290	kg	~1	~1	~1	~2
Closing pressure min/max	bar	1,5/23	1,5/23	1,5/23	1,5/23
Closing temperature evaporating/condensing	°C	-33/+64	-33/+64	-33/+64	-33/+64
Dimension evaporator (WxDxH)	mm	800x840x2220	810x980x2220	810x980x2220	2 x 810x980x2220
Dimension HP module (WxDxH)	mm	515x555x630	515x555x630	515x555x630	515x555x630
Weight evaporator	kg	65	97	97	2 x 97
Weight Heat pump module	kg	75	87	92	102
Control unit		OctoEL 10	OctoEL 10	OctoEL 10	OctoEL 16

OUR MODELS

- IS 28 For the smaller house up to 100sqm with low energy consumption.
- IS 48 For the larger house up to 300sqm with a normal energy consumption.
- IS 61 Combine this model with 30 metres land loop and get more energy the coldest days.
- IS 81 For large houses and industrial/commercial premises. This model comes with two Ice-Sticks.

Choose one of the lying piles and then choose the heat pump model.



The model is recommended up to the marking

IS 48 IS 61 IS 81



HOUSE IN Wicklow Town, CO WICKLOW

Construction year	2006
Heated area	275 m ²
Heat pump model	1 unit IS 48X
Heating system	H ₂ O floor heating
Temperature needed	22 degrees
House electricity incl heating	7.800 kWh/annum
Boost	Electric

ENERGY SAVINGS WITH OCTOPUS ENERGY AB

1,800 sqm Pig Farm in Radbjerg, DENMARK

A pig farmer and his son decided to use the "Ice-Stick" when they built their new pig farm. They felt that oil was not environmentally friendly or economical.

Since January 2007 when the building was constructed some minor adjustments had to be made to integrate the Octopus system.

Today over 2000 piglets are kept at 25 degrees.

The Facts:

- In use January 2007
- Heated area 1800 m²
- 3 units of IS 81XP were installed
- Heat distribution is under floor heating
- Temperature requirement is 25 degrees
- **2007 consumption 27000 kWh**



The happy pig farmer





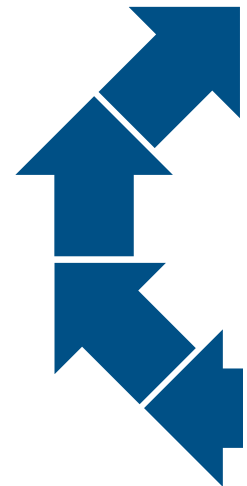
HOUSE IN TYRINGE, SCANIA, SWEDEN

Construction year	2003
Heated area	265 m ²
Heat pump model	1 unit IS 48X
Heating system	H ₂ O floor heating
Temperature needed	22 degrees
House electricity incl heating	9.600 kWh/annum
Boost	3 m ³ wood/annum



INDUSTRIAL BUILDING IN ESLÖV, SCANIA, SWEDEN

Construction year	1999
Heated area	840 m ²
Heat pump model	2 units IS 42X
Heating system	H ₂ O floor heating
Temperature needed	21 degrees
Electricity	22.000 kWh/annum





MECHANICAL WORKSHOP IN ESLOV, SWEDEN

Construction year	1998
Heated area	900 m ²
Heat pump model	2 unit IS 48X
Heating system	H ₂ O floor heating
Temperature needed	21 degrees
House electricity incl heating	22.500 kWh/annum
Boost	electricity



HOUSE IN MALMO, SWEDEN

Construction year	1850
Heated area	150 m ²
Heat pump model	1 units IS 48X
Heating system	water radiators
Temperature needed	21,5 degrees
Electricity	13.000 kWh/annum
Boost	electricity

