HELIOTHERM
The Heat Pump

Company Presentation

HELIOTHERM
The Heat Pump

Research and Development Center

Manufacturing facility | Training center | Competence headquarters

HELIOTHERM
The Heat Pump

Milestones

1987 First European HP manufacturer to use original Scroll Compressor Technology
1994 First Heliotherm modulating heat pump
1996 dsi® regulated refrigerant technology developed
1997 Heliotherm tele control® developed
2000 Cooperation with an external company for CO2-probe-development
2002 "High Performance Monitoring"
2003 web control® 321 – World's first internet controlled heat pump
2004 Market leader > web control® Ground Source heat pump
2005 World wide first fully modulating heat pump developed
2006 Heliotherm Competence Center Tirol designed and built
2007 First tested heat pump to achieve a COP of >7
2009 Research & Development Center Headquarters designed and built
2010 Development of R & D – Strategy and Focusing | Inauguration of "R & D Headquarter Center"
2011 Certification according to EN ISO 9001:2008
2012 SEPEMO-Monitoring JAZ 7,29 > Direct Evaporating (EU heat pump project) | MCS-Certification
2014 Intelligent heat pump production "transparent production"
2015 PV System Integration
2016 New Sensor Series Introduction
2017 30 years! Scroll technology & "web**ControlAT**®" market introduction

HELIOTHERM
The Heat Pump

Research and Development Center

consisting of

- R & D testing rig
- Continuous load testing rig
- Climate chamber
- Hydraulic testing bench
- Construction
- Special assembled units – Heating & Cooling
- Quality control and safety / ISO 9001

HELIOTHERM
The Heat Pump

Production

- Capacity for up to 7,500 heat pumps per year
- Quality inspection on all heat pumps
- Currently over 39,000 heat pumps installed

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The Heat Pump

Heliotherm Training Academy

Continuous technology and sales training for new and existing Heliotherm Compentence Partners

Partnership

clustermitglied. Tirol

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TOMORROW TODAY

ehpa
european heat pump association

WÄRMEPUMPE AUSTRIA

bwp Bundesverband Wärmepumpe e.V.

Fachvereinigung Wärmepumpen Schweiz FWS

initiative EnergieEffizienz wärmepumpe

klima:aktiv partner

Partner
KlimaHaus CasaClima®

WÄRMEPUMPEN-MARKTPLATZ NRW

Ausstellungspartner der
umwelt arena
Spreitenbach

MCS
BBA
CERTIFICATE BBA 0136

HELIOTHERM
The Heat Pump

Distribution Area

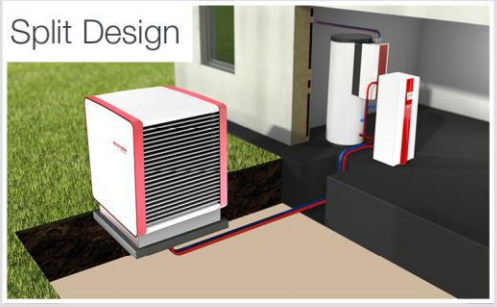
180 Competence partners europe-wide

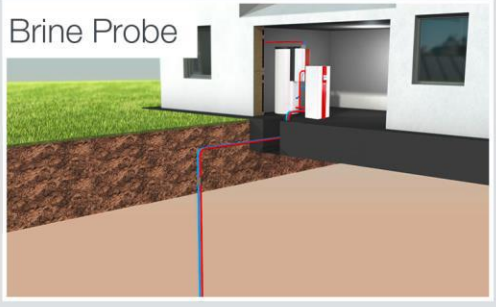
- Austria
- Germany
- Switzerland
- Czech Rep.
- Slovakia
- Netherlands
- Belgium
- Luxembourg
- Great Britain
- Ireland
- Russia
- Hungary
- Spain
- Portugal
- Serbia
- Norway
- Denmark
- Poland
- Bulgaria
- Romania
- Slovenia
- Estoria
- Latvia
- Lithuania
- Ukraine
- Greece

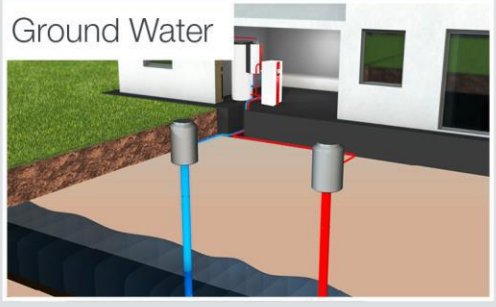
HELIOTHERM
The Heat Pump

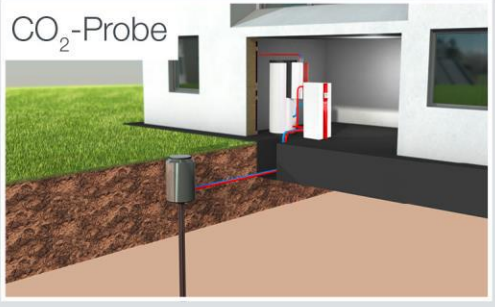
Heat Pump Systems
Ranging from 5 to 250 kW

Heating,
Cooling & DHW









HELIOTHERM
The Heat Pump

Product range overview

Groundwater

Basic Comfort
Stepless Modulation
8 to 25 kW

Web Control
Stepless Modulation
5 to 28 kW

Sensor Solid
Stepless Modulation
30 to 50 kW

Sensor Solid
Stepless Modulation
50 to 120 kW

Brine/Water

Basic Comfort
Stepless Modulation
8 to 20 kW

Web Control
Stepless Modulation
8 to 20 kW

Sensor Solid
Stepless Modulation
25 to 50 kW

Sensor Solid
Stepless Modulation
50 to 100 kW

Direct evaporating

Basic Comfort
Stepless Modulation
8 to 20 kW

Web Control
Stepless Modulation
8 to 20 kW

Natural Technology

Sensor Natural Technology
Stepless Modulation
10 to 15 kW

HELIOTHERM
The Heat Pump

Heliotherm Heat Pumps

Advantages compared to conventional heat pumps

- **Highest performance** (SPF 7,29)
  Direct evaporator; according to AIT-Sepemo results
- **Modulating technology**
- **Electronic refrigerant control** (dsi TECHNIK)
- **twin-x optimum refrigeration cycle**
- **Non additional heating element!** (STOP)

- **Remote Control**
- **CO_2-Natural Technology**
- **Fresh hot water system**
- **Sonic decoupled casing**

Made in Austria

Which requirements must be fulfilled

The premium name brand **Heliotherm** Heat Pump Technology and **“Made in Austria“** presents nationally and internationally an essential quality attribute.

This sustainable differentiation advantage to international providers give domestic home developers the security of obtaining **100% Austrian quality**.

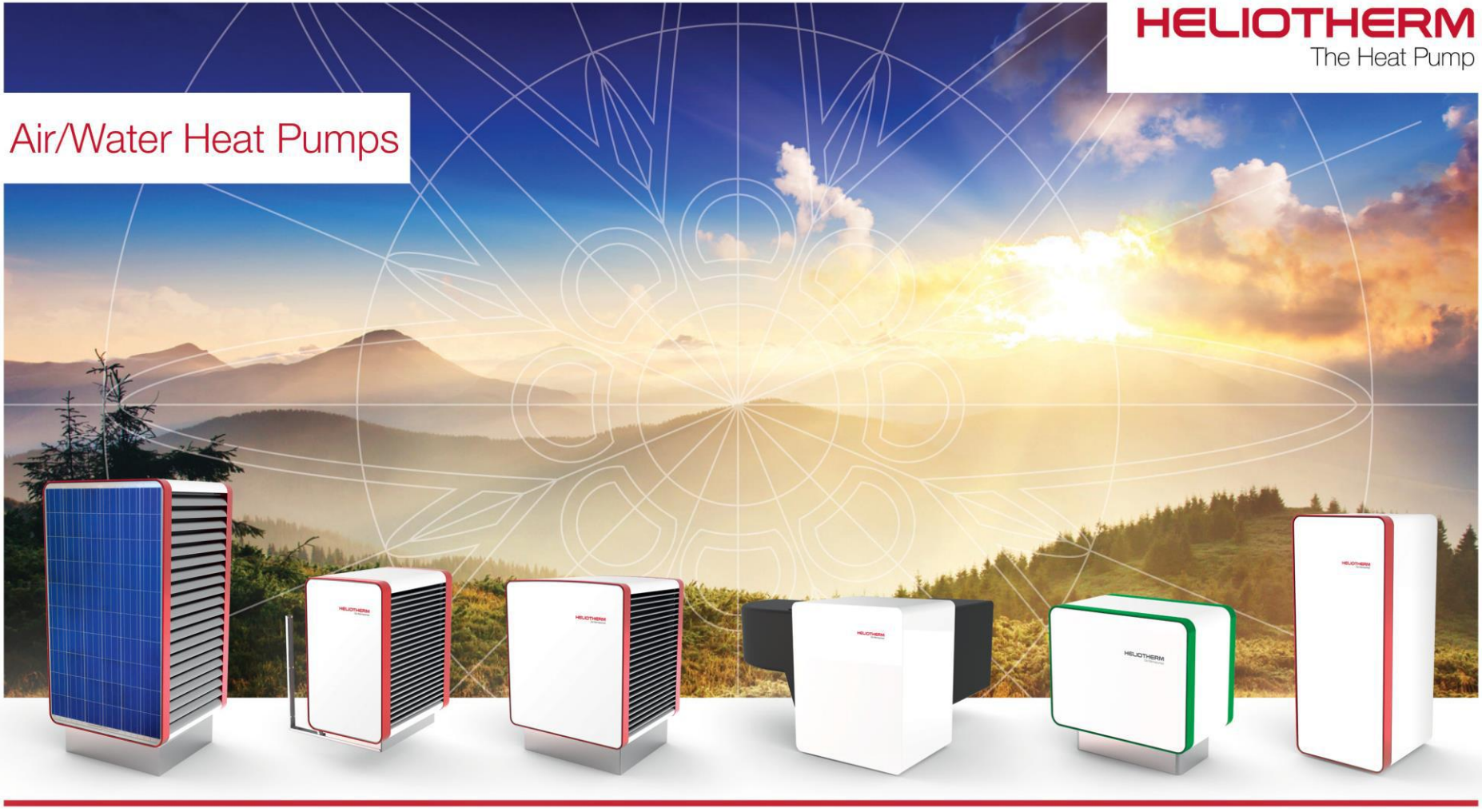
HELIOTHERM
The Heat Pump

Product Range

Heliotherm gives you flexibility

HELIOTHERM
The Heat Pump

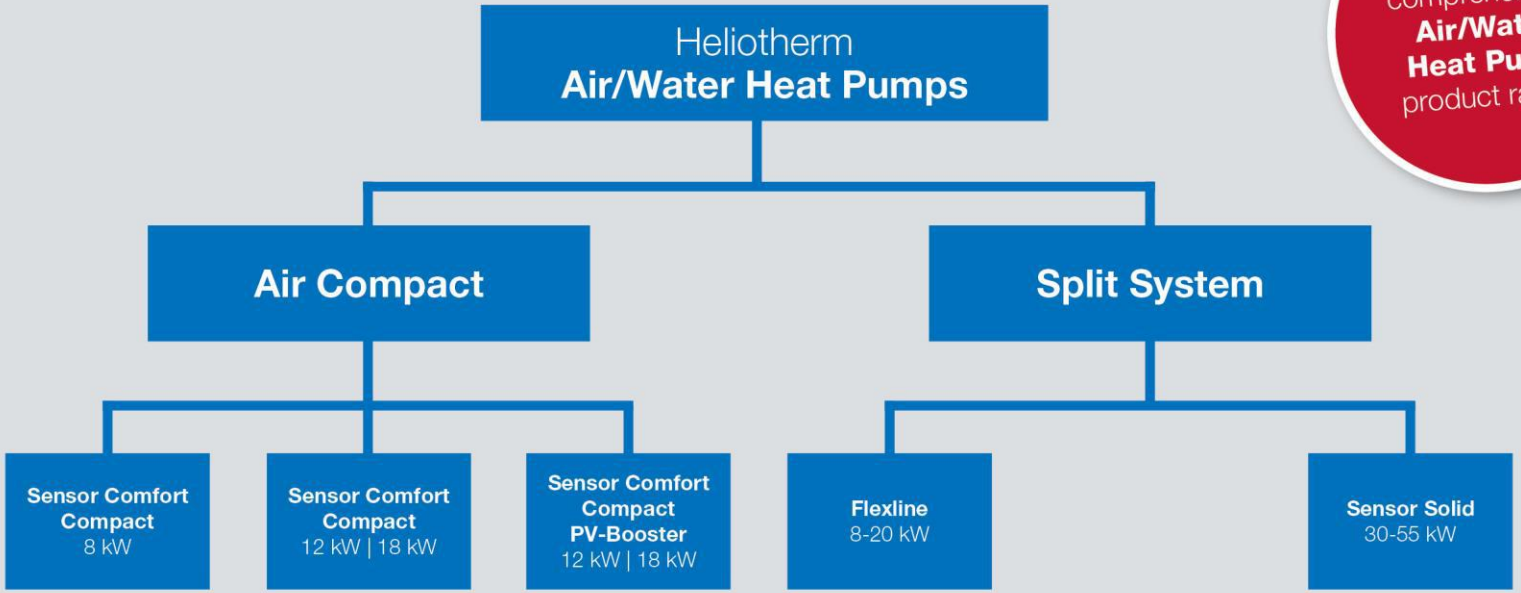
Air/Water Heat Pumps



HELIOTHERM
The Heat Pump

Air / Water
Heat Pump Overview

Most comprehensive **Air/Water Heat Pump** product range

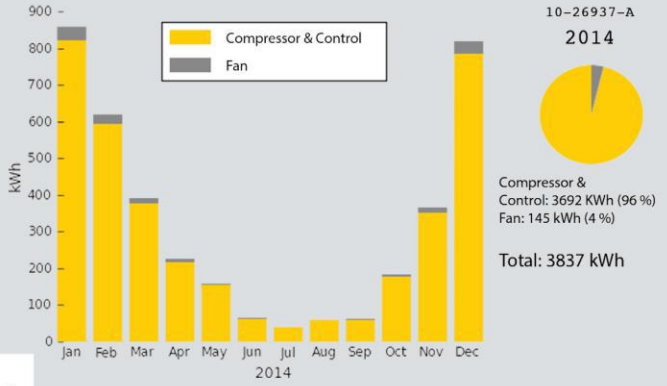


HELIOTHERM
The Heat Pump

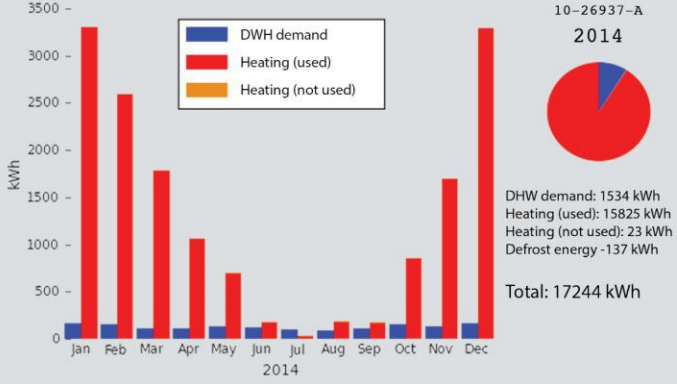
Efficiency in numbers

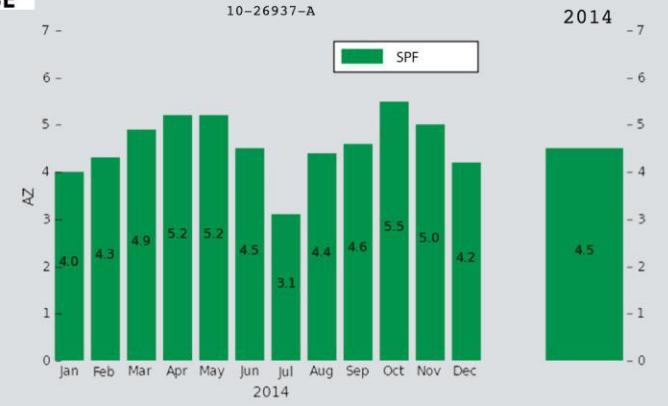
Energy Source **Air**

- Residential home in Stadtland - 185 m²
- HP12L-M-WEB incl. UFH und radiators
- Heating capacity (A2/W35): 12,89 kW (EN14511)



Fraunhofer ISE

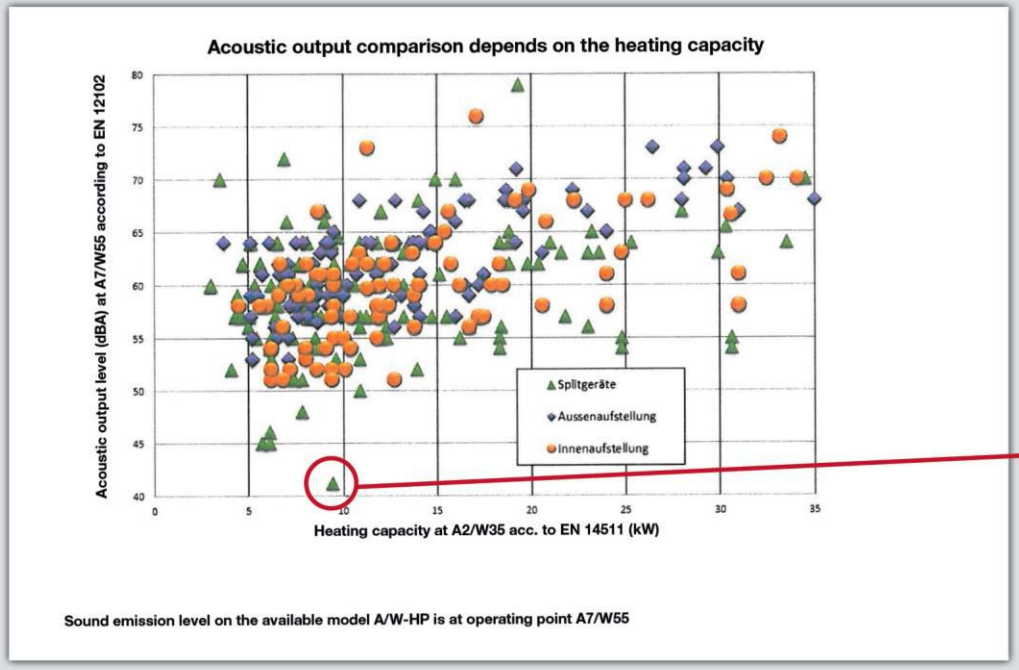




HELIOTHERM
The Heat Pump

Sound emission

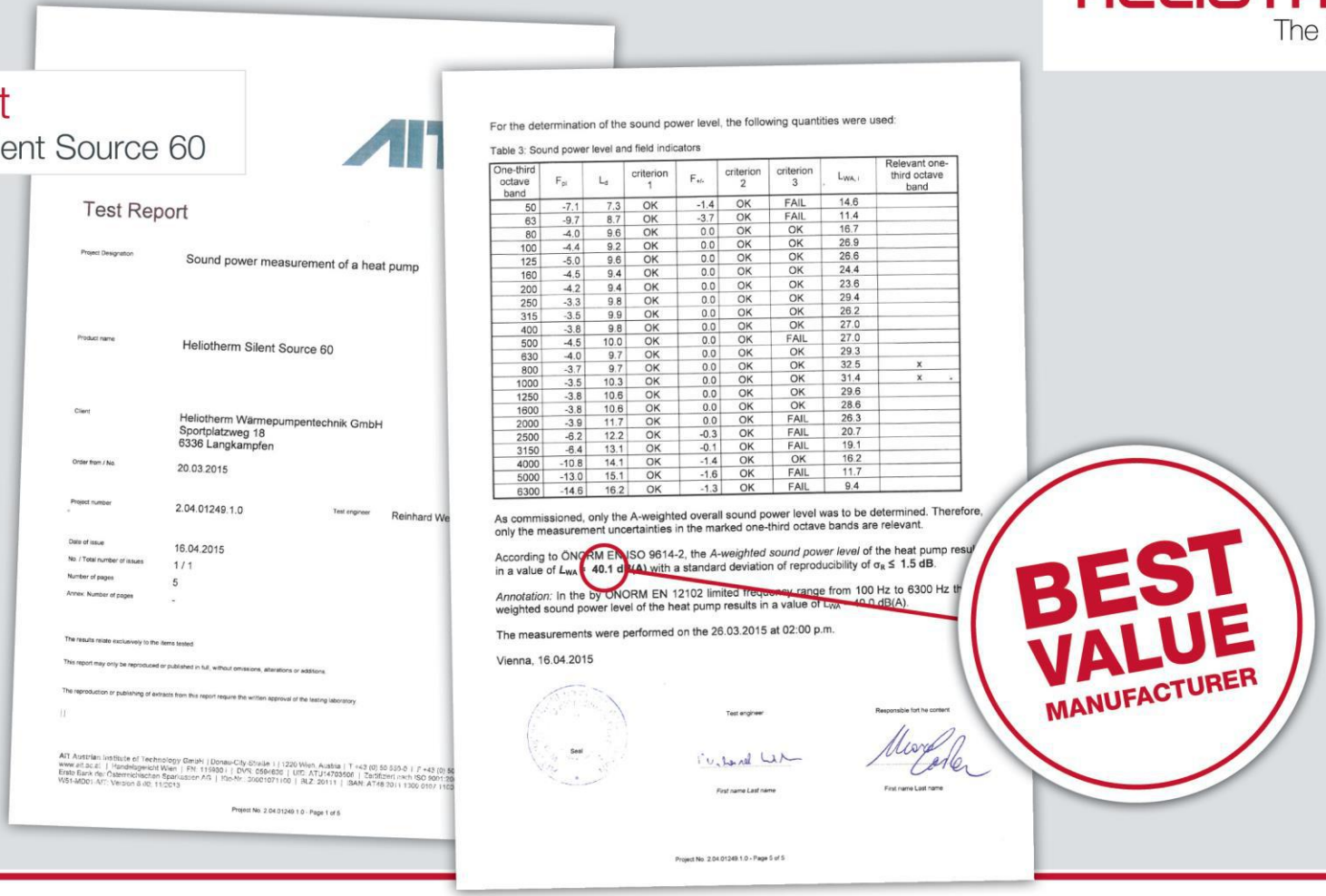
When compared to conventional systems



BEST VALUE MANUFACTURER

HELIOTHERM
The Heat Pump

Test report
Heliotherm Silent Source 60



Test Report

Project Designation: Sound power measurement of a heat pump

Product name: Heliotherm Silent Source 60

Client: Heliotherm Wärmepumpentechnik GmbH
Sportplatzweg 18
6336 Langkampfen

Order from / No.: 20.03.2015

Project number: 2.04.01249.1.0

Test engineer: Reinhard We

Date of issue: 16.04.2015

No. / Total number of issues: 1 / 1

Number of pages: 5

Annex: Number of pages: -

The results relate exclusively to the items tested.

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www.ait.ac.at | Handelsgericht Wien | FN: 115980 | DVR: 0564630 | UID: ATU14703506 | Zertifiziert nach ISO 9001:20
Erste Bank der Österreichischen Sparkassen AG | Kto-Nr.: 30001071100 | BLZ: 20111 | IBAN: AT48 2011 1300 0107 1103
WS14d001.AIT: Version 6.00, 11/2013

Project No. 2.04.01249.1.0 - Page 1 of 5

For the determination of the sound power level, the following quantities were used:

Table 3: Sound power level and field indicators

One-third octave band	F_{pi}	L_d	criterion 1	$F_{+/-}$	criterion 2	criterion 3	$L_{WA,i}$	Relevant one-third octave band
50	-7.1	7.3	OK	-1.4	OK	FAIL	14.6	
63	-9.7	8.7	OK	-3.7	OK	FAIL	11.4	
80	-4.0	9.6	OK	0.0	OK	OK	16.7	
100	-4.4	9.2	OK	0.0	OK	OK	26.9	
125	-5.0	9.6	OK	0.0	OK	OK	26.6	
160	-4.5	9.4	OK	0.0	OK	OK	24.4	
200	-4.2	9.4	OK	0.0	OK	OK	23.6	
250	-3.3	9.8	OK	0.0	OK	OK	29.4	
315	-3.5	9.9	OK	0.0	OK	OK	26.2	
400	-3.8	9.8	OK	0.0	OK	OK	27.0	
500	-4.5	10.0	OK	0.0	OK	FAIL	27.0	
630	-4.0	9.7	OK	0.0	OK	OK	29.3	
800	-3.7	9.7	OK	0.0	OK	OK	32.5	x
1000	-3.5	10.3	OK	0.0	OK	OK	31.4	x
1250	-3.8	10.6	OK	0.0	OK	OK	29.6	
1600	-3.8	10.6	OK	0.0	OK	OK	28.6	
2000	-3.9	11.7	OK	0.0	OK	FAIL	26.3	
2500	-6.2	12.2	OK	-0.3	OK	FAIL	20.7	
3150	-6.4	13.1	OK	-0.1	OK	FAIL	19.1	
4000	-10.8	14.1	OK	-1.4	OK	OK	16.2	
5000	-13.0	15.1	OK	-1.6	OK	FAIL	11.7	
6300	-14.6	16.2	OK	-1.3	OK	FAIL	9.4	

As commissioned, only the A-weighted overall sound power level was to be determined. Therefore, only the measurement uncertainties in the marked one-third octave bands are relevant.

According to ÖNORM EN ISO 9614-2, the *A-weighted sound power level* of the heat pump resu
in a value of L_{WA} = **40.1 dB(A)** with a standard deviation of reproducibility of $\sigma_R \leq$ **1.5 dB**.

Annotation: In the by ÖNORM EN 12102 limited frequency range from 100 Hz to 6300 Hz th
weighted sound power level of the heat pump results in a value of L_{WA} = 40.0 dB(A).

The measurements were performed on the 26.03.2015 at 02:00 p.m.

Vienna, 16.04.2015

Seal

Test engineer

First name Last name

Responsible fort he content

First name Last name

Project No. 2.04.01249.1.0 - Page 5 of 5

BEST VALUE MANUFACTURER

HELIOTHERM
The Heat Pump

Air Compact Heat Pump

8 kW | 12 kW | 18 kW

- Innovative **design**
- High-quality durable materials
- Highly efficient **defrosting process**
- Significant **low noise emission** through acoustic decoupling
- and special insulation
- Minimum operating costs due to a **SCOP of > 4** (at A2/W35 or 5,1 at A7/W35)
- **Energy-optimized operation** of the heat pump (connection to PV)
- **Refrigeration monitoring** > higher operational safety
- **Permanent monitoring** – optimised refrigerant cycle (RPM)
- **Bi-valent operation** (in connection with an existing heat source)
- Integrated **calori meter**

reddot award 2016
winner

HELIOTHERM
The Heat Pump

Air/Water HP Split System – Flexline

reddot award 2016
winner

Sensor Silent Source F
standing **60 | 80 | 120**

reddot award 2016
winner

Sensor Silent Source W
Wallmount **60 | 80**

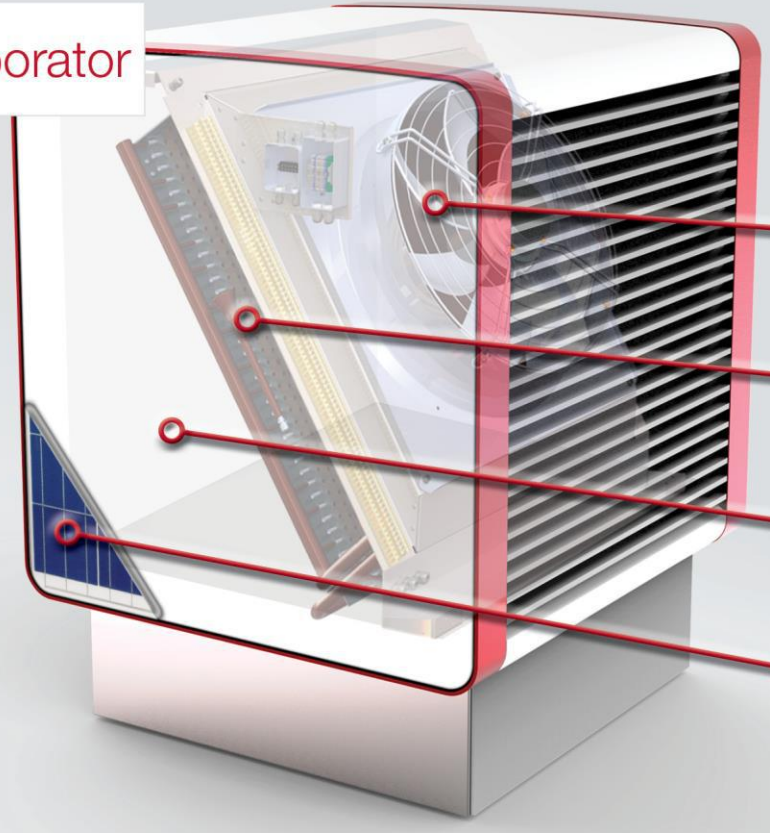
Sensor Silent Source i
Indoor unit **60 | 80**

Basic Comfort Luft
full modulating 8 to 20 kW
(optional active cooling)

Web Control Luft
full modulating 8 to 20 kW
(optional active cooling)

HELIOTHERM
The Heat Pump

Outdoor Evaporator



ECM
Silent fan

Large area / High efficiency evaporator

Tempered glass
UV-resistent

Photovoltaic module

reddot award 2016
winner

HELIOTHERM
The Heat Pump

Outdoor Evaporator - standing unit
8 - 20 kW

- Significant **low noise emission**
- Specially designed axial fan blades - **full modulating**
- Large area evaporator
- The air inlet and outlet openings correspond to the **safety** guideline regulations for **children's playgrounds**
- Case inlets are aerodynamically optimized and **sound reduction design**
- **High-quality durable materials**
  - Tempered glass, aluminum
- Trendsetting design

reddot award 2016
winner

HELIOTHERM
The Heat Pump

Outdoor Evaporator - wall mounted unit

8 - 12 kW

- Building facade mounting installation
- Aesthetic design > various models available
- Large area evaporator
- Specially designed **axial fan blades**
- Significant **low noise emission**
- **Effective** condensate drain
- Trendsetting innovative **design**

reddot award 2016
winner

HELIOTHERM
The Heat Pump

Indoor Air Evaporator - indoor unit

8 - 20 kW

- **Aesthetic design > various models available**
- **Large area** evaporator
- Specially designed **radial fan**
- Significant **low noise emission**
- **Effective** condensate drain
- **Spezieller** Kondensat-Ablauf
- Trendsetting innovative design
- **Flexible** installation options

HELIOTHERM
The Heat Pump

Air/Water Heat Pump

Basic Comfort Fully Modulating 8 kW | 12 kW | 20 kW

- **Compatible** with modern **building management systems** (optional)
- Prepared for connection of a PV system - **own use of electricity**
- Ideal for modernization of heating systems - **easy installation**
- Integrated **high-efficiency pumps A+**
- Safe and virtually **maintenance-free operation** by using innovative scroll compressors
- Outlet temperatures up to 62 ° C possible
- **Permanent Monitoring** – optimised refrigerant cycle (**RPM**)
- **Weather compensated integral control** with DHW and Processcontrol
- Integrated **calori meter**
- **High efficiency** through innovative modulation technology

HELIOTHERM
The Heat Pump

Air/Water Heat Pump

Web Control Fully Modulating 8 - 20 kW

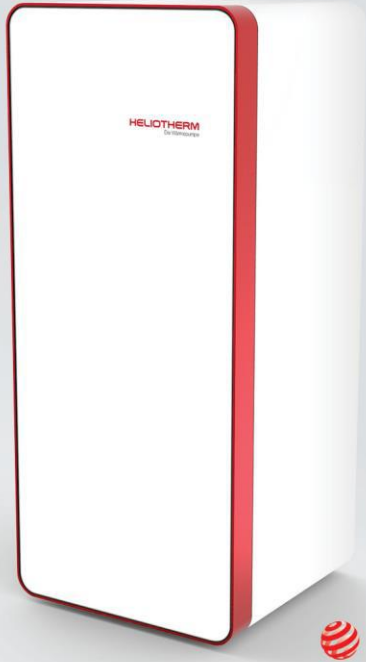
- **Highest energy efficiency** of all air heat pumps available on the market in its class > **highest possible subsidies**
- **Quiet operation through acoustic decoupling and** special insulation design (DSC).
- Integrated **high-efficiency pumps A+**
- Patented dsi-technology® and registered twin-x technology® > highest efficient use of free environmental energy
- **Permanent monitoring** – optimized refrigerant cycle (**RPM**)

HELIOTHERM
The Heat Pump

Air/Water Heat Pump

Sensor Solid - 30 kW | 40 kW | 55 kW

- **mit Sensor RCU**
- Patended **dsi-Technology®** and registered **twin-x® Technology**
  > More use of free energy
- Very quiet operation
- Permanent Monitoring **(RPM)**
- **Combination possibilities with modern building technology**



HELIOTHERM
The Heat Pump

Outdoor Evaporator - standing unit

30 kW | 40 kW | 55 kW

- Significant **low noise emission**
- Specially designed **axial fan blades- fully modulating**
- **Large area** evaporator
- The air inlet and outlet openings correspond to the **safety guideline** regulations for **children's playgrounds**
- Engineered case design keeps the air flow aerodynamically optimized
- **High-quality** durable **materials** - tempered glass - anodized aluminium
- **Trendsetting innovative design**

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The Heat Pump

Showcase Installation

powered by GEO SOLAR

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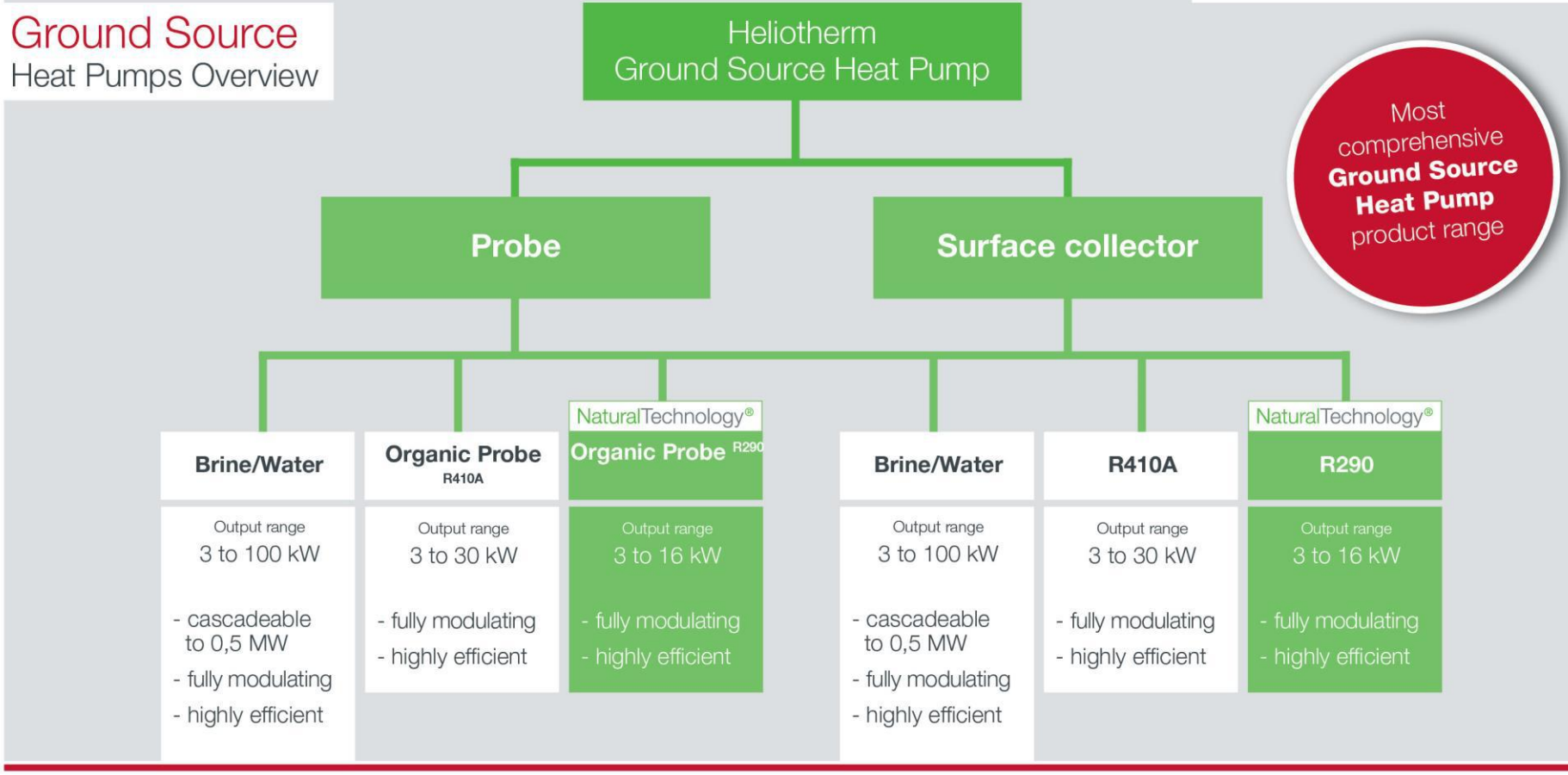
The Heat Pump

Ground/Water Heat Pump

HELIOTHERM
The Heat Pump

Ground Source
Heat Pumps Overview

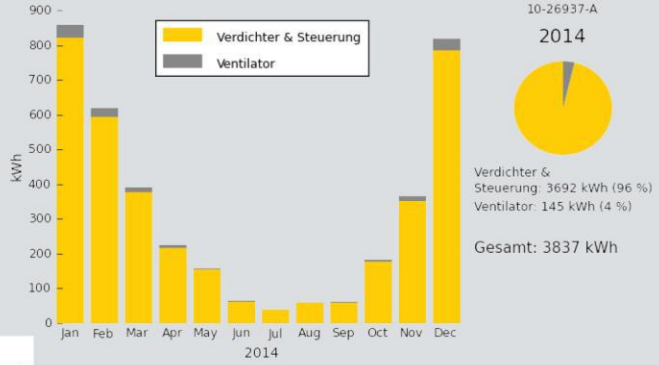


HELIOTHERM
The Heat Pump

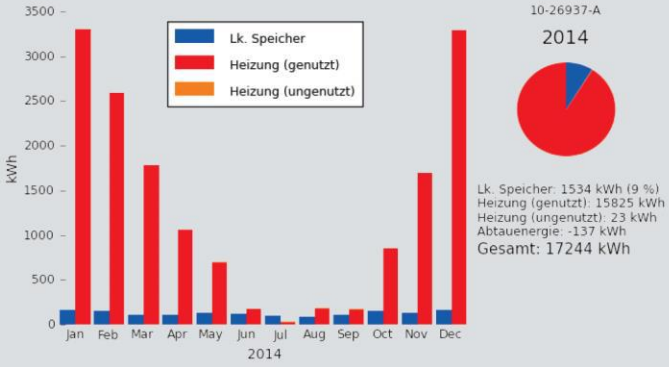
Efficiency in numbers

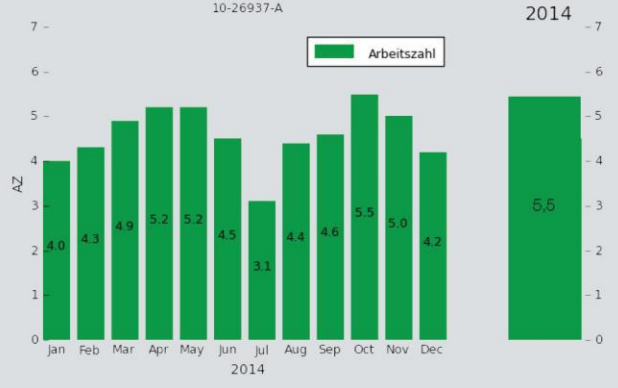
Energy Source **Ground**

- Residential complex building in Zankenhausen - 185 m²
- HP12E-M-WEB incl. UFH und radiators
- Heating capacity (E4/W35): 12,89 kW (EN14511)



Fraunhofer ISE





HELIOTHERM
The Heat Pump

Water/Water & Brine/Water Heat Pump

HELIOTHERM
The Heat Pump

Brine/Water & Water/Water Heat Pump

Basic Comfort Fully Modulating - 8 to 20 kW

- **High efficiency** / attractive price performance ratio
- The **compact design** requires a small space footprint in the heating room
- **Less installation costs** through integrated hydraulic block
  (high efficiency for brine and heating cycle, switch valve for DHW and flex assembly tubes for quiet operation)
- **Very quiet operation** > acoustic decoupling case design und insulation (DSC)
- No heating rod-zone **> no hidden costs**
- Compatible with modern building management systems (optional)

HELIOTHERM
The Heat Pump

Brine/Water & Water/Water Heat Pump

Web Control Fully Modulating - 8 to 20 kW

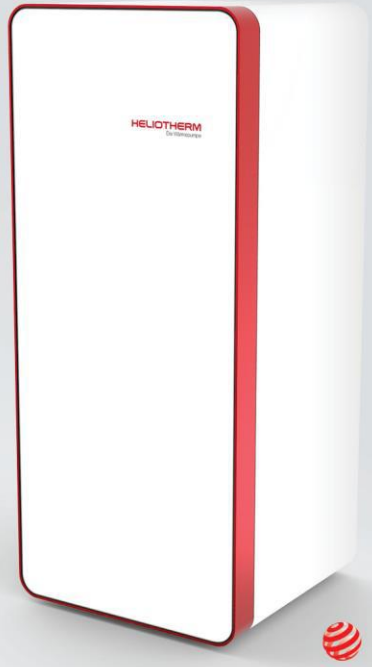
- **High efficiency** / attractive price performance ratio
- Requires less space > small space footprint in the heating room
- **Less installation costs** through integrated hydraulic block (high efficiency for brine and heating cycle, switch valve for DHW and flex assembly tubes for quiet operation)
- **Very quiet operation** > acoustic decoupling case design und insulation (DSC)
- No heating rod-zone > **no hidden costs**
- **Compatible** with modern building management systems (optional)
- Titanium welded spiral heat exchanger or fusion heat exchanger (optional)

HELIOTHERM
The Heat Pump

Brine/Water & Water/Water Heat Pump

Sensor Solid - 30 kW | 60 kW | 120 kW

- Capacity range from 20 to 120 kW
  > optimum energy supply in
  buildings with higher temperature requirements
- **Minimum operating costs** > COP values over 5.0 > (B0/W35)
- **Safe and virtually maintenance-free operation** by using innovative scroll compressors
- **Quiet and low vibration** during operation > Sound optimized > device construction
- User-friendly and innovative Remote Control for weather based data operation
- **Increased cost savings** and **efficiency** through optional connection to a photovoltaic system
- **Fusion heat exchanger (optional)**



Test bench results

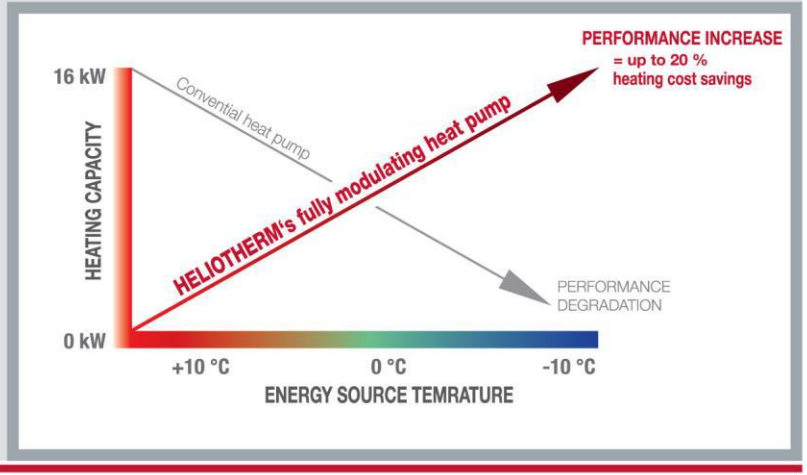
AIT

- Brine B0/W35 = **5,04**
- Water/Water B10/W35 = **6,3**
- **5 K** Temperature difference

HELIOTHERM
The Heat Pump

Stepless Modulation

- Increased heat output with decreasing outdoor temperatures
- Higher efficiency and up to **20% less energy costs** compared to conventional heat pumps
- **Increased lifetime** due to soft starter phase > lower sound emission
- **Less power consumption** due to modulating peripherals > cost saving
- **Extreme quiet compressor operation** and outdoor air evaporator (for air heat pump) through speed control
- Regulated performance control detects an external heat source (e.g.: stove oven), thus reducing the heat pump performance, resulting in lower operating costs
- **100% adjustment** of the building's heating load through stepless modulation



HELIOTHERM
The Heat Pump

Advantages over competitors

Heliotherm has the best proven heat pump on the market

- Out of 187 surveyed installations, Heliotherm has the **most proven ground coupled** and **air/water heat pump performance** compared to the conventional heat pump competitors.
- From **1997 to 2016** Heliotherm has steadfast set significant milestones achieving **highest testing rig efficiency results for the ground source heat pump** (COP 5.7 at E4W35, former Excel Series, prior to Web Control heat pump series) > **no other company has reached these recorded values!**

reddot award 2016
winner

BEST VALUE MANUFACTURER

HELIOTHERM
The Heat Pump

Ground Source Direct System Heat Pump

NaturalTechnology®

HELIOTHERM
The Heat Pump

Natural Technology®
Surface Collector Direct System

reddot award 2016
winner

- **Heating capacity** 2 to 10 kW | 4 to 15 kW
- Natural refrigerant
- **Outdoor installation**
- **High SPF**
- Recommended by environmental organizations
- Exceeds EU regulation F-GAS N517 / 2014 for **reduction of greenhouse gases**
- **Enhances** the property value
- **Increases the heat pump system total efficiency**

HELIOTHERM
The Heat Pump

Natural Technology®
Surface Collector Direct System

reddot award 2016
winner

- No glycols - **Water legislation is unobjectionable**
- Up to 25% more efficient than conventional systems
- **Fully modulating version**
- **Approval in water protection areas possible**
- Patented technology
- **Best price / performance ratio**

Test Report **AIT**

Page 1 | July 6, 2016

AIT AUSTRIAN INSTITUTE OF TECHNOLOGY

Prüfbericht/*Test Report*

Bezeichnung des Projektes
Project Designation

Typenprüfung einer erdgekoppelten
Direktübertragungs-Wärmepumpe
Heliotherm SNMT3-10
laut dem EHPA Prüfreglement

Test of a direct exchange ground
coupled/Water heat pump
Heliotherm SNMT3-10
according to EHPA testing regulation

Auftraggeber
Client

Heliotherm
Wärmepumpentechnik Ges.m.b.H
z.H.: Herr Fuchs
Sportplatzweg 18 .
A-6336 Langkampfen

Auftrag vom / Zahl
Order from / No. 01.2016

Projekt Nr.
Project No. 2.04.01327.1.0

Sachbearbeiter
Test Engineer Ing. Andreas Kotal

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HELIOTHERM
The Heat Pump

Test Report **AIT**

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Untersuchungsergebnisse
Results of the testing

An der Wärmepumpe SNTM3-10 der Firma Heliotherm war am Prüfstand der AIT Austrian Institute of Technology GmbH eine Typenprüfung gemäß EN 15879-1, EN 14825 und dem EHPA - Prüfreglement durchzuführen.

Test of the heat pump SNTM3-10, a product of Heliotherm, was carried out at the test rig of the AIT Austrian Institute of Technology GmbH according to the EN15879-1, EN14825 and the EHPA testing regulations.

	Mittlere Heizleistung *average heating capacity* [kW]	mittlere Leistungs-aufnahme *average power input* [kW]	**Leistungs-zahl** ***coefficient of performance*** [-]	Unsicherheit Heizleistung *uncertainty – heating capacity* [± kW]	Temperatur Anwendung *temperature application*	Referenz-heizperiode *heating season*	Prüfpunkt *test condition*
E-1W35 5K	4.05	0.76	**5.35**	0.057	a)	a)	a)
E4W35 5K	5.53	0.90	**6.15**	0.079	b)	b)	b)
E4W35 5K	10.69	2.10	**5.10**	0.155	-	-	-
E4W35 5K	10.69	2.10	**5.10**	0.155	niedrig *low*	w (wärmer) *w (warmer)*	B
E4W35 5K	10.69	2.10	**5.10**	0.155	niedrig *low*	c (kälter) *c (colder)*	E
E4W30 5K	6.73	1.03	**6.52**	0.095	niedrig *low*	c (kälter) *c (colder)*	A
E4W34 5K	9.83	1.82	**5.40**	0.141	niedrig *low*	a (mittel) *a (average)*	A
E4W30 5K	5.72	0.86	**6.66**	0.081	niedrig *low*	a (mittel) *a (average)*	B
E4W27 5K	3.82	0.48	**7.90**	0.055	niedrig *low*	a (mittel) *a (average)*	C
E4W24 5K	3.83	0.48	**8.00**	0.055	niedrig *low*	a (mittel) *a (average)*	D

COP
6,2

HELIOTHERM
The Heat Pump

Test Report **AIT**

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E4W55 8K	5.84	1.93	**3.02**	0.053	-	-	-
E4W52 8K	5.27	1.61	**3.27**	0.048	hoch *high*	a (mittel) *a (average)*	A
E4W42 8K	3.07	0.69	**4.47**	0.027	hoch *high*	a (mittel) *a (average)*	B
E4W70 10K	5.92	2.53	**2.34**	0.043	c)	c)	c)

a) COP bei E-1W35 mit WNA ΔT= 5 K gemessen/ *COP determined at E-1W35 with ΔT = 5 K*
b) COP bei E4W35 mit WNA ΔT= 5 K gemessen/ *COP determined at E4W35 with ΔT = 5 K*
c) COP bei E4W70 mit WNA ΔT= 10 K gemessen/ *COP determined at E4W70 with ΔT =10 K*

Temperaturanwendung *temperature application*	Referenz-heizperiode *heating season*	**Saisonale Leistungszahl** ***Seasonal coefficient of performance***
niedrig *low*	a (mittel) *a (average)*	**6.67**

Wien/*Vienna*, 06.07.2016

Austrian Institute of Technology GmbH BMWFJ akkreditiertes Prüflabor

Rundsiegel/*Seal*

Sachbearbeiter
Test Engineer

Ing. Andreas Kotal

Zeichnungsberechtigter
Responsible for the content

Ing. Christian Köfinger, MSc

Projekt Nr./*Project No.* 2.04.01327.1.0

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SCOP 6,7

HELIOTHERM
The Heat Pump

Maximal heat outlet temperature

Natural Technology DX

E4W55 8K	5.84	1.93	**3.02**	0.053	-	-	-
E4W52 8K	5.27	1.61	**3.27**	0.048	hoch *high*	a (mittel) *a (average)*	A
E4W42 8K	3.07	0.69	**4.47**	0.027	hoch *high*	a (mittel) *a (average)*	B
E4W70 10K	5.92	2.53	**2.34**	0.043	c)	c)	c)

[a] COP bei E-1W35 mit WNA ΔT= 5 K gemessen/ *COP determined at E-1W35 with ΔT = 5 K*
[b] COP bei E4W35 mit WNA ΔT= 5 K gemessen/ *COP determined at E4W35 with ΔT = 5 K*
[c] COP bei E4W70 mit WNA ΔT= 10 K gemessen/ *COP determined at E4W70 with ΔT =10 K*

Temperaturanwendung *temperature application*	Referenzheizperiode *heating season*	**Saisonale Leistungszahl** ***Seasonal coefficient of performance***
niedrig *low*	a (mittel) *a (average)*	**6.67**

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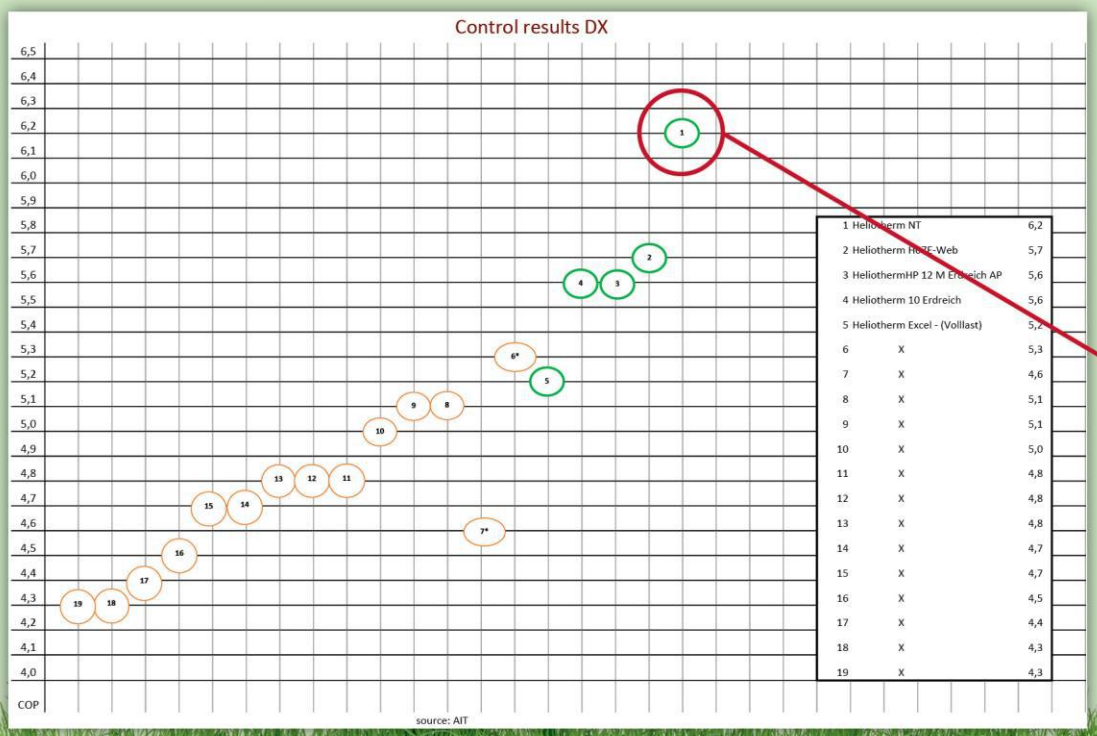
Max. Heat.
Outlet Temperature
70 °C

HELIOTHERM
The Heat Pump

Highest Efficiency
Natural Technology DX



1	Heliotherm NT	6,2
2	Heliotherm HERF-Web	5,7
3	HeliothermHP 12 M Erdreich AP	5,6
4	Heliotherm 10 Erdreich	5,6
5	Heliotherm Excel - (Volllast)	5,2
6	X	5,3
7	X	4,6
8	X	5,1
9	X	5,1
10	X	5,0
11	X	4,8
12	X	4,8
13	X	4,8
14	X	4,7
15	X	4,7
16	X	4,5
17	X	4,4
18	X	4,3
19	X	4,3

Heliotherm
Natural Technology
BEST VALUE

HELIOTHERM
The Heat Pump

PV COP-Booster | Independence Package

HELIOTHERM
The Heat Pump

Heliotherm photovoltaic integration

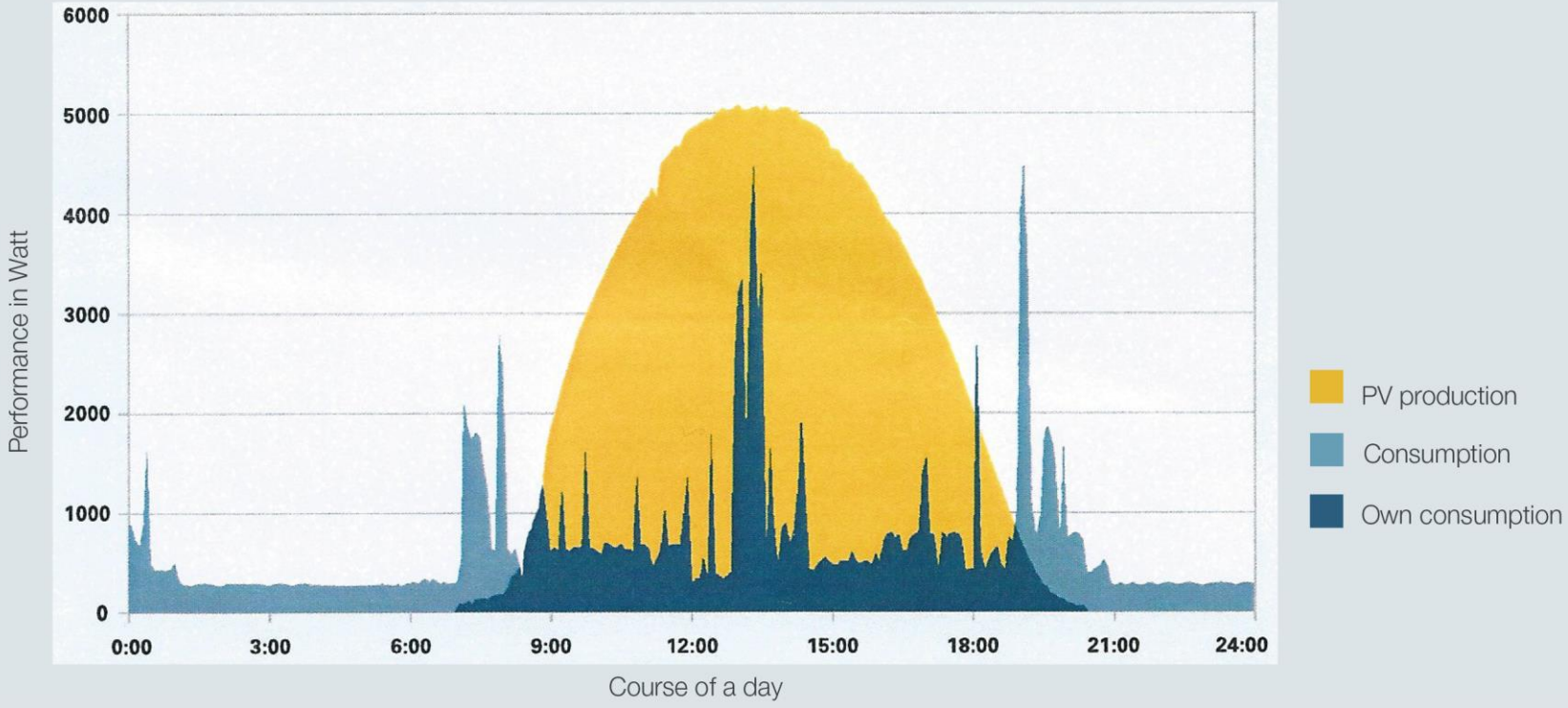
The smart combination of a Heliotherm heat pump and a photovoltaic system offers sustainable environmental and economic benefits

- Independence to fossil fuels
- Not reliant on electricity supply companies and increasing electricity prices
- Significant reduction of annual heating costs
- Increased building- property value by installation of high efficiency heating system > Energy efficiency class
- Improved Pv own produced electricity and use with intelligent control
- Easy to upgrade

HELIOTHERM
The Heat Pump

Efficient solar power self-consumption

Example of a typical course of a sunny day (4 person household)



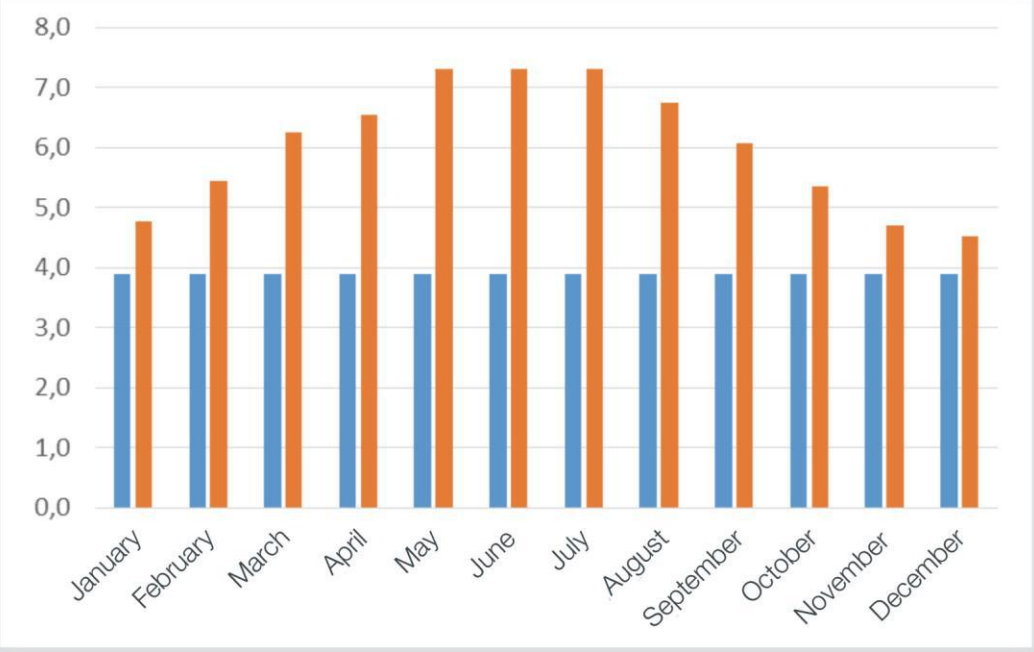
HELIOTHERM
The Heat Pump

PV COP-Booster

- **Sincreased efficiency** for domestic hot water and heating
- **Modular expansion** possible
- **Plug and function -** no assembly required
- Integrated PV modules on engineered case surface
- **High-quality materials**
- Heat pump type Air/Water Compact Design
  8 kW | 12 kW | 18 kW
  PV capacity 2 x 220 W
- Split outdoor air evaporator
  80 | 120
  PV capacity 2 x 110 W

HELIOTHERM
The Heat Pump

Product Range - Ground



SCOP Standard = 3,90

SCOP Booster = 6,03

SCOP a standard heat pump

SCOP the PV COP-Booster

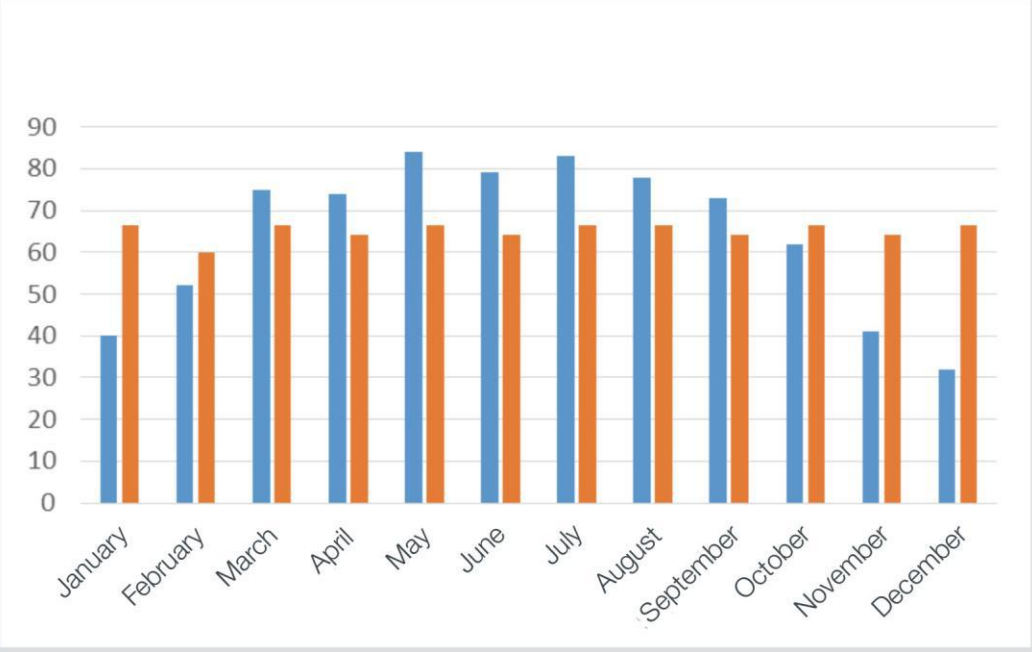
HELIOTHERM
The Heat Pump

Independence Package

- **Improving efficiency**
  - Domestic hot water
  - Heating operation
  - Cooling
- **Modulare expansion** at any time
- **High-quality materials**
- **Optimized power consumption**

HELIOTHERM
The Heat Pump

Independence Package 1



From March to October results in a 100% self-sufficiency combining the heat pump and photovoltaic systems.

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Live Refences

PV Connection

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The Heat Pump

Remote Control Gateway - RCG X

Existing Product Range

- **Connection to building control** (KNX IP / Modbus TCP)
- Optimizes use of **own PV electricity**
- Calculation of PV power over **weather data**
- Data history (recording over 3 years)
- Reports sent by E-mail,
  All heat pump parameters
- **Online Support, Automatic Statistics Report**
- **Direct download of trend data, online update possible**
- **Plug & Function**, no router configuration needed

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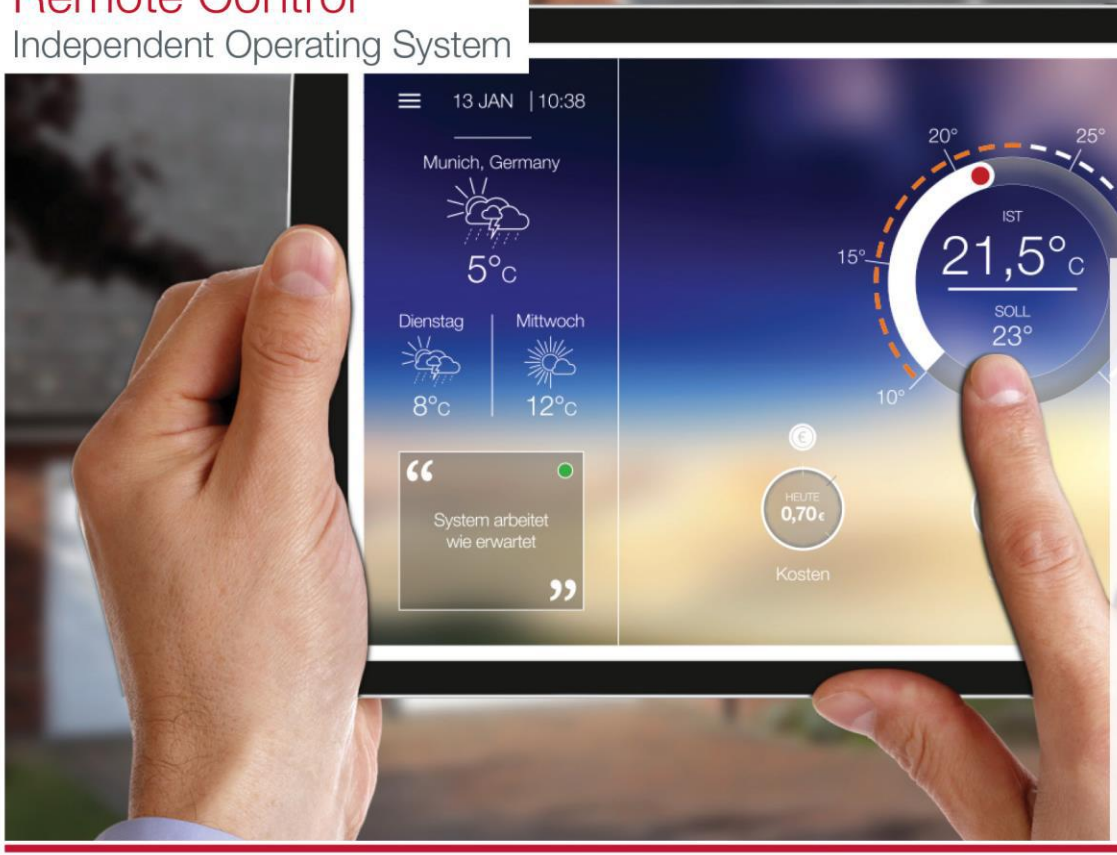
The Heat Pump

Remote Control

Independent Operating System



- Connection to the building's regulating control system
- Connection photovoltaic (SG ready label)
- PV power calculation with weather data
- Data history with over 3 years recording period
- Setting of all heat pump parameters
- Notification messages via e-mail and online support
- Automatic statistics report
- Trend data direct download
- **Online Update**
- **Plug & Function**

HELIOTHERM
The Heat Pump

Remote Control

Heating

Domestic hot water

Cooling

Smart Grid

Photovoltaic

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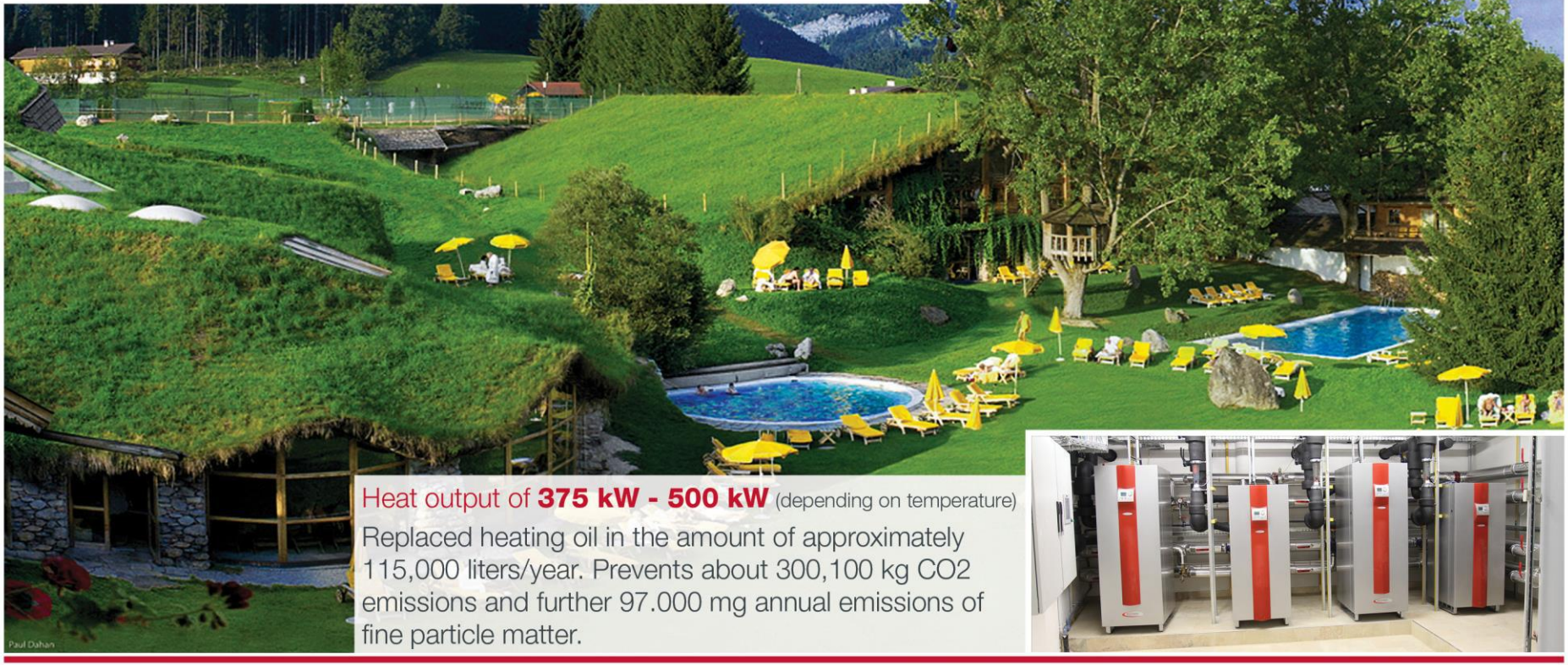
Extension Upgrade Wellness Organic-Hotel Stanglwirt | Tirol

Wellness area and thermal baths extension upgrade



Heat output of **375 kW - 500 kW** (depending on temperature)

Replaced heating oil in the amount of approximately 115,000 liters/year. Prevents about 300,100 kg CO2 emissions and further 97.000 mg annual emissions of fine particle matter.

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The Heat Pump

Extension Upgrade

Congress Alpach | Austria

Heating capacity of **35 - 300 KW**

Total capacity 300 kW modulating
3 x 100 kW cascade
Total cooling capacity 210 kW modulating
3 x 70 kW cascade
Total bore holes: 28 holes;
total tube length 3,920 m
Max. flow energy source side 25.800 l / h
Max. flow on the heating side 15,500 l / h

HELIOTHERM
The Heat Pump

Industrial Refurbishing

Co. Kathrein | Niederndorf | Tyrol

Oil heating was replace with **Heliotherm heat pumps.**

€ 12,000, in heating costs were already saved in the first winter.

The **heat pumps replaced approx. 40,000 liters of heating oiland** thus make a significant contribution in protecting our environment.

HELIOTHERM
The Heat Pump

Sanierung residential building in Leipzig | Germany

Renovation under Energy Saving Ordinance -30 %

3 Heliotherm brine heat pumps
2 x HP28S40W-WEB 1 x HP16S18W-WEB
Heated living area: 27 residential units
with 1800 m² UFH system;
Domestic hot water: 2.000 L buffer storage

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Commercial Heating and Cooling

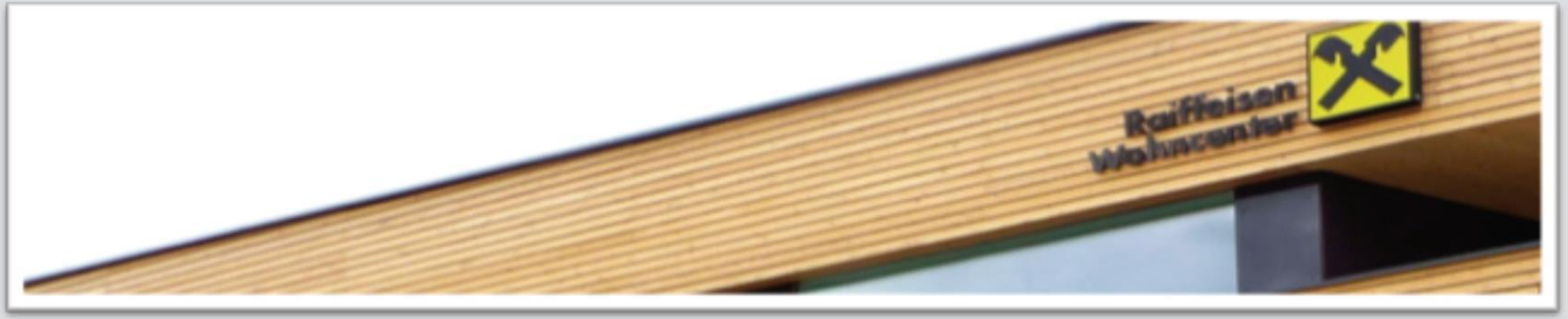
New Building Mc Donalds Villach | Austria

Built::	October 2009
Energy concept:	4 Ground water heat pumps • with active and natural cooling • low temperature climatized heating
Total energy covered: 500.000 kwh	
Heat pump:	**Heliotherm HP42S55W-WEB** with internet connection & monitoring
DHW:	1000 L Fresh water system
CO2 savings:	**75.000 kg/year**

HELIOTHERM
The Heat Pump

Raiffeisen Living Center

Heating and cooling with geothermal energy



The **Raiffeisen Bank Wohncenter** is equiped the **most efficient heat pump technology on the market**. The heating and cooling of the building is rendered by a modulating groundwater heat pump. Thus achieving **higher efficiencies**. In order to visualize the actual COP‘s a calibrated calorimeter and an electricity meter has been installed. In the first three months an average **6 SPF** was achieved.

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The Heat Pump

New Construction Residantal Homes in Münster | Tirol

Heat pump and room ventilation systems

Year built	Autumn 2008
Living Area	143 m² underfloor heating
Heat Pump:	Heliotherm HP07S08W-WEB
Groundwater:	1 well > 14 m depth
Hot water:	fresh hot water system 510 L
Heating price per year:	**300 € incl. Water Heating**

HELIOTHERM
The Heat Pump

New Building Bensheim | Germany

Heat pump system, Monitored by Techn. University Darmstadt

Heated living area:	296 m² UFH
Heat pump:	HP12E-M-WEB - fully modulating with CO_2-probe
Measured data:	01.05.2011 - 30.04.2012
Energie output:	18.091 kWh (heat)
CO2-savings:	4.300 kg/year
Occupants:	5
SCOP:	6,3

Annual heating costs = **€ 585,-**

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Refurbished Arnreit | Austia
Heating system change

Before refurbishment:
Heating with heat pump ground collector (DE)
350 m² of heated area with radiators.
Annual costs for heating and hot water
(29.000 kWh of electricity > heat pump).
Before refurbishment: € 3.480 **= € 9,94 / m²**

After refurbishment:
2 heat pumps 7 & 10 kW mit CO_2-probe,
heat an area of 350 m² with UFH and wall heating.
Annual costs for heating and hot water
(7.260 kWh of electricity > heat pump)
After refurbishment: € 871 **= € 2,49 / m²**

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The Heat Pump

Peak Efficiencies Sepemo Projekt

SEasonal PErformance factor and MOnitoring for heat pump systems

BEST VALUE MANUFACTURER

Single family home residence Nebelberg (in Upper Austria 2002)

The residence is located in Nebelberg, Upper Austria
The heated area is 200 m^2,
the specific heat demand is 48 W/m^2

Measured results from (May 2011 to April 2012):

During the observed period, the heat pump reached a remarkable high performance of.

> SPF 7,29 (average)

HELIOTHERM
The Heat Pump

Advantages
with Heliothrm Technology

- **Highest efficiency**
- **Fully modulating** scroll compressors
- Highest performance value – SCOP
- Simple photovoltaic integration for **"Self generated domestic power"**
- Operation of the system via smart devices
- Remote monitoring and optimization in case of failure
- **Minimal noise emissions** (very quiet)
- **Trendsetting innovative design**
- Surface case customized design (optional)

HELIOTHERM
The Heat Pump

More Advantages
with Heliotherm Technology

- Heat pump specialist with **over 30 years of field experience**
- **Broad product portfolio** - the right solutions for your needs
- **Innovative products** - clear USP‘s
- **Unique Stepless Modulation** - optimal heating capacity adjustment to the building’s heating requirements
- Remote maintenance - rapid response times and cost savings
- **Competence Partner System** – trained professional exclusive installers

HELIOTHERM
The Heat Pump

Thank you for your kind attention