



Introducing VARIOTHERM

Central Heating New Zealand

VARIOTHERM

Central Heating
NEW ZEALAND

- Est 2002
- NZ's leading warm water heating supplier
- Family business, partnered with Rinnai



Our Purpose

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Central Heating
NEW ZEALAND

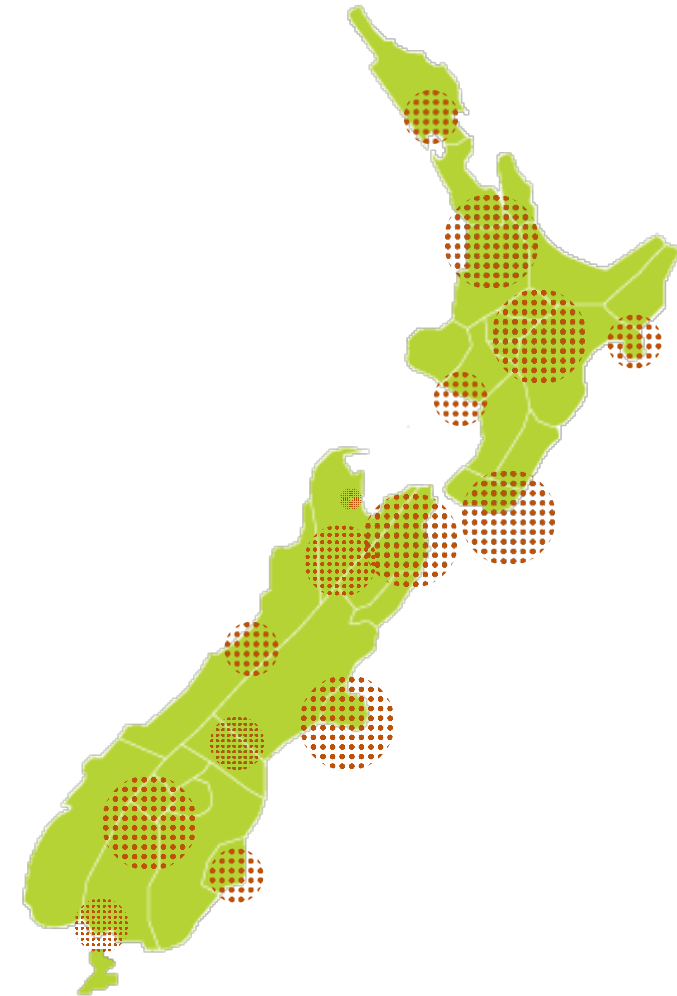


Background

VARIOTHERM

Central Heating
NEW ZEALAND

- 10,000+ residential projects
- 1000+ commercial projects
- Specialist design & collaboration with Specifiers
- Dedicated customer care and after sales
- Industry Training
- Christchurch Install R & D



Strong Supplier Relationships

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Heat Generators

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Emitters – Underfloor Heating

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Emitters - Radiators

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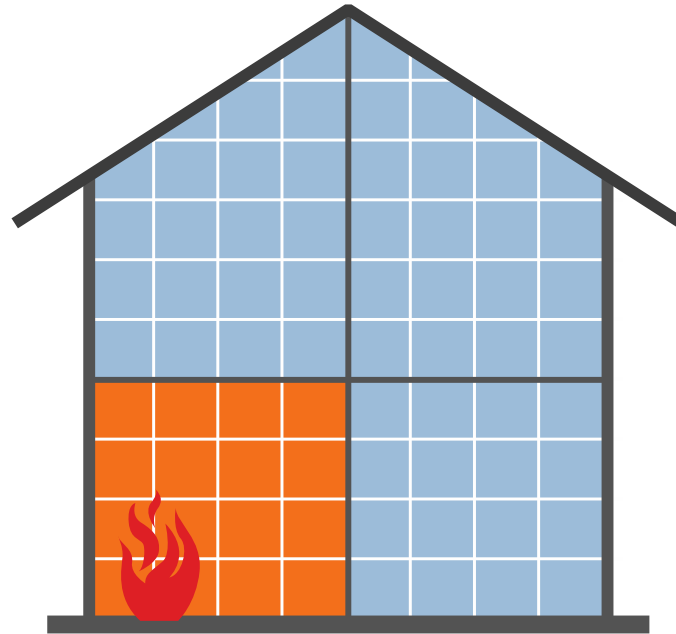
Central Heating
NEW ZEALAND



The Kiwi Way

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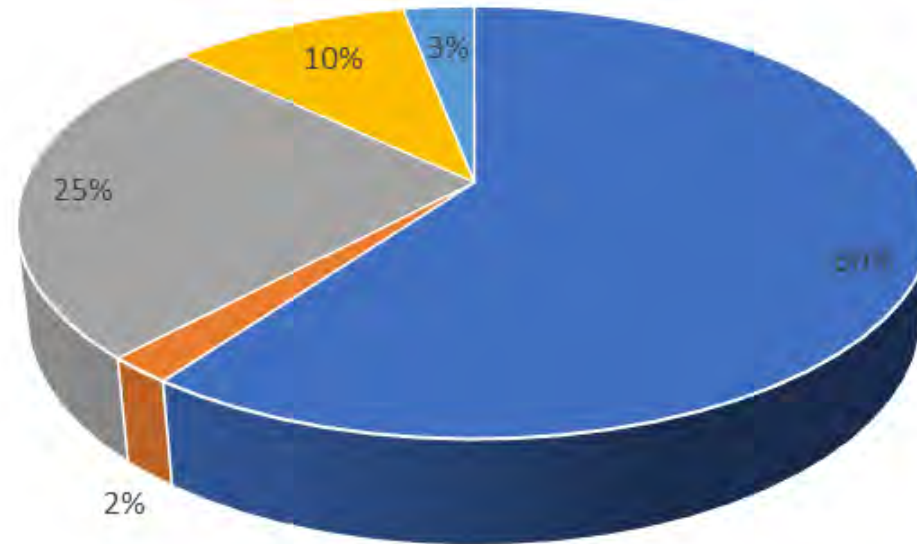
Single heating appliance



The Kiwi Numbers

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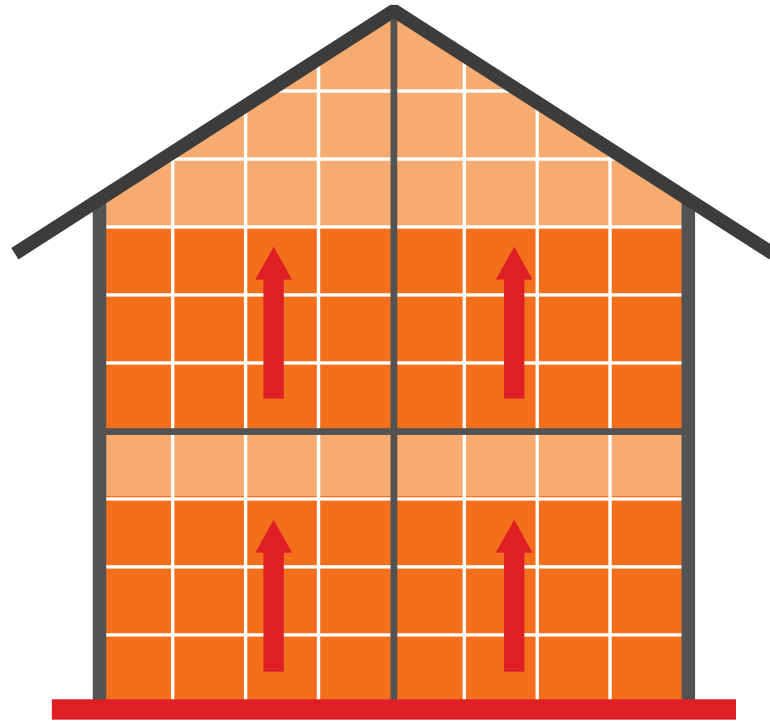
■ Air Heat Pumps ■ Hydronic Systems ■ Log Fires ■ Gas Fires ■ Other



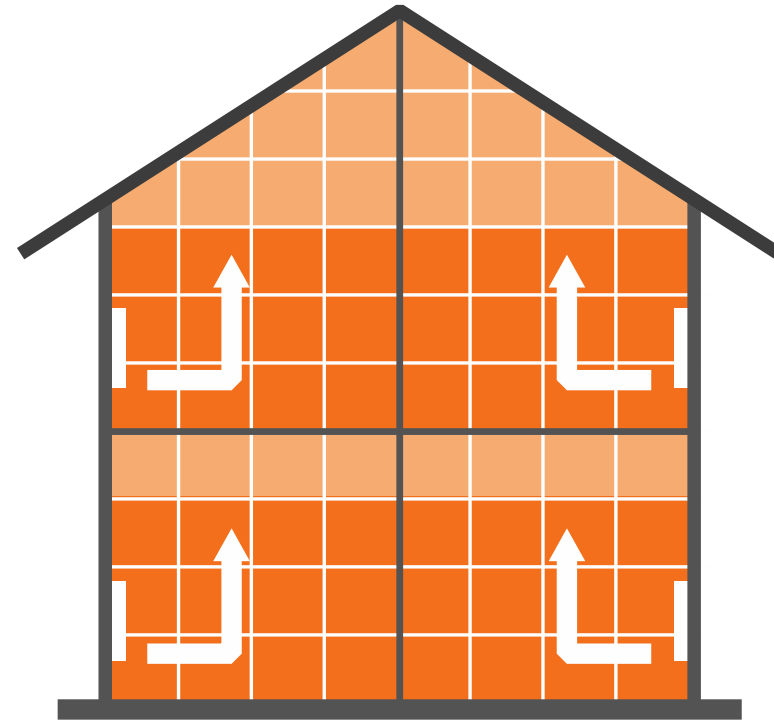
Warm water central heating difference

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Underfloor

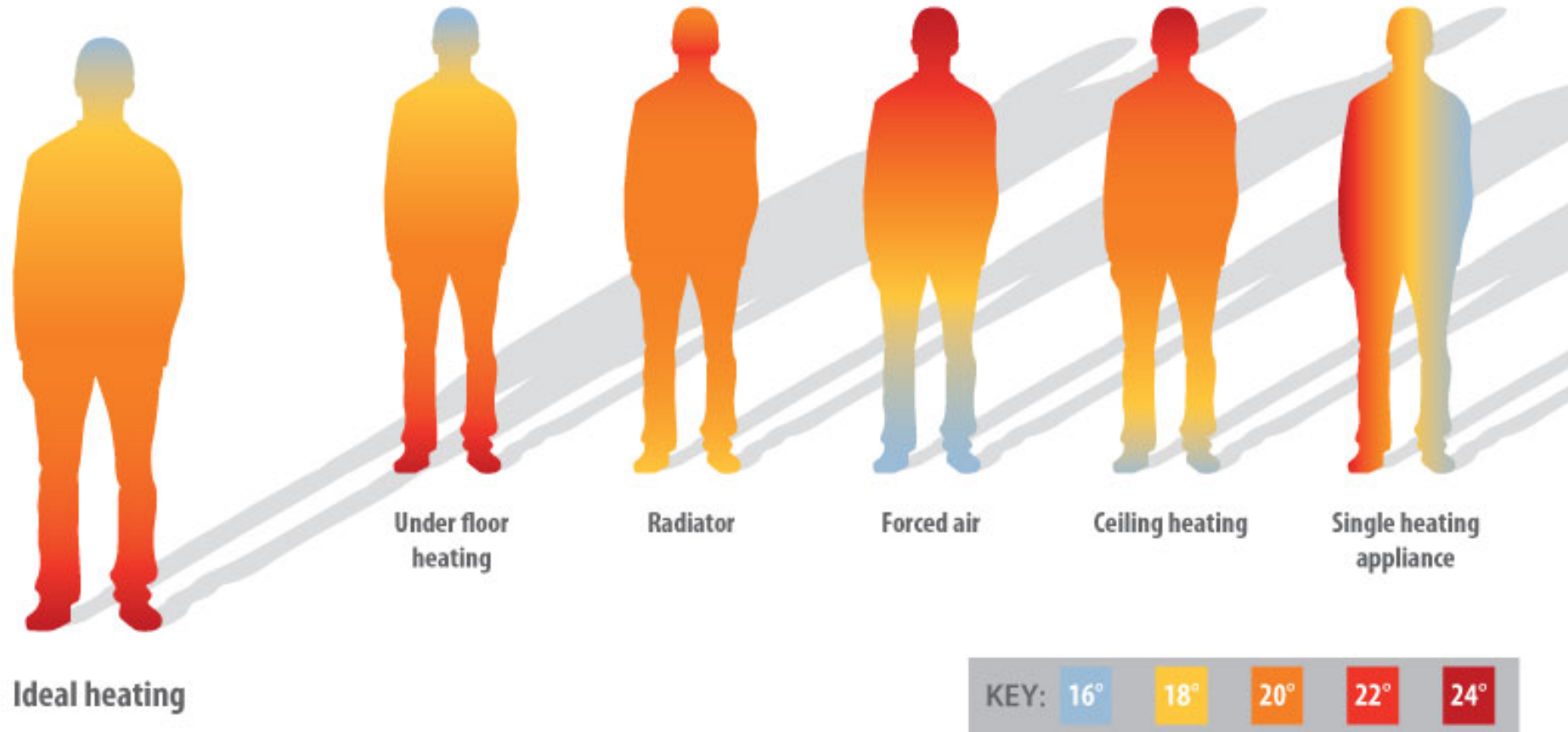


Radiator

Radiant Heat

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Christchurch Family Home

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Queenstown Home

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Lindis Luxury Lodge

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Christchurch Convention Center

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**Welcome to
Alexander Watzek
VARIOTHERM**



VARIOTHERM

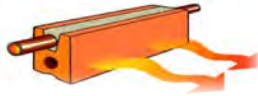
- Relationship since 2013
- Fantastic supplier
- Innovative Underfloor system
- Wall & Ceiling heating and cooling



Comfort with surface
heating and cooling systems

Our success story: 40 years Variotherm

- The success story begins in 1979 when **Wilhelm Watzek** founded Variotherm producing **skirting heaters** in Vienna



- 1984 a milestone was the award of the European patent for our **heat storage stones**

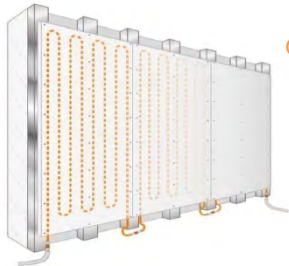


- In the 1990th the first **system wall heating** system and the **Varioclimate pipe** has been developed



- 1992 transfer to the **new commercial building in Leobersdorf**, because the premises in Vienna became too small

- 1995 launch of our **floor heating system**



- 1999 Wilhelm Watzek, transferred the company to his son, the engineer **Alexander Watzek**

- In 1999 the modular wall heating was completed as a system after a long development period



Our success story: 40 years Variotherm



- In 2003 our fully automated production facility for panels with integrated heating pipes was constructed and new premises were built

- The modular ceiling cooling system has been in production since 2004

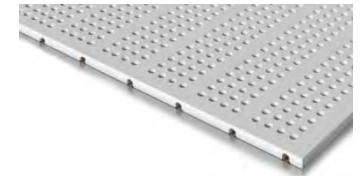


- In 2005 a fully automated production facility for VarioComp floor heating systems was built and an expansion of the production sites took place.

- In 2008 the new VarioProFile pipe 16x2 Laser was presented as main part of the surface heating and cooling systems of Variotherm



- In 2010 the approved ModuleCeiling cooling/heating system was for the first time available with a sound absorbing = acoustic surface



Our success story: 40 years Variotherm

- In 2010 the 2nd fully automated production facility for VarioComp floor heating systems was set up



- A forward-looking expansion of our location and the biggest investment phase in our company's history took place in 2013: Two new halls offer more space for storage and production plus complete outdoor facilities, parking lots & oasis of relaxation for our employees



- In 2015 a milestone represents the production machine FBHK 3, which has been specifically designed for the superslim heating system VarioComp



- After months of development and research the new VarioManifold 5.0 heating/cooling distribution manifold has been introduced in 2016 into the market.



- Extensive, 650 m² extension completed in 2017, including office spaces, consultancy and training centre, research & development areas and VarioCafé.



Awards

- Social Award „Wirtschaft hilft“ 2017
- Recognition Award for VarioKomp by the government of Lower Austria 2015
- ALC Audience Award 2014
- Knowledge National Award 2014
- ALC Audience Award 2011
- Innovation Award 2006
- ALC Audience Award 2005
- Leonardo 2005
- Multiple Innovation Awards by the government of Lower Austria



Variotherm 2019

- Austria: 443 customers
- Germany: 10 business partners
- Europe: 42 business partners
- Worldwide: 4 business partners



Portfolio

- 850.000 m² Modular Floor heating system VarioComp since 2001
- 1.200.000 m² Screed-Floor heating systems since 1994
- 450.000 m² SystemWall heating/cooling since 1987
- 363.000 m Skirting heating systems since 1979
- 273.000 m² Modular Wall heating/cooling system (ceiling cooling included) since 1999
- 61.000 m² EasyFlexWall heating systems for tepidarums and tiled stoves since 1983
- 20.700 m Trench heating systems since 1997

Figures 10/19

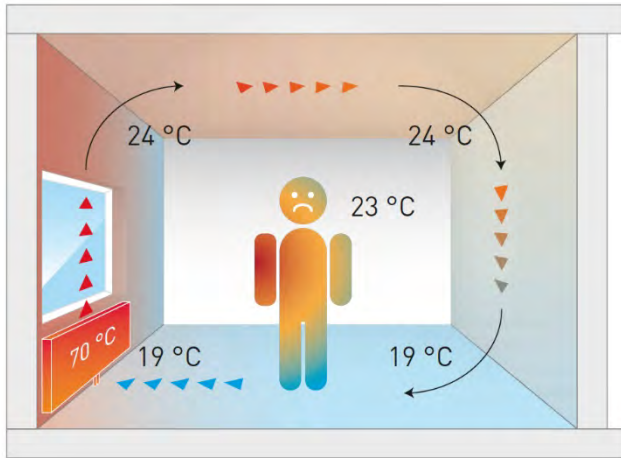




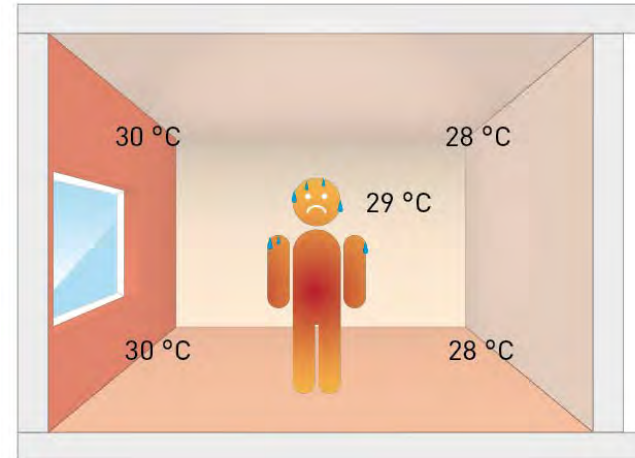
HUMAN BEINGS AND THE INDOOR CLIMATE

What makes people feel comfortable?

Winter



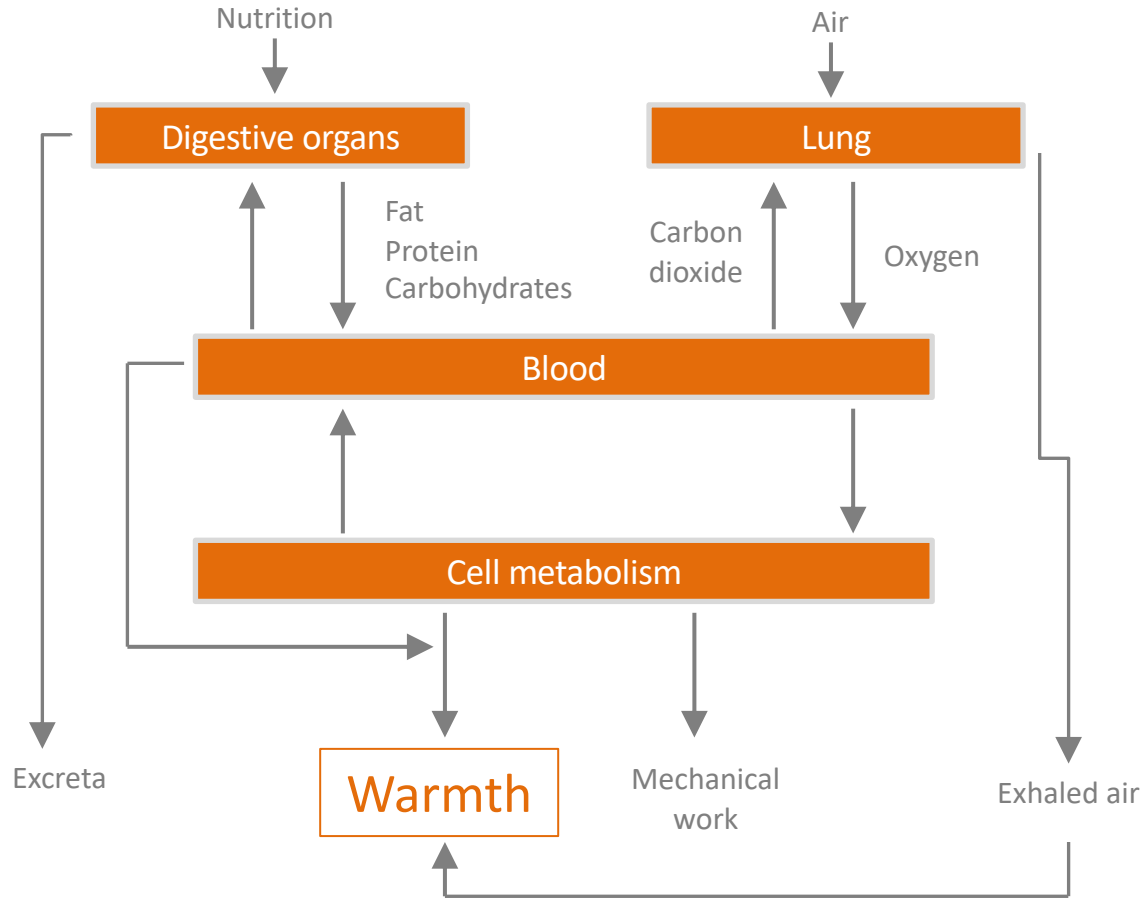
Summer



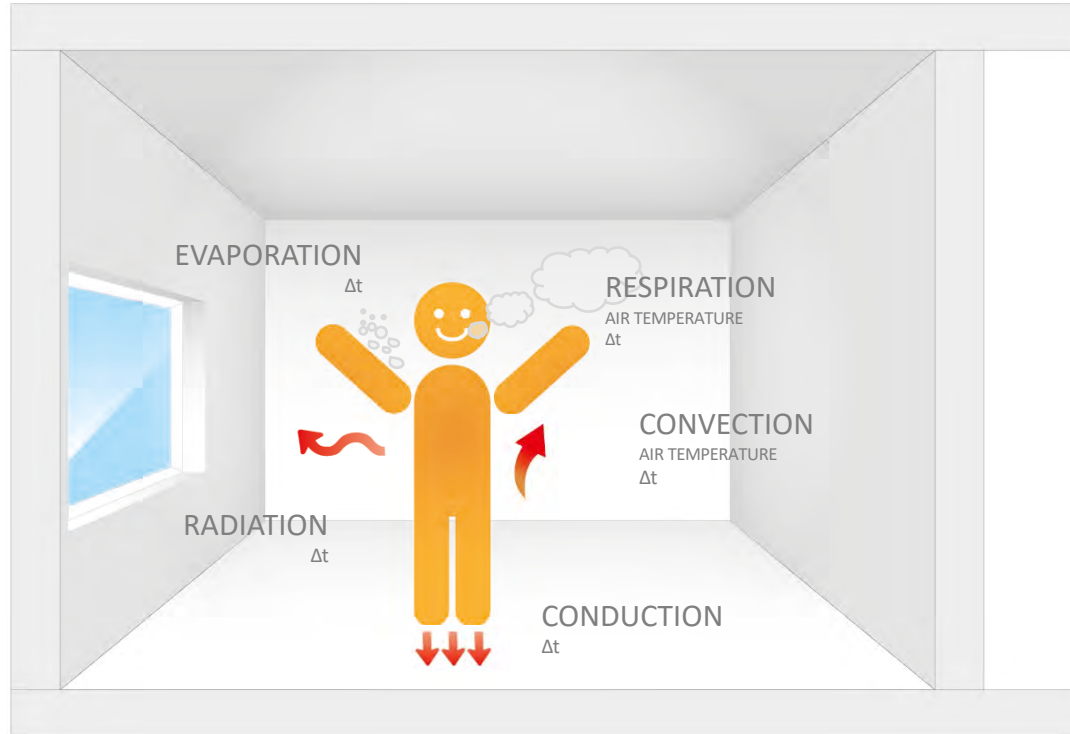
Everyone just wanted the best.
Then why is there so much dissatisfaction?

What about comfort?

Human heat production



How humans lose their temperature?



Human heat emission in %

In a heated living space	Q_{Ra}	Q_{Conv}	Q_{Re}	Q_{Co}	Q_E	ΣQ
ACTUAL _{Heating}	40-60	20-30	5-20	2-5	2-15	100 %
ACTUAL _{Cooling}	30-40	10-30	10-30	1-5	5-25	100 %
TARGET	40	30	20	3	7	100 %

Q_{Ra} ... Heat emission through radiation

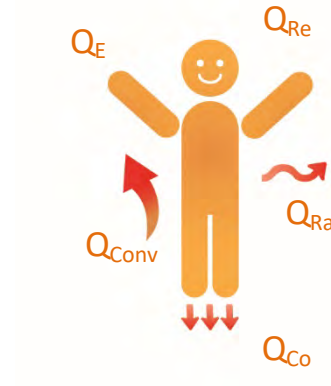
Q_{Conv} ... Heat emission through convection

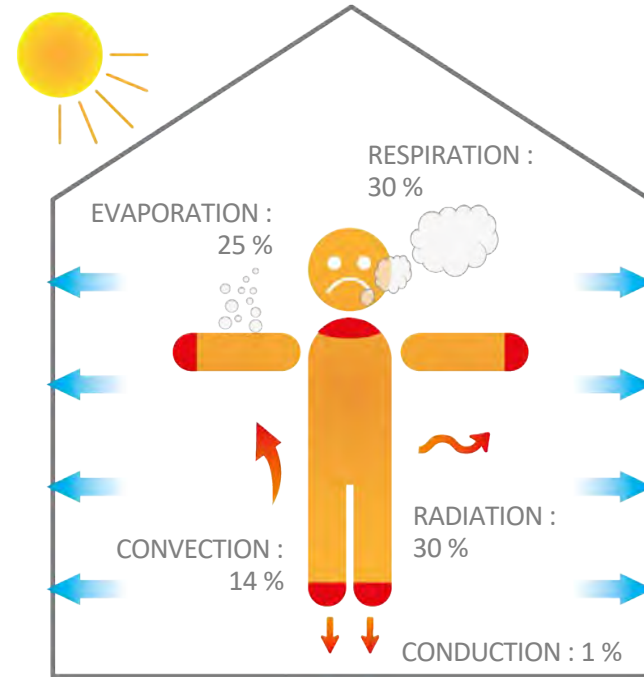
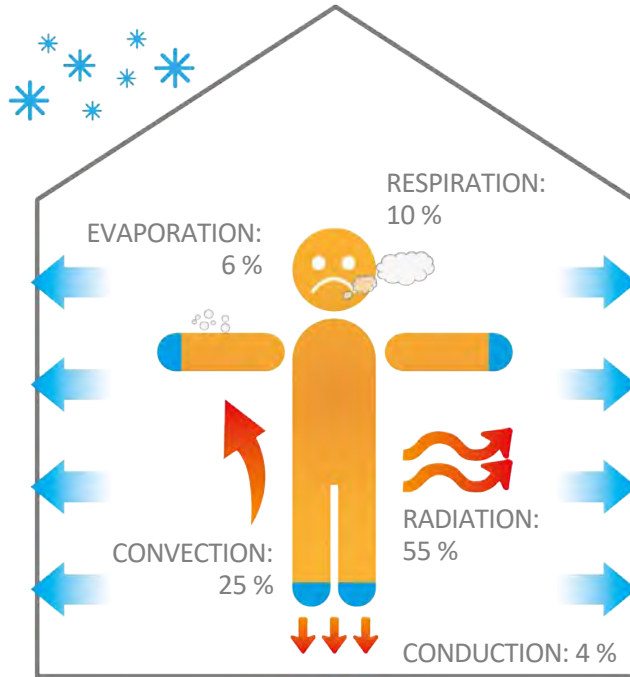
Q_{Re} ... Heat emission through respiration

Q_{Co} ... Heat emission through conduction

Q_E ... Heat emission through evaporation

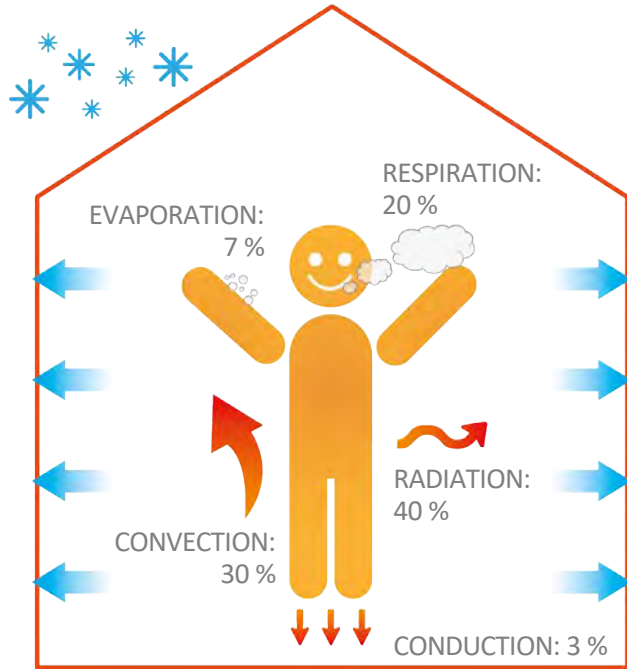
$$\Sigma Q = Q_{Ra} + Q_{Conv} + Q_{Re} + Q_{Co} + Q_E$$



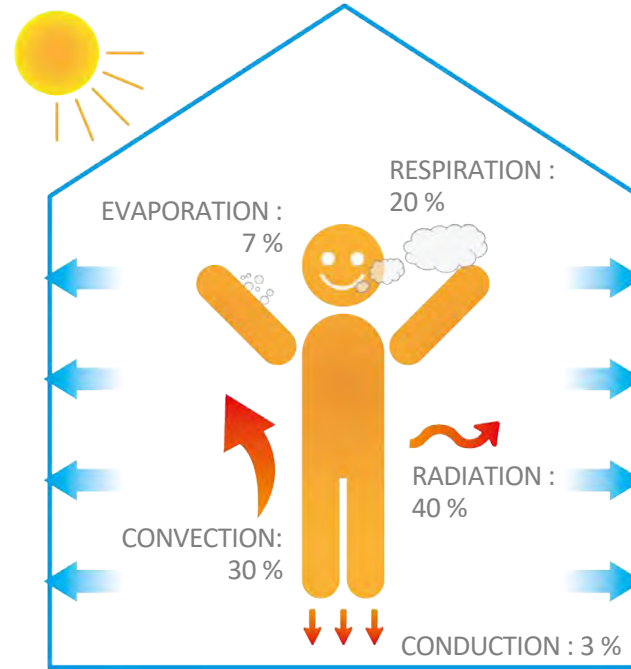


Not comfortable!

Heat production = Heat loss



HEATING



COOLING

100 % Comfort

→ Up to 25 % energy saving!

- 1 Intelligent structural engineering/planning
Good insulation, building materials

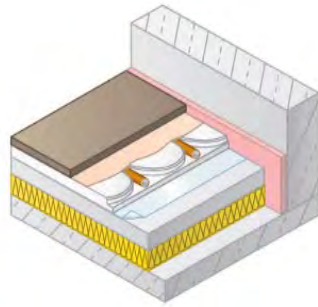
- 2 Surface heating and cooling systems
→ Large heating/cooling surfaces
→ Focus on the right temperature differences



Ceiling cooling/heating
Wall heating/cooling
Floor heating



Products



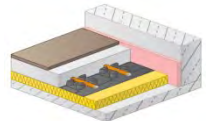
○ Module Floor VarioComp



○ Ceiling cooling/heating drywall



○ Wall heating/cooling drywall



Floor heating screed floors



Skirting heating



Trench heating



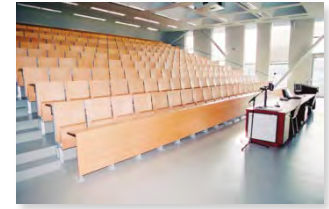
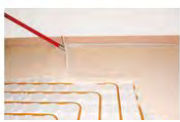
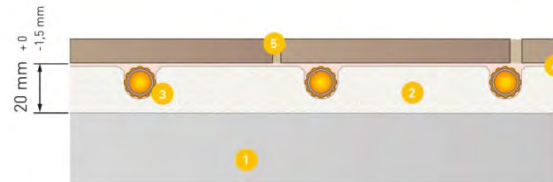
Plastered wall heating/cooling

Drywall floor heating system: The superslim VarioComp

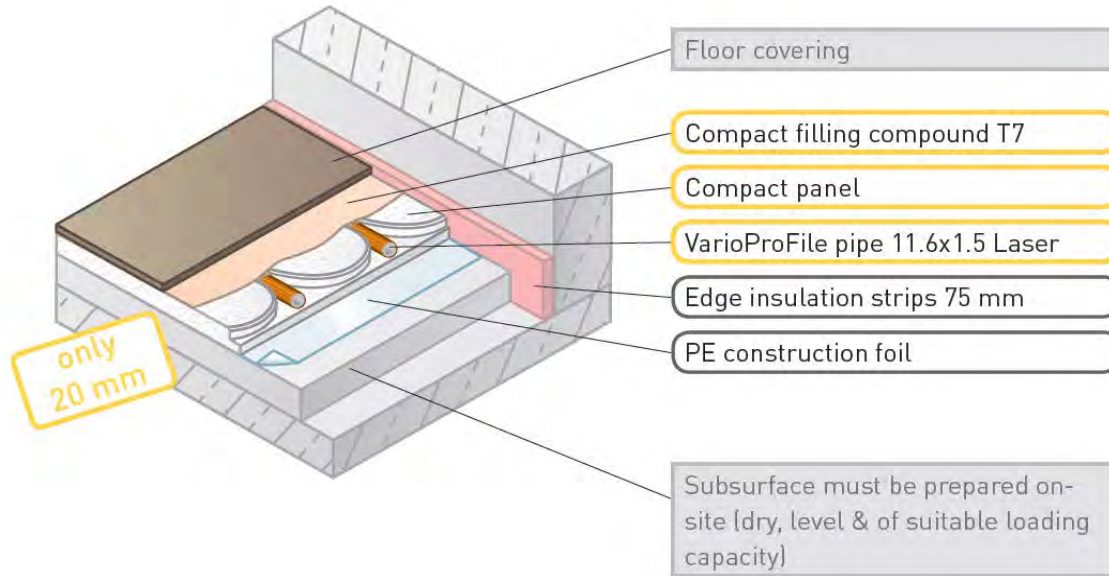
- Superslim! Panel thickness just 20 mm
- Energy-saving low temperature system
- Low weight! Ideal for drywall construction and renovation of old buildings
- Optimal heat transfer: VarioModule pipes are fully embedded in the compact filling compound
- Floor heating system with extremely rapid reaction and excellent controllability
- Fast and simple assembly

VarioComp

- 1 Substructure
- 2 VarioComp panel 600 x 1000mm
- 3 VarioProFil pipe, 11.6 x 1.5 Laser
- 4 VarioCompfilling compound
- 5 floor covering

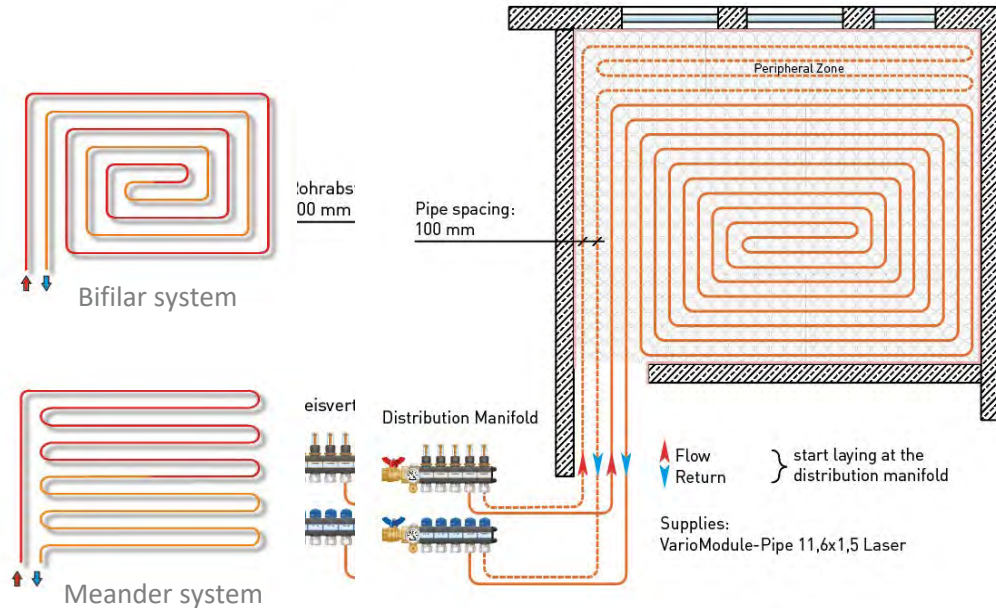


Drywall floor heating system: **The superslim VarioComp**



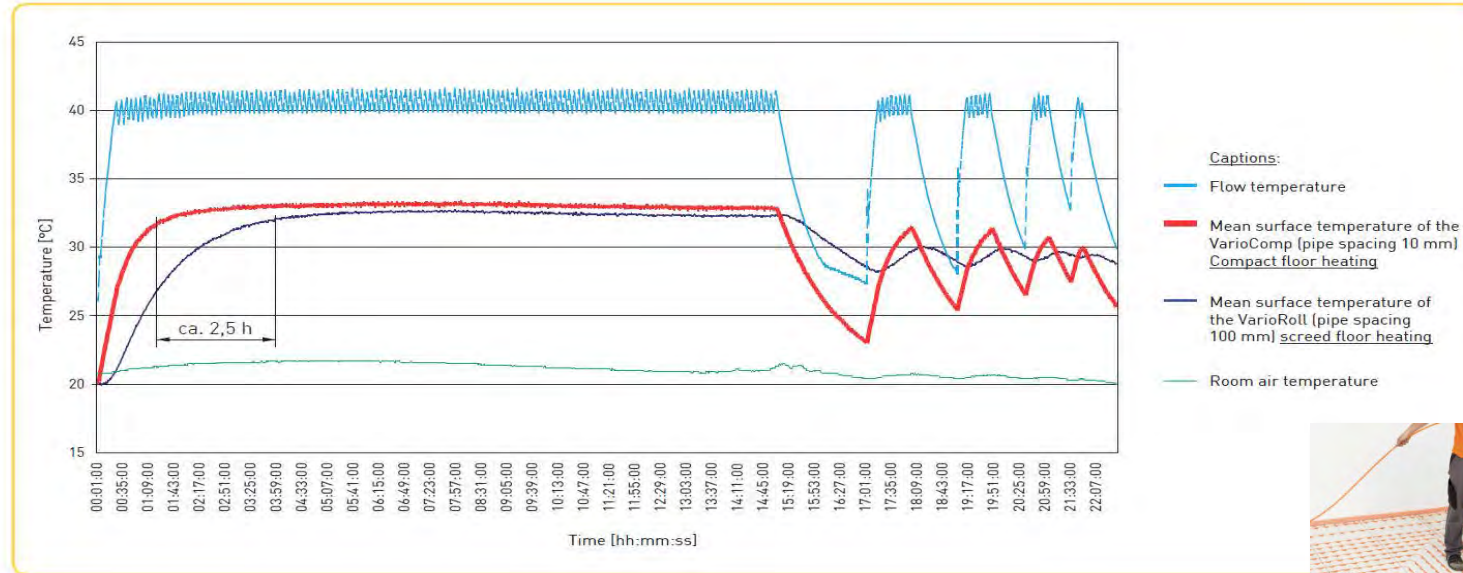
Drywall floor heating system: The superslim VarioComp

Flexible and accurate pipe laying:



Example layout

Drywall floor heating system: The superslim VarioComp



- Faster heating of the surface of the modular floor heating system compared to the screed floor heating system
- The reaction time of the surface temperatures to reduced flow temperature is shorter which results in:
 - ➔ Better control of the modular floor heating VarioComp
 - ➔ More efficient layout of the heating surfaces due to lower flow temperatures

Drywall floor heating system: The superslim VarioComp

- Extremely **high heating power**
- Very **fast construction progress**
- The floor covering can already be laid **after at least 24 hours**

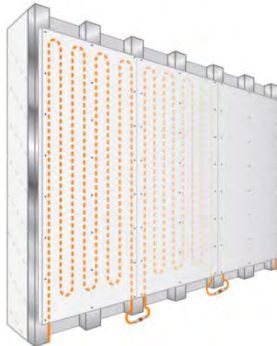
Floor covering [Take note of the manufacturer's instructions!]	CM value [for measuring, remove 100 g of filling compound]	Estimated drying time at $t_i = 20\text{ °C}$, max. 50 % relative humidity	
		without baking out	with baking out ¹¹ at $t_f = 40\text{ °C}$
Stone & ceramic coverings in a thin bed	1.3 %	6 days	24 h
Wood covering, parquet	0.3 %	8 days	36 h
Linoleum, PVC, vapour-tight floor covering (floor-levelling compound already applied as per chapter 5.7)	0.3 %	not possible	≥ 48 h

¹¹ At $t_i = 20\text{ °C}$, you must wait at least 4 hours after finishing applying the filling compound before beginning the baking out process.



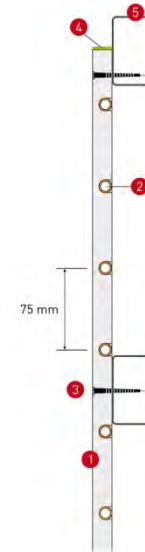
Wall heating/cooling drywall: **The Module Wall**

- Ideal for timber-framed buildings, pre-fabricated houses, attics and renovation
- Heating system: large-surface, extremely energy-saving **low temperature system**
- Cooling system: **silent, no draughts**, energy-saving
- Heating, cooling and **finished wall/ceiling in one!**
- A totally flexible panel system: **10 modular panels** fulfil all building requirements

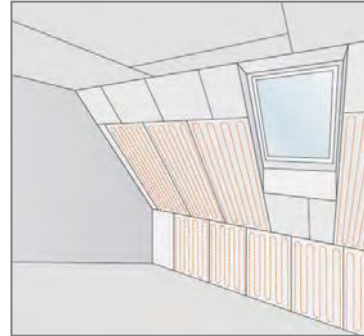


ModulePanel

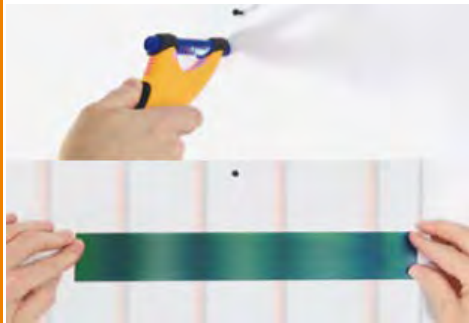
- 1 Gypsum fibreboard 18 mm
- 2 VarioProFile pipe, 11.6 x 1.5 Laser
- 3 Fastening screws
- 4 Joint adhesive
- 5 Substructure



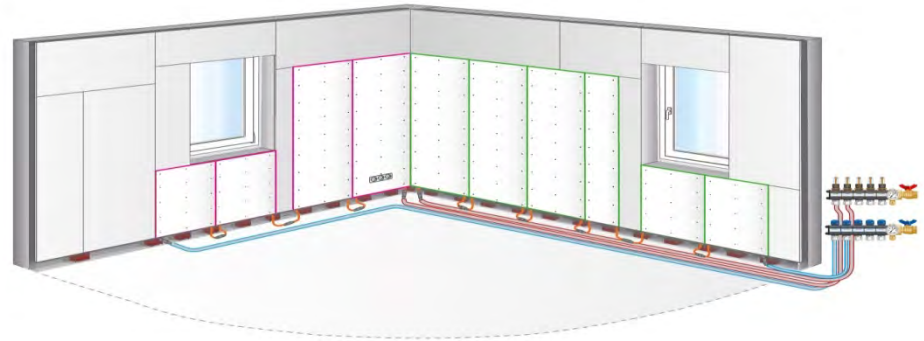
Wall heating/cooling drywall: **The Module Wall**



The ModuleWall panels are finished wall, heating and cooling systems in one.

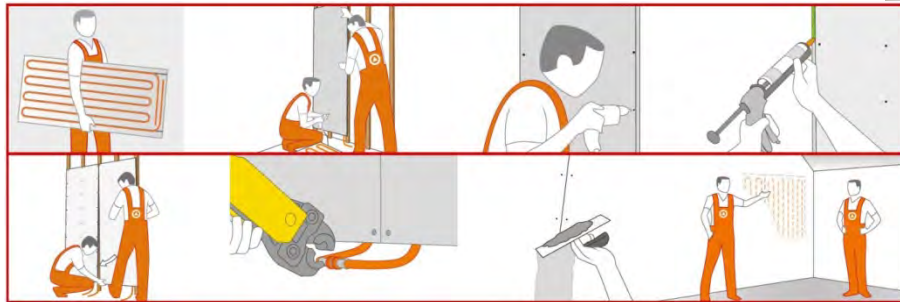


The pipes are easy to locate with the Variotherm pipe locator or the thermofoil

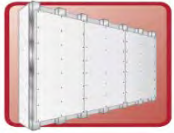


Wall heating/cooling drywall: **The Module Wall**

Installation

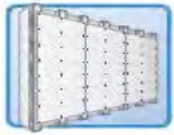


Wall heating/cooling drywall: The Module Wall

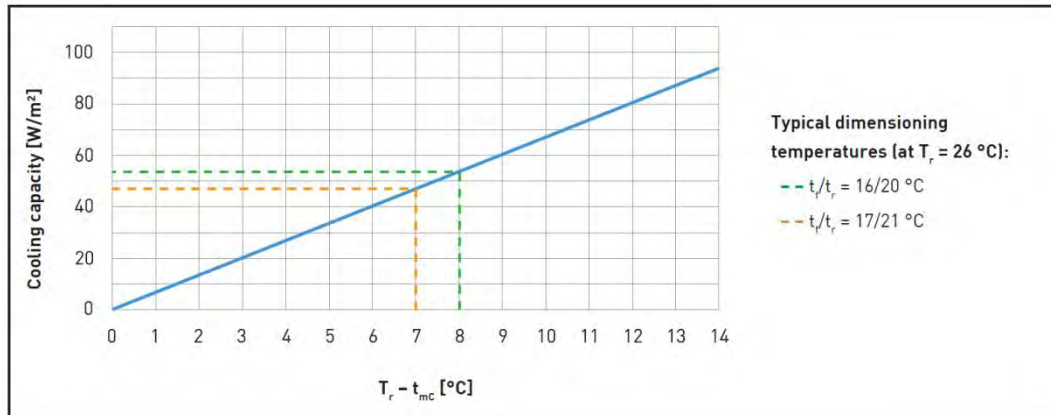


Heat output in W/m²:

t_f/t_r [°C]	t_{mH} [°C]	Heat output [W/m ²] at room temperature ...					T_0 [°C] (at $T_r = 20$ °C)
		... 15 °C	... 18 °C	... 20 °C	... 22 °C	... 24 °C	
35/30	32.5	144	113	92	73	54	29
37.5/32.5	35.0	162	131	111	91	73	31
40/30	35.0	162	131	111	91	73	31



Cooling capacity



Wall heating/cooling under plaster: **SystemWall. EasyFlex wall.**

- Proven surface heating/cooling systems for plastered interior finishing
- **Heating system: energy-saving low temperature system** or high-performance wall heating with slim profile
- **Cooling system:** silent, no draughts, energy-saving
- **Optimized heat transfer:** The surface of the VarioProFile pipes is 10% to 15% bigger than compareable pipes
- Complete systems instead of individual components
- Excellent value for money
- The SystemWall has been awarded the **IBO quality seal** (Austrian Institute for Healthy and Ecological Building)!



Systeme

Selten aber möglich – verputzt!



Drywall Ceiling Cooling/Heating System: The ModuleCeiling Classic



The ModuleCeiling-Classic
for non suspended ceilings



- **Made-to-measure systems** for drywall construction and plastered interior finishing
- Large-area **cooling of ceilings** and walls
- **Complete systems** instead of individual components
- Low energy costs thanks to efficient low temperature systems
- **Biological material** and **completely silent**.
- Pleasant conditions – like in the shade of a large tree

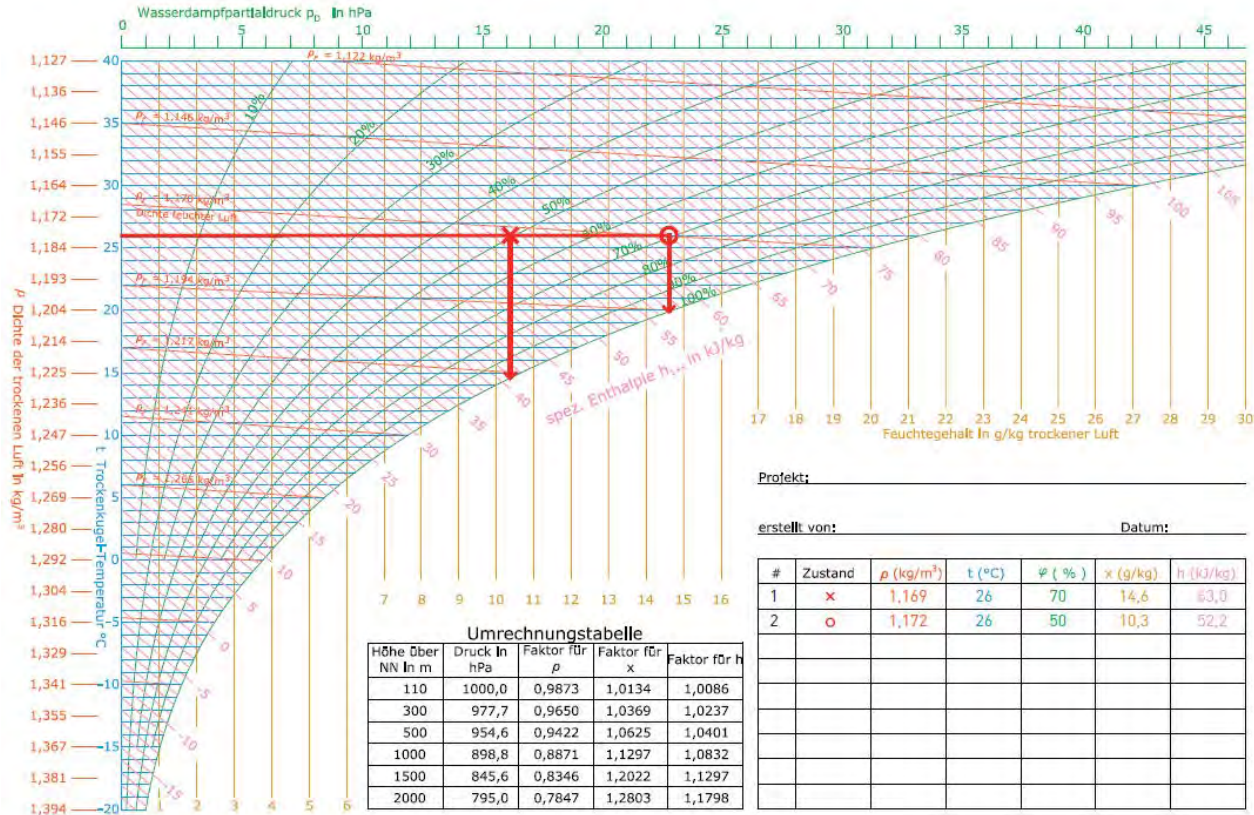
Dewpoint

Relative Luftfeuchte [%rF]	Raumtemperatur				
	24 °C	25 °C	26 °C	27 °C	28 °C
70 %	18	19	20	21	22
60 %	15,5	16,5	17,5	18,5	19,2
50 %	13	14	15	15,8	16,8
40 %	9,8	10,5	11,5	12,5	13,2

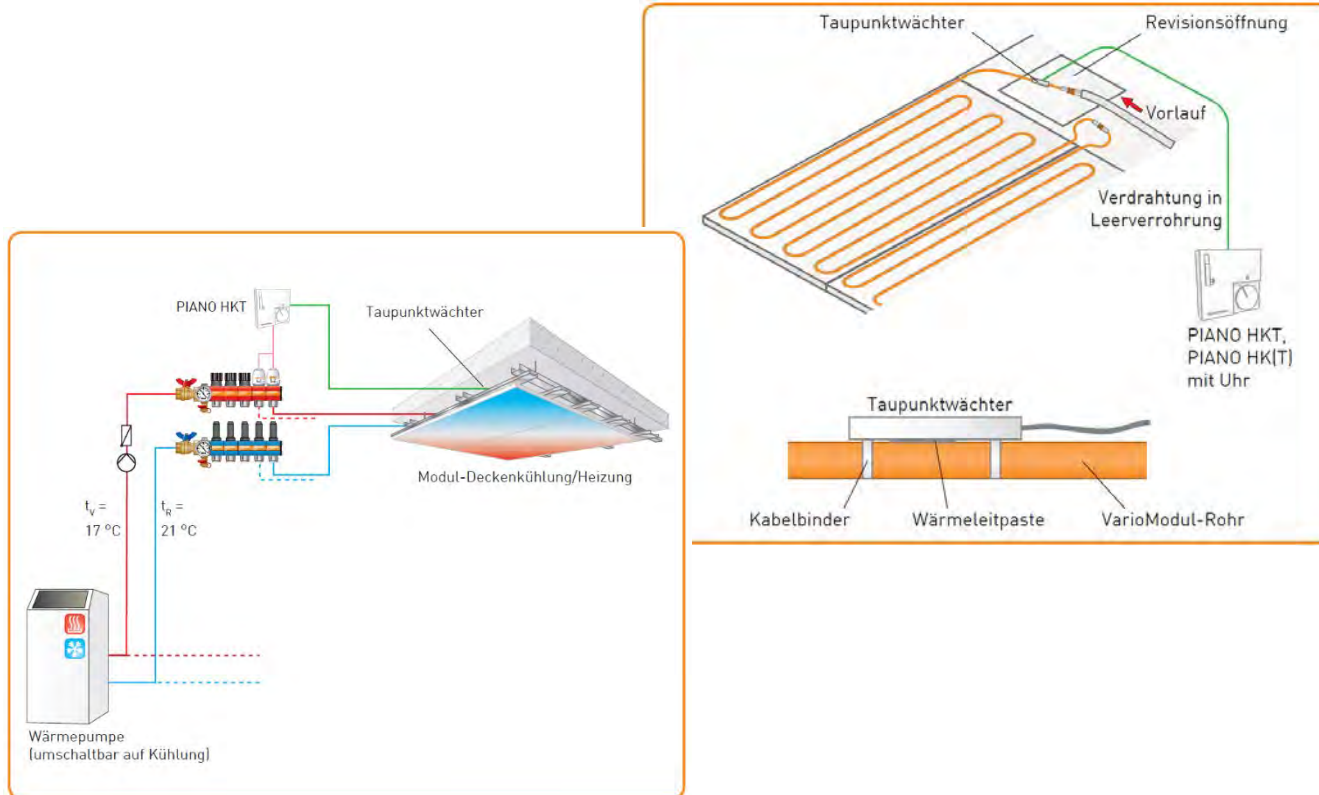
Dewpoint issue

Mollier-h,x-Diagramm für feuchte Luft

Gesamtdruck 1013,15 hPa

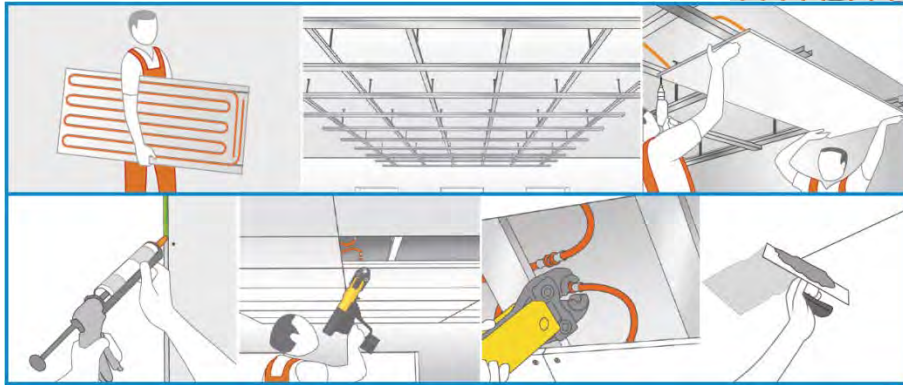


Dewpoint control

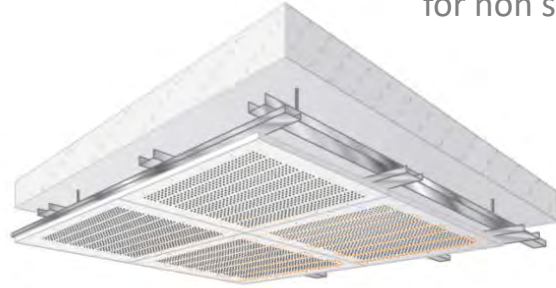


Drywall Ceiling Cooling/Heating System: The ModuleCeiling

Installation



Drywall Ceiling Cooling/Heating System: The ModulCeiling-Acoustic

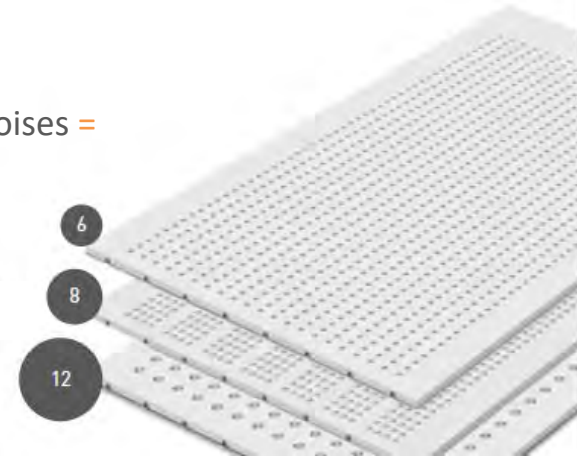


ModulCeiling-Acoustic
for non suspended ceilings

- Noise protection, cooling and heating - all in one ceiling
- The hole pattern on the front side reduces background noises = better room acoustic

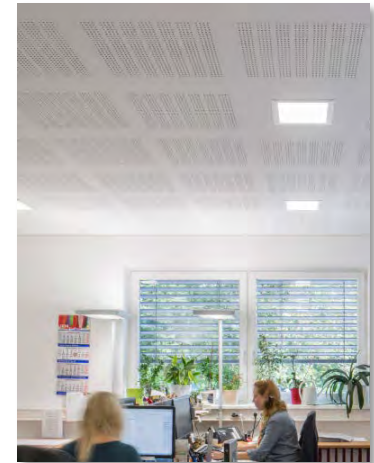
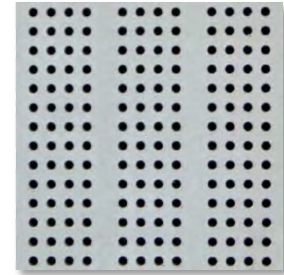
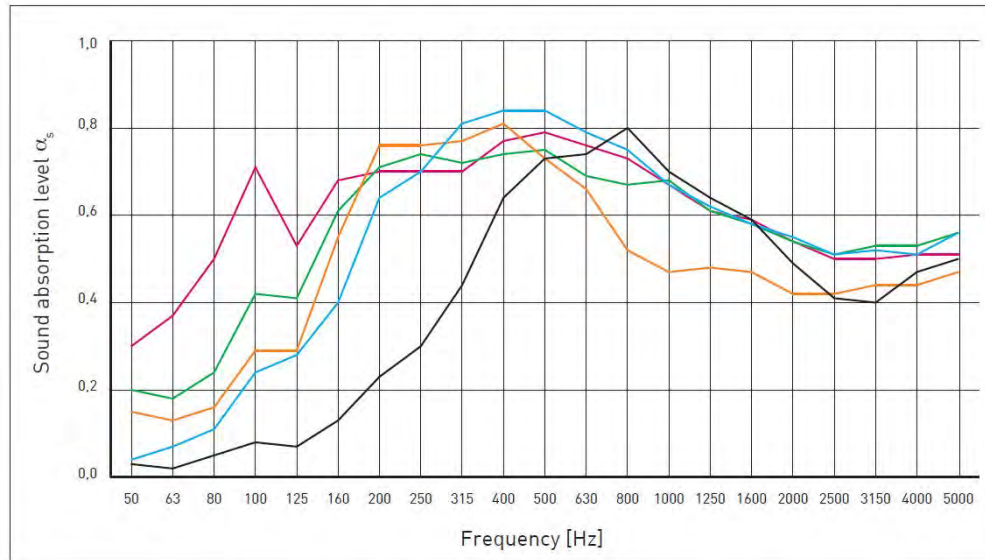


hole sizes



Drywall Ceiling Cooling/Heating System: The ModuleCeiling -Acoustic

Proofed sound reduction



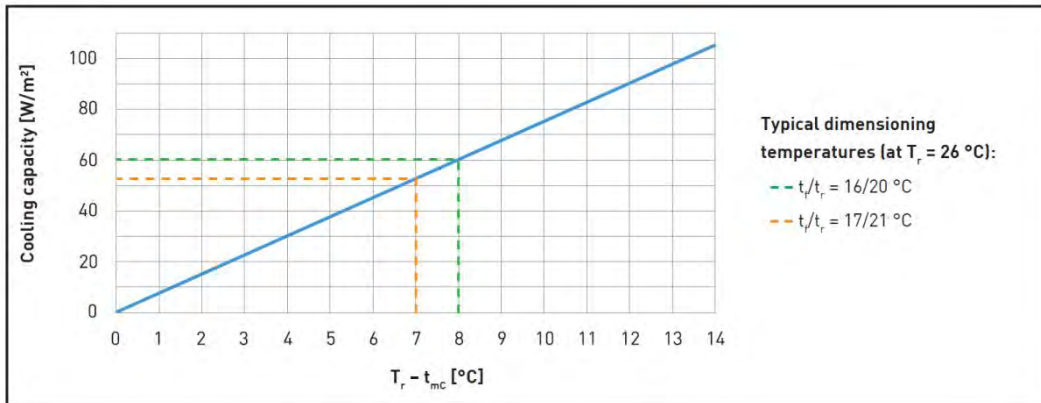
Drywall Ceiling Cooling/Heating System: The Modular Ceiling

Heat output in W/m^2 :

t_f/t_r [°C]	t_{mH} [°C]	Heat output [W/m^2] at room temperature ...					T_0 [°C] (at $T_r = 20$ °C)
		... 15 °C	... 18 °C	... 20 °C	... 22 °C	... 24 °C	
30/25	27.5	68	54	41	28	15	28
35/25	30.0	82	67	55	42	28	29
35/28	31.5	90	75	62	49	36	30
35/30	32.5	96	81	68	55	42	31

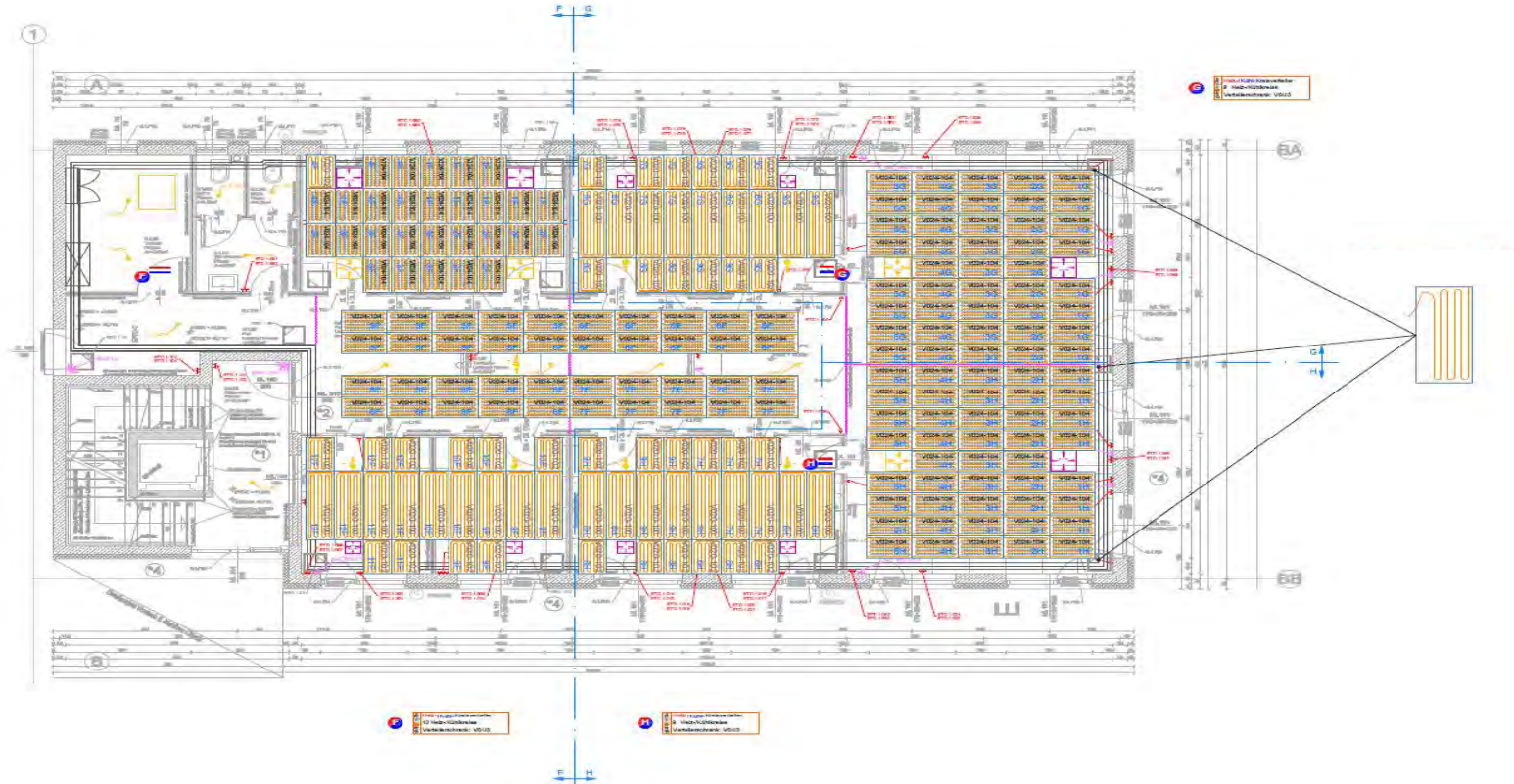
Chart valid with ceiling height 2.5–3.5 m. Do not exceed $t_{mH} = 35$ °C because of reasons of comfort!

Cooling capacity

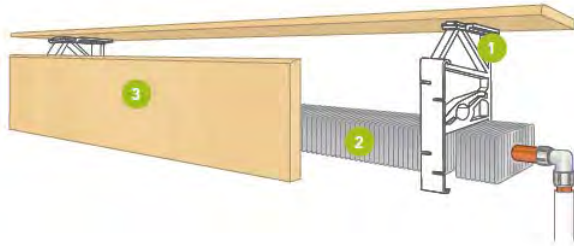


Drywall Ceiling Cooling/Heating System: The ModuleCeiling -Acoustic

Variotherm service → individual drawings

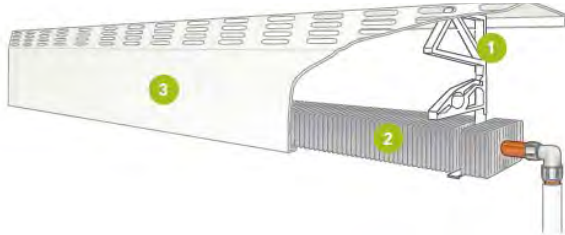


Individual heating: Skirting Heating Classic and Delta



Classic skirting heating system

- 1 Bracket
- 2 Heating element
- 3 e.g. wooden cladding



Delta skirting heating system

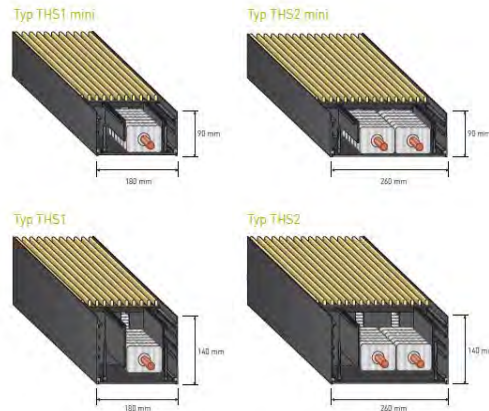
- 1 Bracket
- 2 Heating element
- 3 Metal cladding

- Instantaneous hot water heating system
- Extremely energy-saving
- Classic totally customizable
- Delta available in 200 RAL colors
- Hot air veil generated along cold walls
- Shields room from the cooling effect of glass surfaces
- Combats damp and the formation of mold on the walls



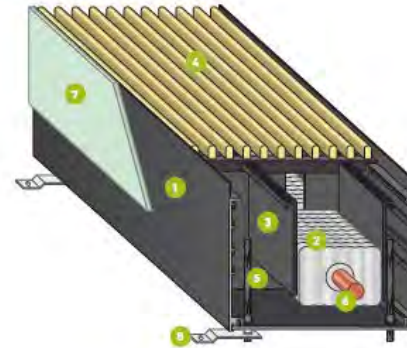
Fast response: Trench heating system

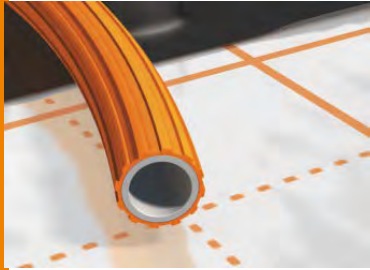
- Efficient protection against the cold effects of glass surfaces!
- The louvre shape of the cover grate directs the rising hot air directly to the cold glass surfaces
- The build up a veil of warm air along cold glass surfaces is lightning fast
- Inconspicuous! They do not affect individual room use in any way
- Lengths are built exactly to your requirements
- Grids in 3 different colours



TRENCH HEATING

- 1 Trench heater frame
- 2 Heating element
- 3 Air baffle plate
- 4 Grid
- 5 Adjustment screws
- 6 Copper pipe/alternative stainless steel pipe
- 7 Side strips, green
- 8 Attachment bracket





The VarioProFile pipe.

ALUMINIUM. MULTI-LAYER. COMPOSITE PIPE.

- Profiled surface structure for optimised heat transfer
- First-class plaster adhesion for wall heating systems
- Fully corrosion-free
- High pressure and temperature resistance (10 bar, +95°C)
- Flexible, easy to bend, extremely good hydrostatic stability
- 100 % oxygen diffusion-tight
- Mirror-smooth inner surface – less pressure loss – no encrustation

VARIOPROFILE-PIPE 16x2 LASER
5-layer composite pipe

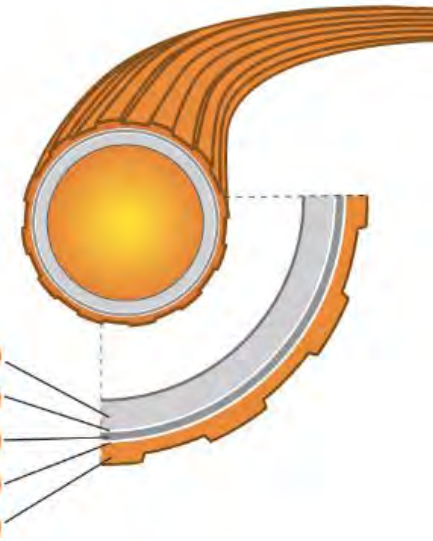
Raised temperature resistance polyethylene PE-RT 1

Adhesive layer 2

Homogeneous laser-welded solid aluminium pipe 3

Adhesive layer 4

Raised-temperature-resistance PE-RT with profiled surface structure for optimised heat transfer. 5



VarioManifold 5.0

THE MODULAR ALL-ROUNDER



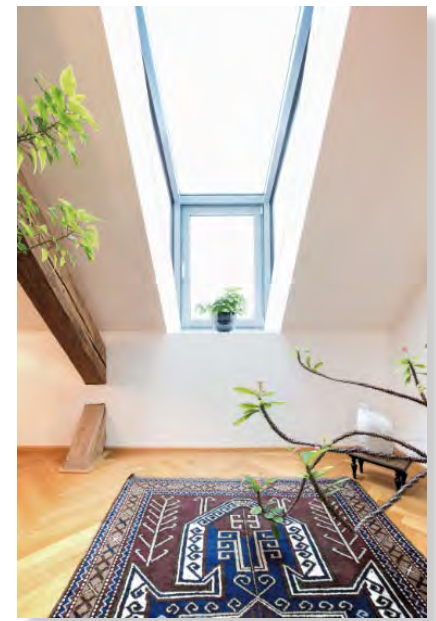
1. **In any cabinet:** the individual segments are just 50 mm wide and therefore fit manifold cabinets just 80 mm deep
2. **Flexible positioning:** the bracket technology (click installation) combined with the installation rail guarantees extremely simple and flexible installation
3. **Easy to clean:** the transparent viewing glass is easy to unscrew and clean under pressure
4. **Precision configuration:** with orange fixing ring



Private houses



Private house – Attic extension

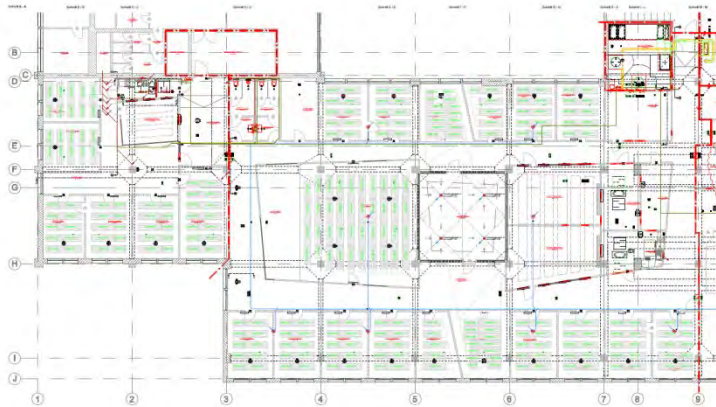
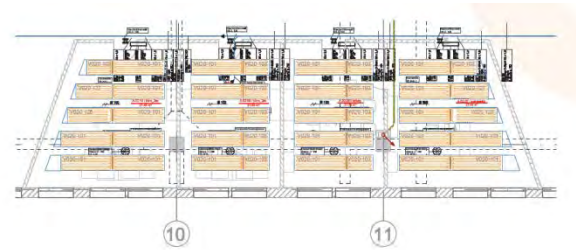


- Ceiling cooling/heating drywall by Variotherm on the ceiling and in the pitched roof area
- Wall heating/cooling on the walls

Public buildings



Ceiling cooling/heating drywall



Nursery schools



Floor heating



Education



Cambridge: Wall heating/cooling drywall



Eisenstadt: Floor heating



Work on listed buildings



- VarioComp floor heating (Modular floor heating system)
- Vario Fix floor heating (Screed floor heating system)
- EasyFlexWall heating and cooling (Plastered wall) for uneven walls





Christchurch Bad Neustadt,
Germany

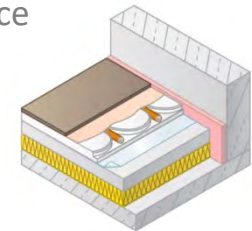
- The **Skirting Heating** systems of Variotherm alongside the walls or under the church benches ensure a comfortable warmth with a short response time.
- Systems used: Skirting Heating Classic with cladding and Skirting Heating Delta alongside the wall.



Carmelite monastery Graz, Austria

Modular Floor Heating Drywall

- The low profile (only 20 mm) **VarioComp floor heating system** is the perfect choice for retrofit
- Fast reaction time



Ceiling cooling/heating



kvm-tec

(IT-company in Tattendorf)

- 105 m² ModuleCeiling-Classic
- 87 m² ModuleCeiling-Acoustic
- 254 m² thermal activation of the ceiling
- 90 m² screed floor heating

Floor heating drywall



Restaurant Bentinck (NL)

Horse stables in the castle of Amerongen a listed building

- 100 m² floor heating drywall

HEATING. COOLING. COMFORT.



Thank you for your attention!