

UltraGas® (15 - 2000D)
floor standing condensing boiler, 15-2000 kW

Hoval

Vaduz, March 2013

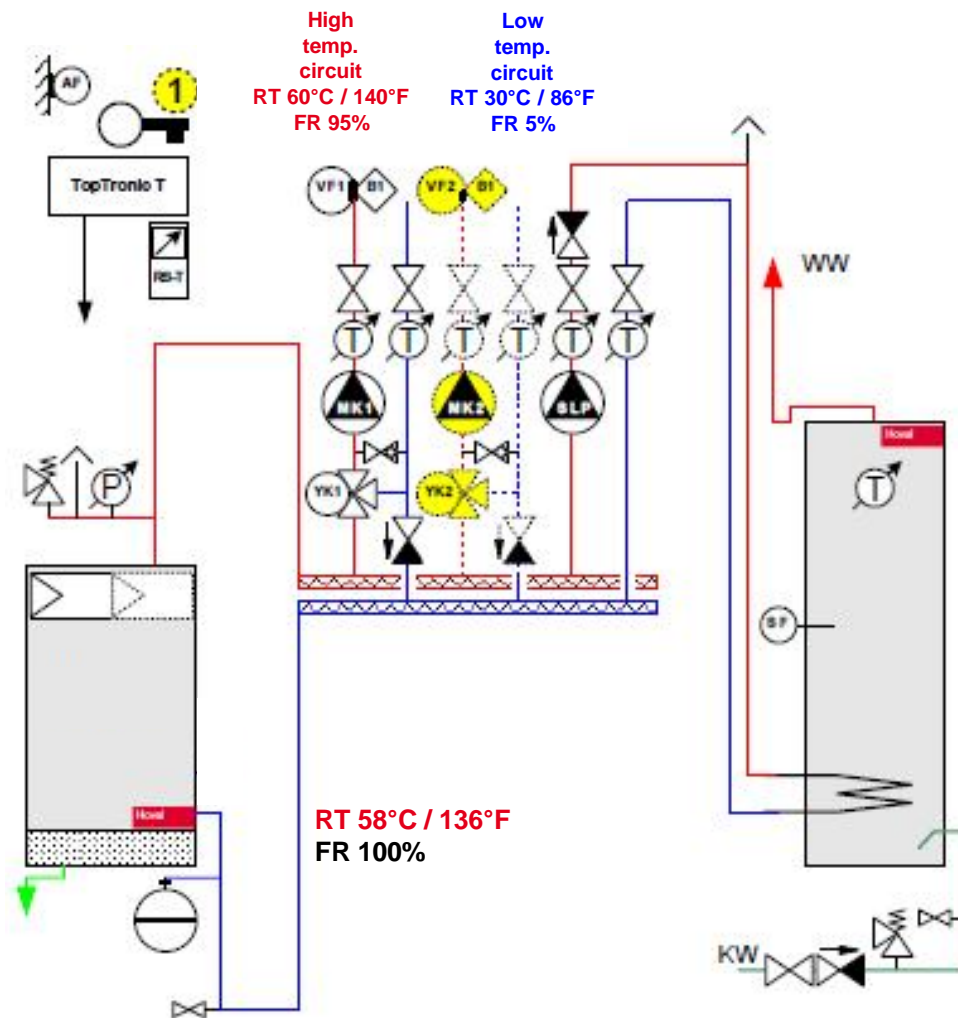
ZG1

ZG2

ZG3

Common hydraulic system Boiler with one return

Hoval



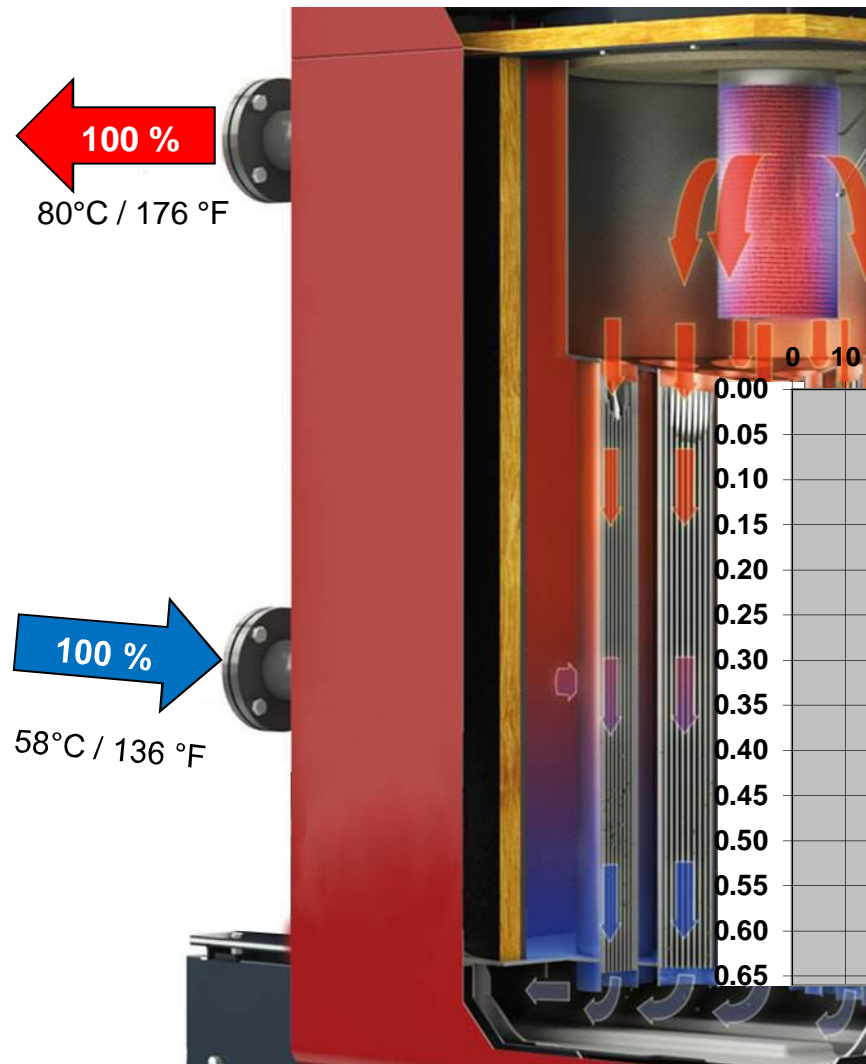
- Mixed **high temperature** heating circuit (return 60°C / 140°F)
- Mixed **low temperature** heating circuit (return 30°C / 86°F)
- Return header result temperature 58°C / 136°F
- Calorifier with heat supply from boiler

Dew point 55°C / 131°F

Efficiency behaviour

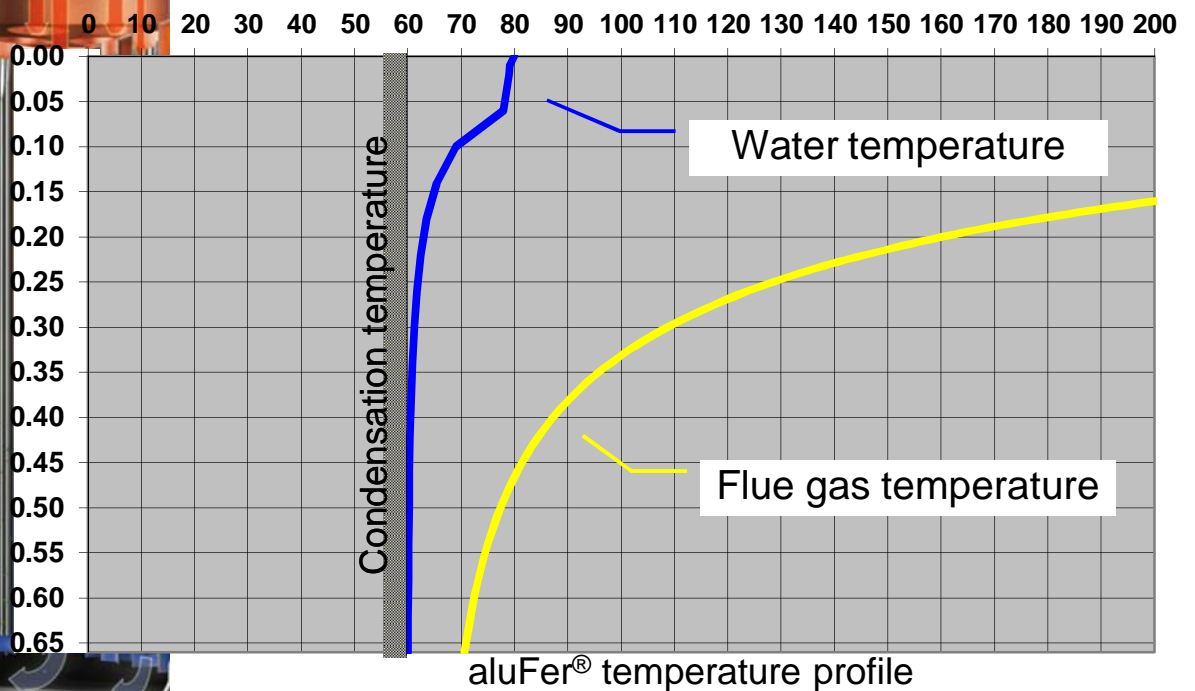
Boiler with only one return

Hoval

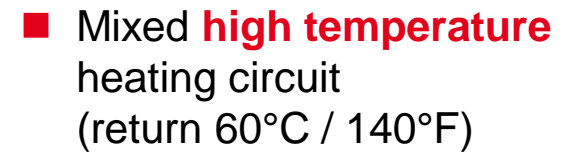


■ Mixed return temperature 58°C / 136°F
flow rate 100%

■ $\eta = 86\%$ with 100% burner load



Hoval



- Mixed **low temperature** heating circuit
(return 30°C / 86°F)

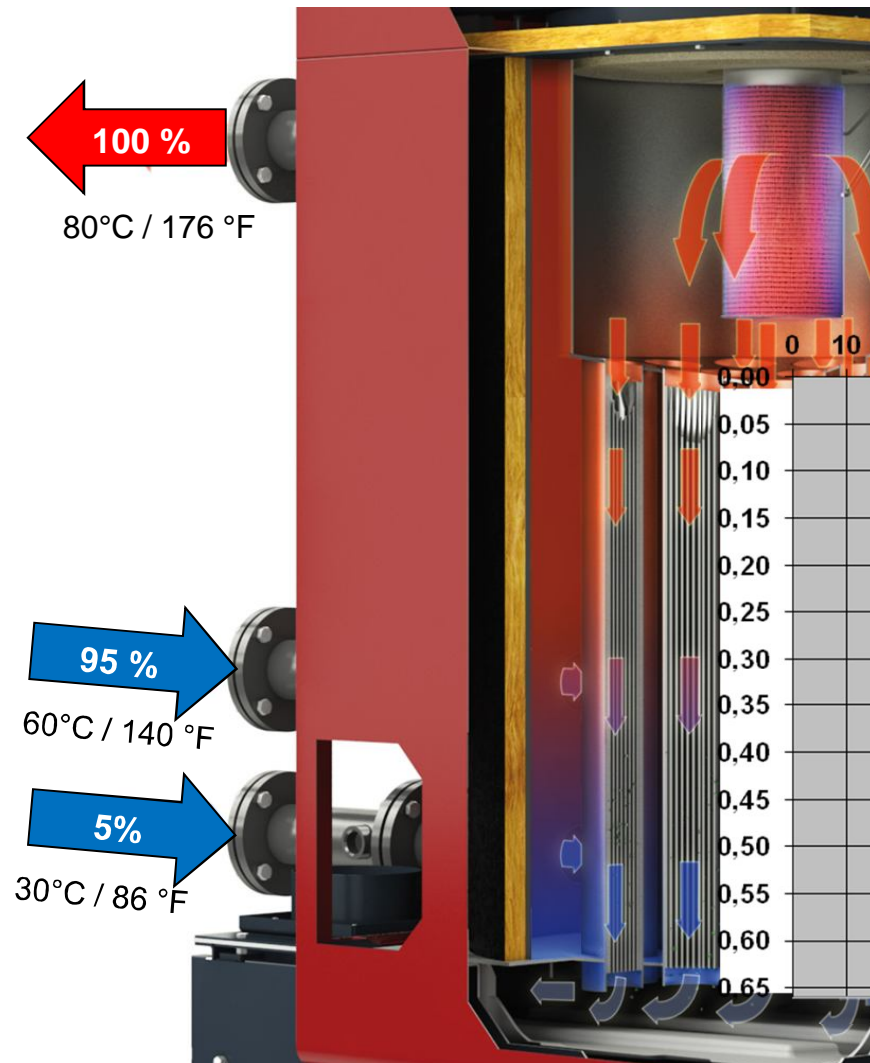
- ## ■ Splitted return header

- Calorifier with heat supply from boiler

Efficiency behaviour

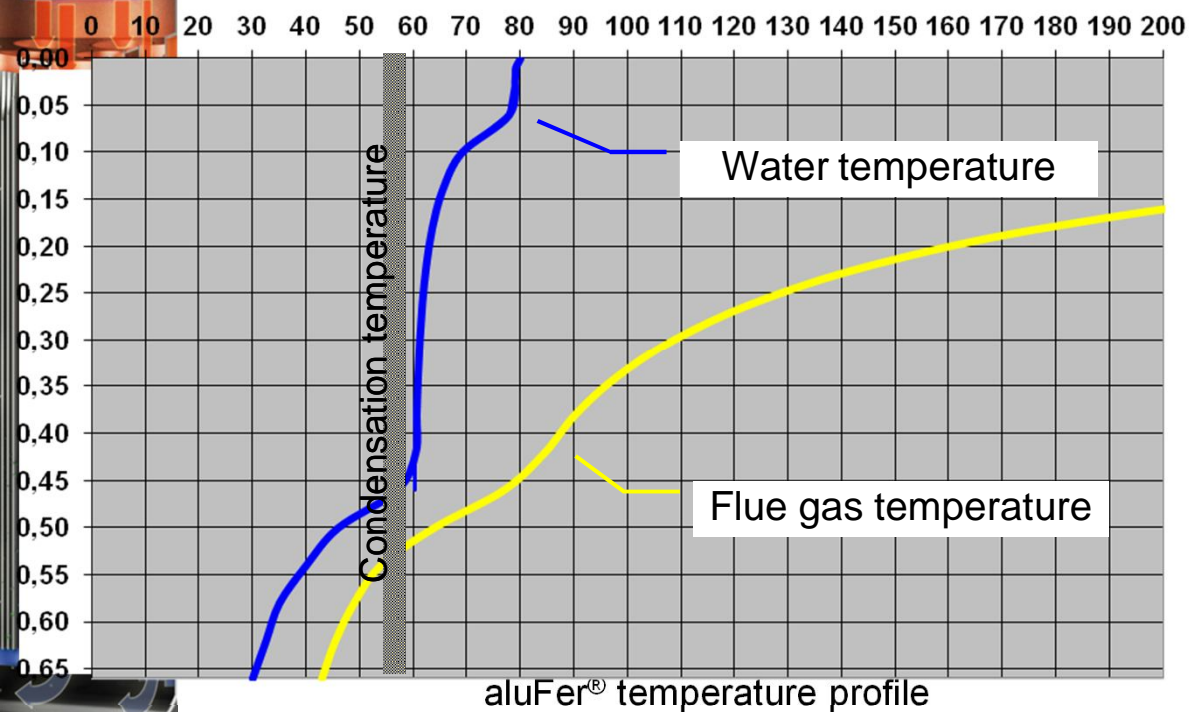
UltraGas® boiler design with two returns

Hoval



- High temp. return: 60°C / 140°F, flow rate 95%
- Low temp. return: 30°C / 86°F, flow rate 5%

- $\eta = 92\%$ with 100 % burner load
(6% gain in comparison to standard boiler)



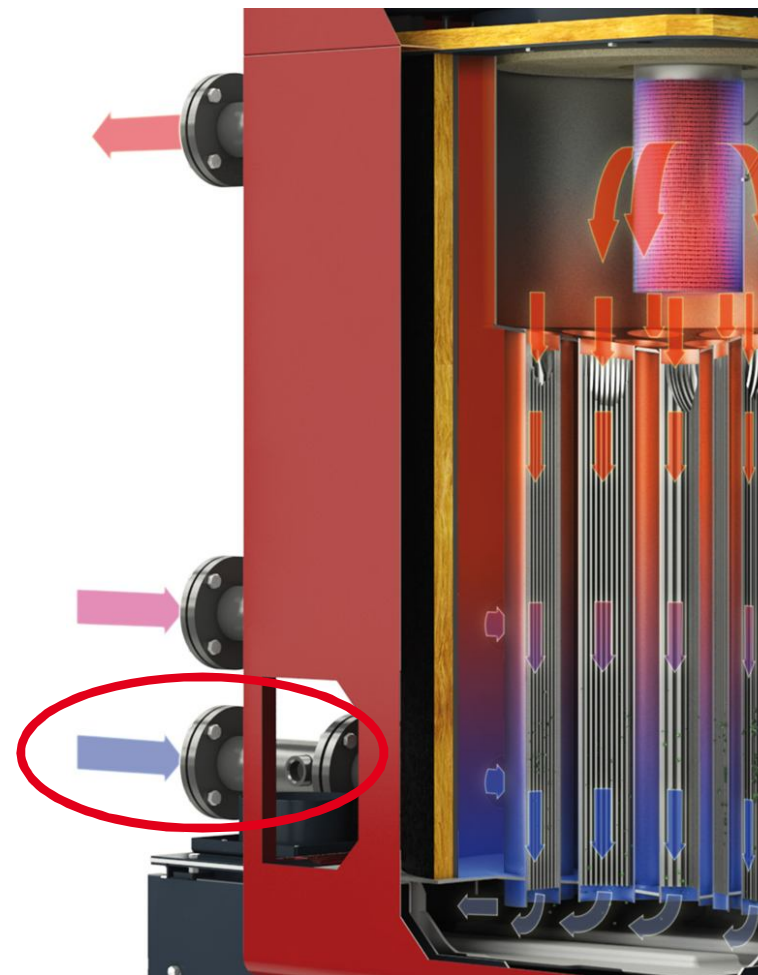
UltraGas boiler: 6% gain in comparison
to standard boiler, due to two returns

Hoval

Standard boiler, $\eta = 86\%$



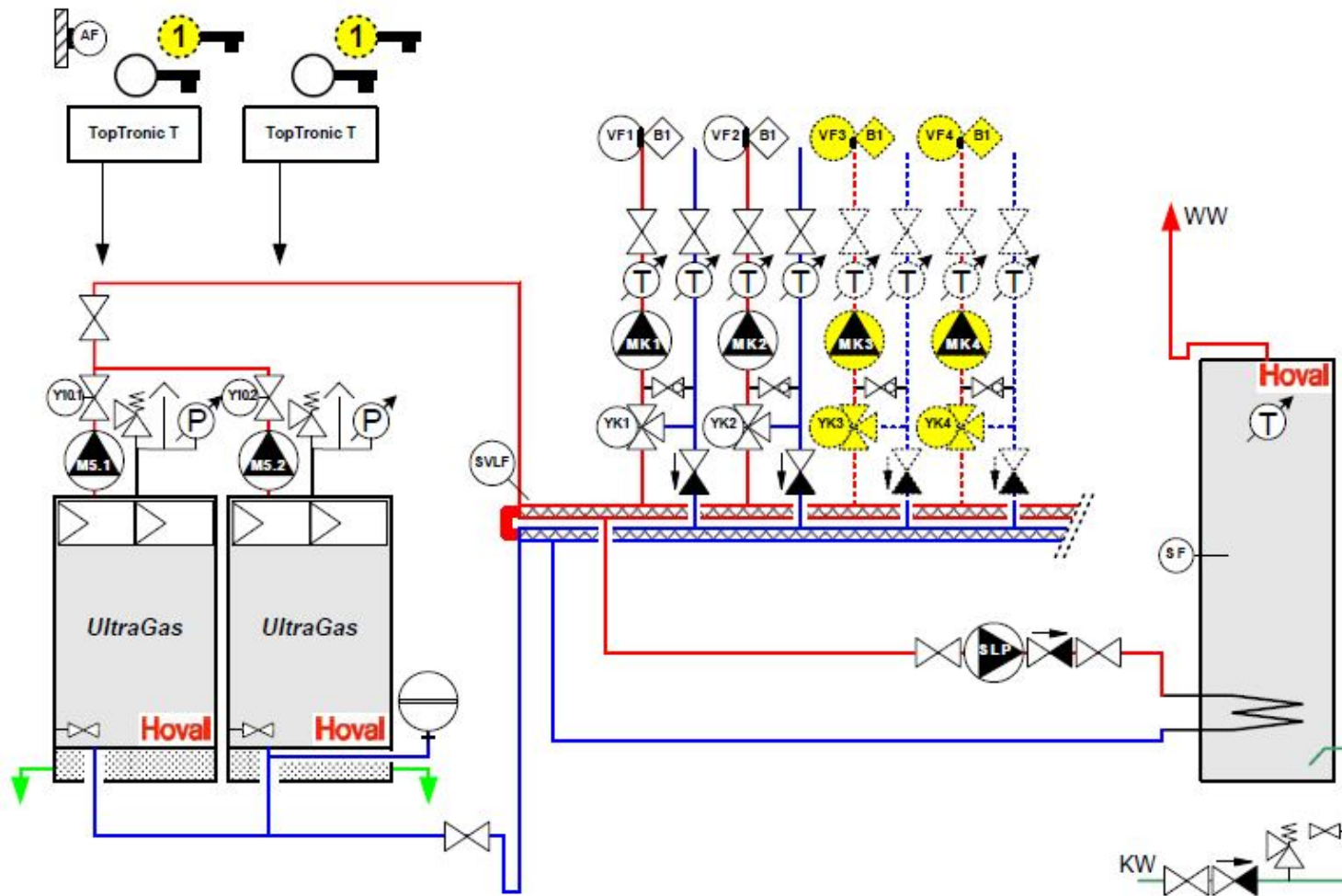
UltraGas[®] boiler, $\eta = 92\%$



BCTT030

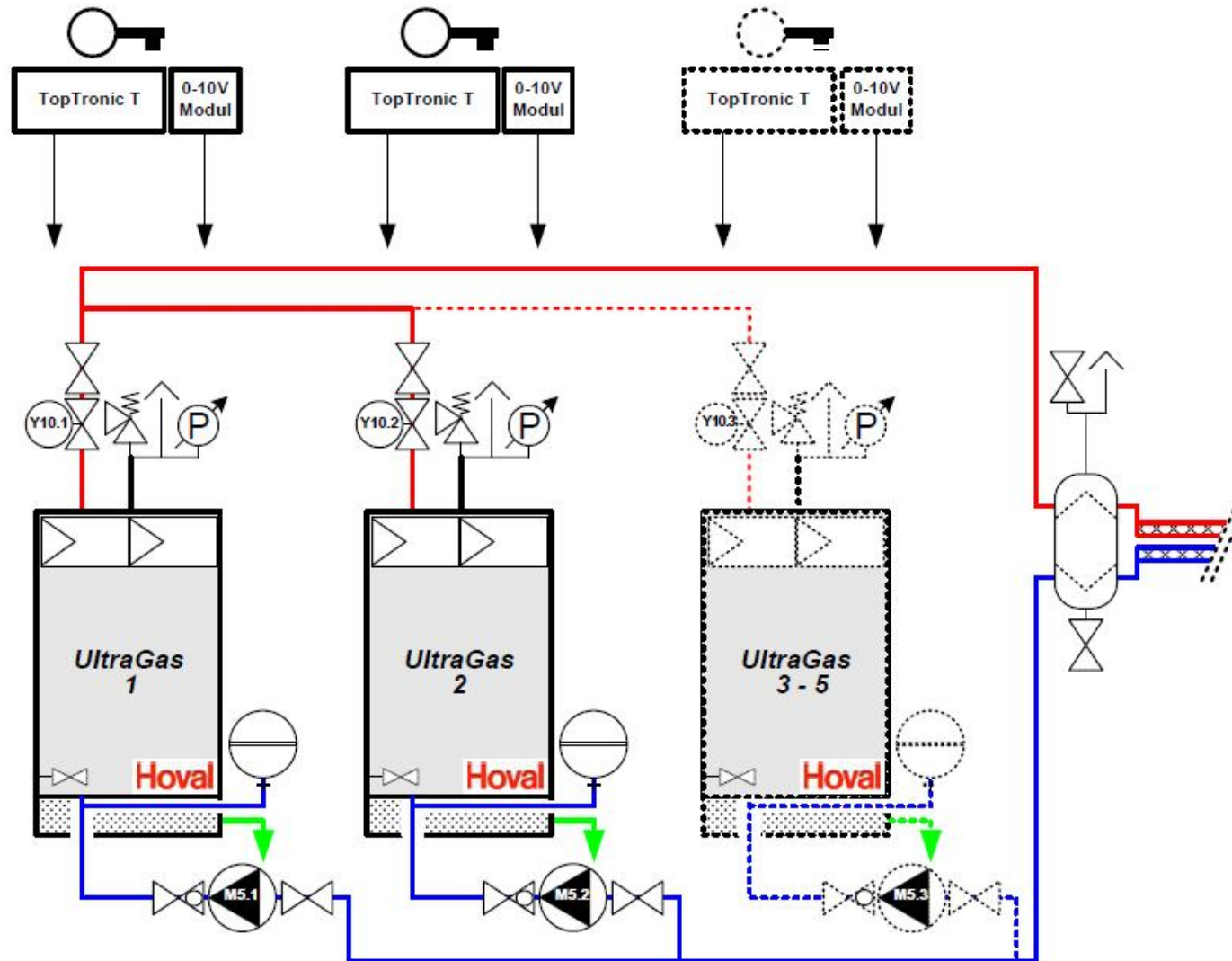
Low temperature heating circuit

Hoval



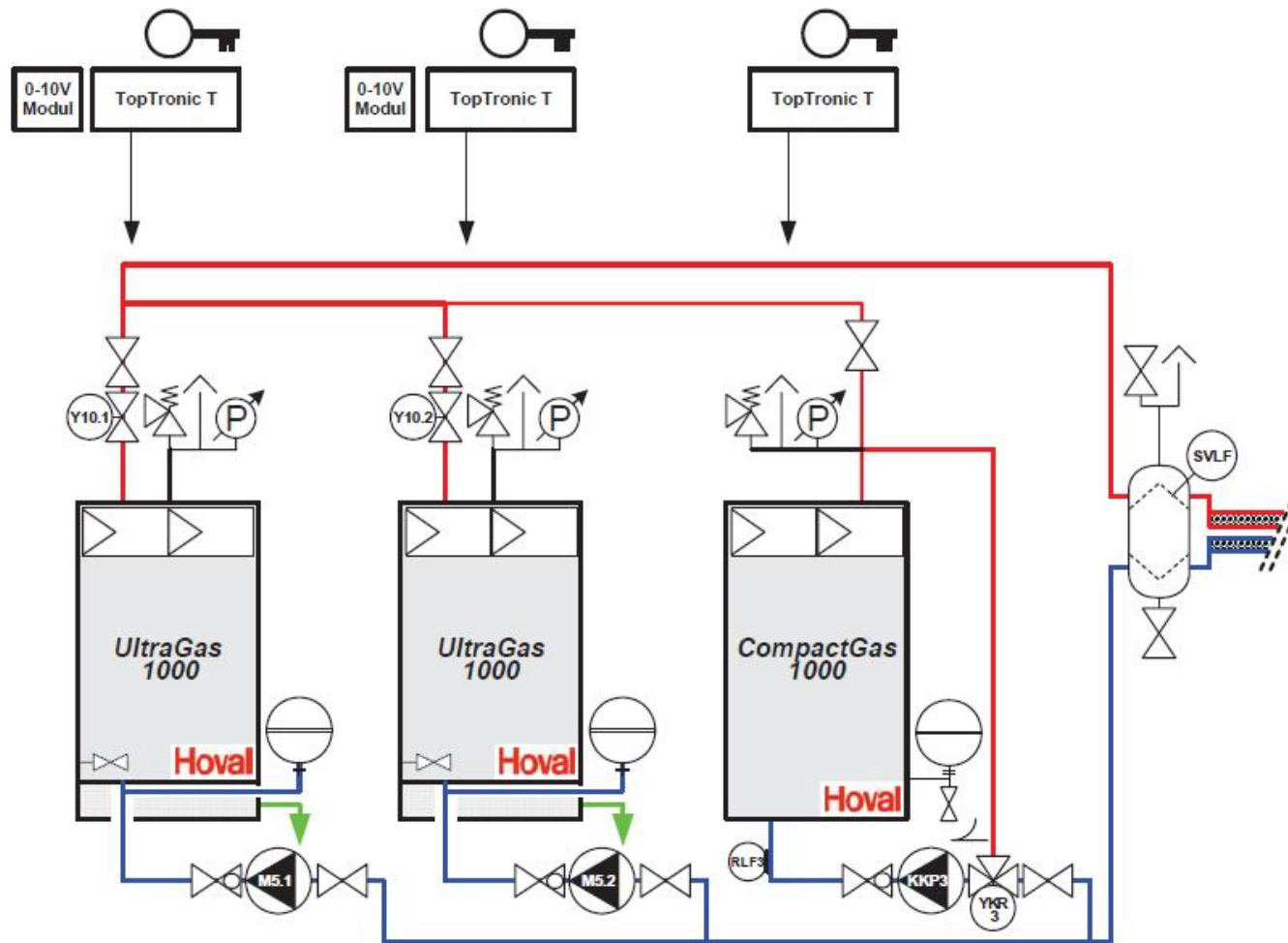
KBC030

Hoval



Hybrid System UltraGas - CompactGas

Hoval



Overview of product range

Hoval



UltraGas® (15 - 90)

Innovative condensation design for single family homes and small multiple occupancies.

UltraGas® (125 - 2000D)

Space savings even with top performance models.

Office complex VP Bank, Vaduz, LI

Hoval

Hoval equipment installed:

- 2 fully condensing hot water boilers type UltraGas® (500D) with each 250 kW Hoval
- UltraGas® advantages at a glance:
- aluFer heat exchanger technology (Hoval patented) which provides maximum efficiency
- clean premix burner technology Hoval UltraClean® which provides lowest emissions
- low electrical power consumption and low noise in operation
- trend setting control's



Overview of the advantages

Hoval



Cost effectiveness

Patented
aluFer[®] heat
exchanger



Enviromental-friendly

Low emissions due to
Ultraclean[®]
combustion



Easy to use

Simple maintenance



Clever

Flexible use,
ideal for retrofit

Cost effectiveness

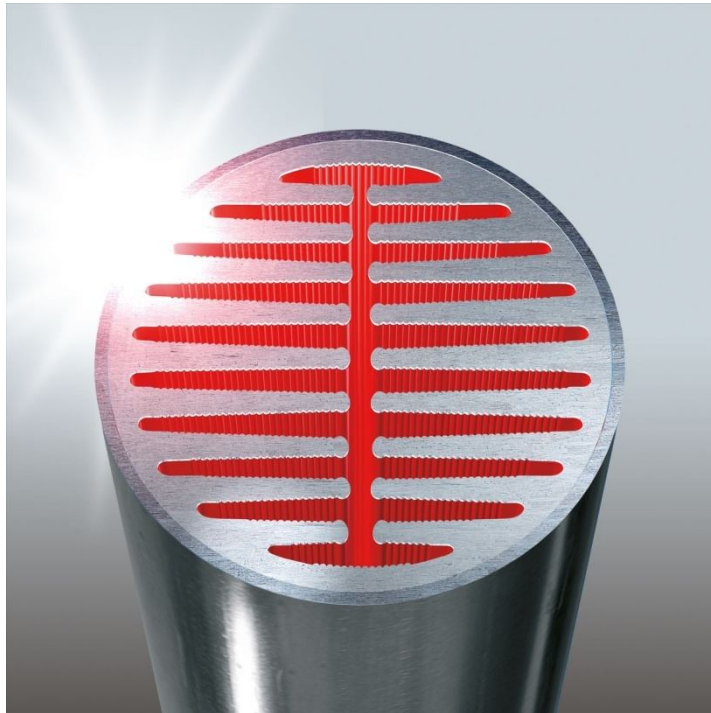
Hoval



- Highest efficiency due to **condensing technology with patented aluFer[®]** heat exchanger
- Additional **6 % energy savings** due to **separate high- and low-temperature returns** in combination **with unique boiler design** (high water content)
- The modulating burner technology assured always the **best boiler operating point**

Patented aluFer® heat exchanger

Hoval



- aluFer® heat exchanger means **10 to 20 % energy recovery**
- Special fin design causes **five times larger surface** for heat transmission
- **Inside aluminium** and **stainless steel outside** – optimise the heat transfer because of the high thermal conductivity

UltraGas®

Weights – Water content - Resistance

Hoval

UltraGas® Type	Total [kg]	Heat exchanger [kg]	aluFer® tubes [kg]	Water content [Liter]	Flow resistance Delta T 20K [mbar]
UltraGas® (125)	358	254	98	206	2.5
UltraGas® (150)	358	254	121	194	3.5
UltraGas® (200)	611	472	167	359	5
UltraGas® (250)	611	472	201	341	7
UltraGas® (300)	611	472	247	318	9
UltraGas® (350)	851	651	293	428	3.5
UltraGas® (400)	851	651	328	411	4
UltraGas® (450)	851	651	374	387	5
UltraGas® (500)	851	651	397	375	5.5
UltraGas® (575)	1277	1032	495	549	3.5
UltraGas® (650)	1277	1032	529	529	4.5
UltraGas® (720)	1277	1032	627	478	5
UltraGas® (850)	1712	1321	725	860	7
UltraGas® (1000)	1879	1428	840	739	9



Cost effectiveness

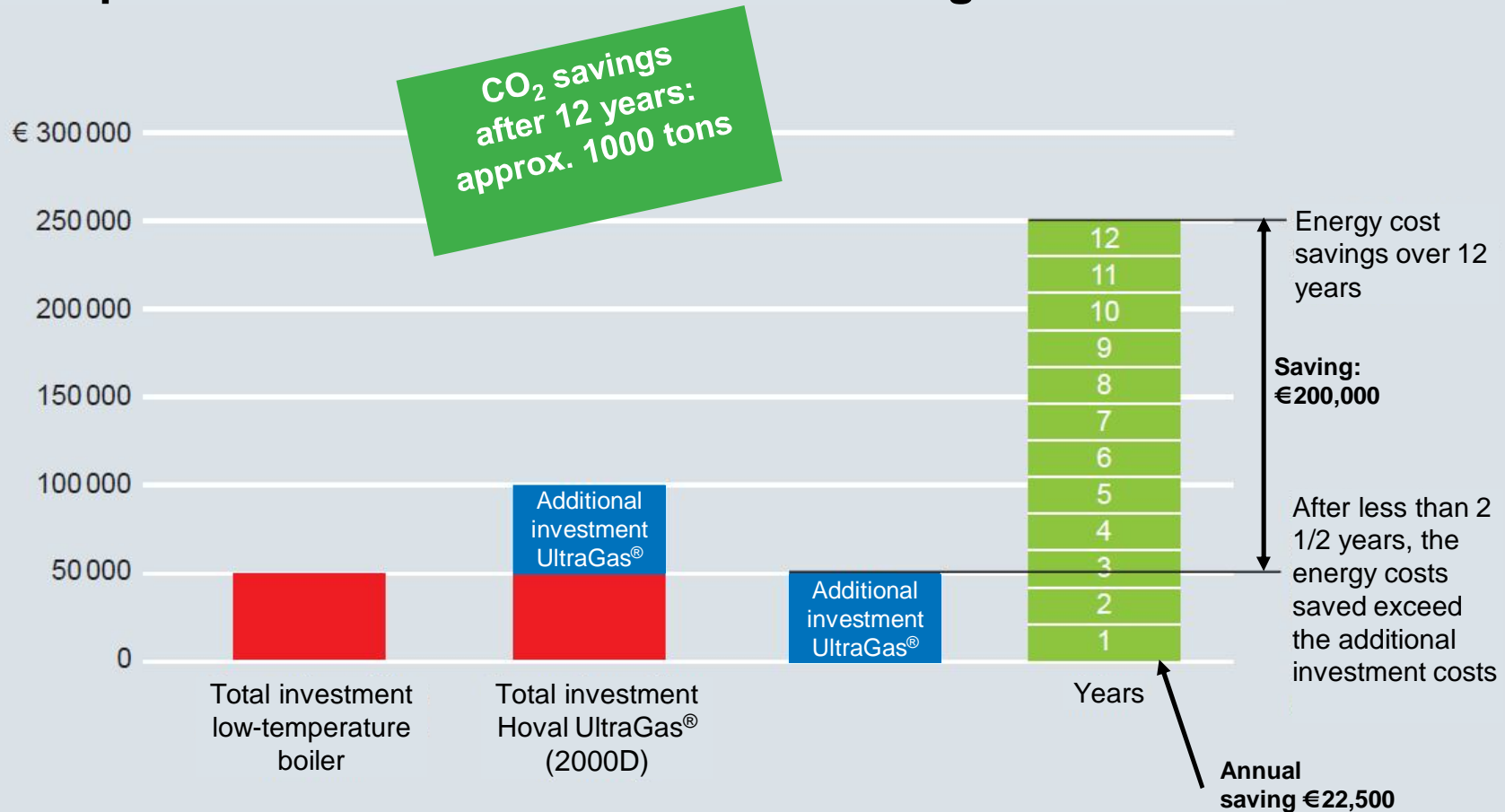
Hoval

Calculation of cost effectiveness

Example UltraGas® (2000D)

Hoval

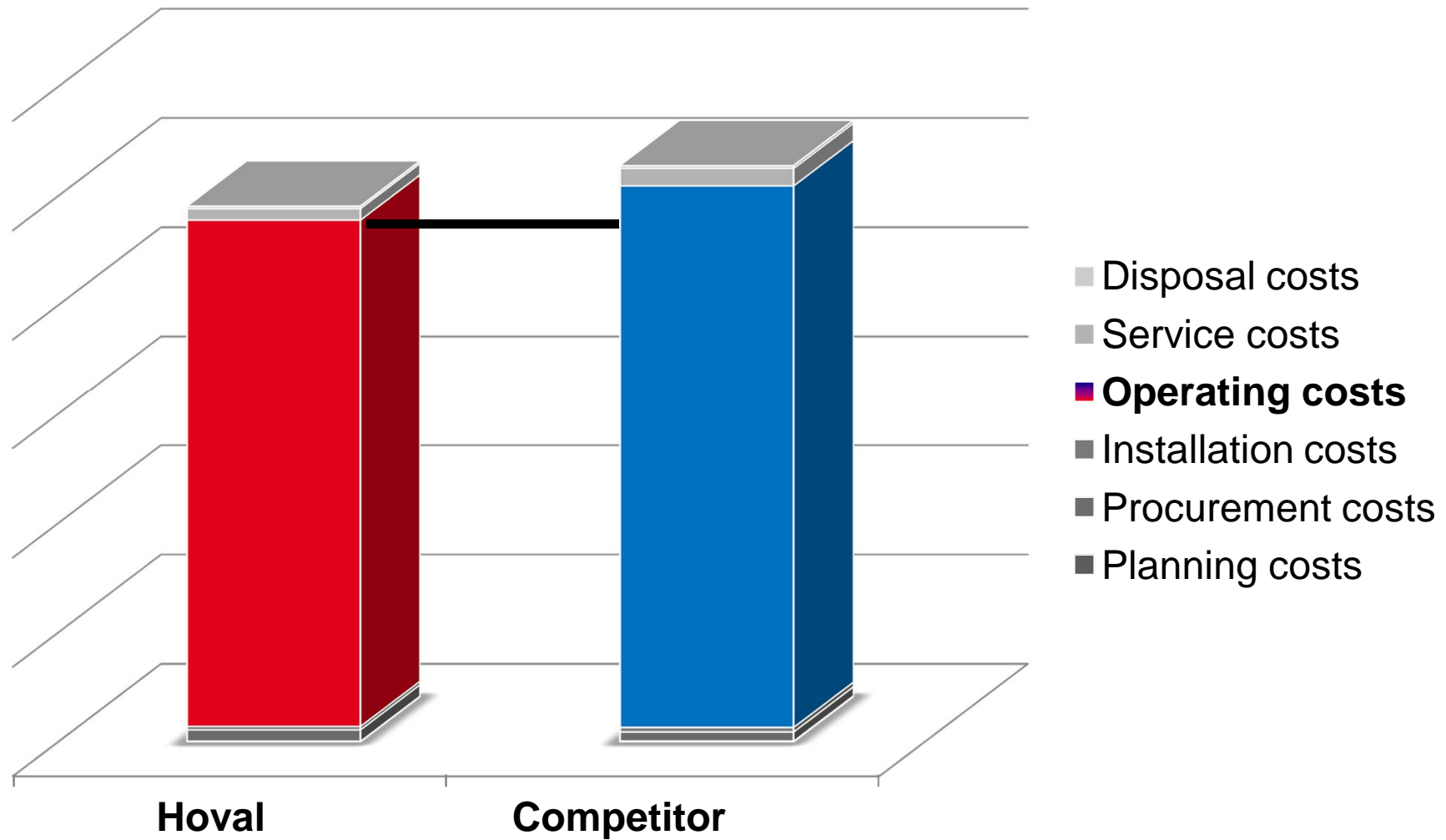
Comparison: UltraGas to a non condensing boiler



Calculation basis: Annual gas consumption: approx. 370,000 m³, gas price: 0.5 €/m³

Best Cost of Ownership

Hoval



Back



- **Saving of fuel costs with UltraGas®:**

- Big heating surface
- High- and low temperature return
- Big modulating power range
- Special control strategie for cascade
- Minimum stand by losses



- **Saving electricity costs with UltraGas®:**

- Minimum electricity consumption of the burner fan
- No internal boiler pump for a single boiler and a double boiler

Return of investment (ROI) realized plant in Italy

Hoval

School buildings: J.F. Kennedy und M. Grigoletti

Old plant:

Hot water boiler: 3 x 1600 kW
Fuel: Heating oil
Annual fuel consumption: 450.000 kg

New plant:

Gas-condensing boiler: 3 x UltraGas® (2000D): 6000 kW



Investment costs (boiler + heating room)

ca. 1.000.000 €

Annual saving of operation costs with UltraGas® :

270.000 €

ROI:

Cost savings after 20 years

aprox. 4 years
ca. 4.000.000 €

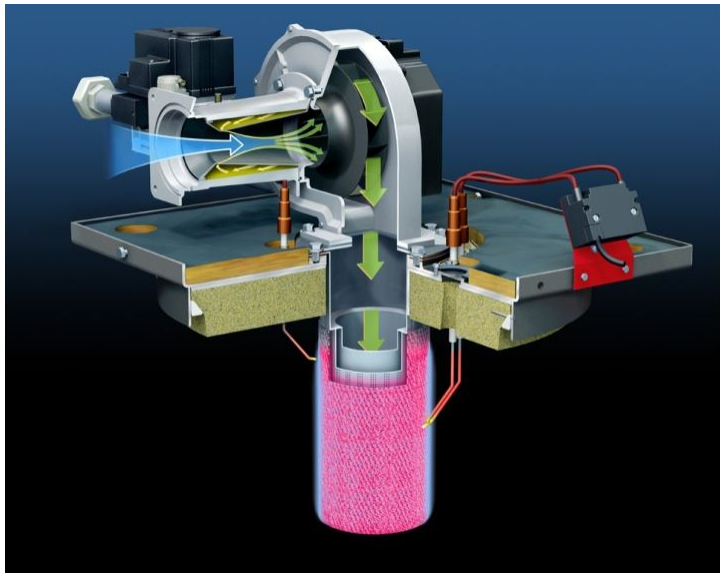
Eco-audit (CO₂ –savings)
After 20 years

102 t/a
2562 t



Low-emission as a result of Ultraclean® combustion system

- **Clean combustion** through premix burner with patented Ultraclean®
- **Low CO₂ emissions** due to minimal consumption
- **Low start / stop emissions** because of the **low number of burner starts**



- UltraGas® with its modulating burner continuously adjusts the output to the current heat demand.
- The result is:
 - fewer energy consumption
 - reducing of burner starts
 - greater efficiency
 - significantly lower emissions.



Environment protection

Hoval

Emissions reduction with UltraGas® :

- **Reduction of CO₂ Emissionen:**

- through reduction of the fuel consumption
- through reduction of electricity consumption

- **Minimum NO_x – und CO – Emissions**

- Top premix burner
- Big modulation range (significant reduction of the burner starts)



Easy to use

Hoval



- **Maintenance-friendly** through intelligent design details
- **Easy to clean**
- **Operator-friendly control** with TopTronic®T
- **Convenient remote maintenance** via TopTronic® online

Clever

Hoval



Flexible use, ideal for retrofit

- **Small foot print**
- **Quick installation** with flexible connection options
- **Easy to implement in existing applications**
- **Easy to realise boiler cascades**

The development of UltraGas®

Hoval



1989



2011

1985: Thermomax - burner (Gas premix burner)

Hoval sign with Ruhrgas (Germany)
a secret agreement over the special burner

1989: The first UltraGas®

At 3th April 1989 the UltraGas name was mentioned the first time !

Boiler design: Combustion chamber made of stainless steel
and a sepearte heat exchanger made of aluminium

Burner: Premix burner (System Ruhrgas)

November 1989: First registration for UG-C (20, 30)



1990: First redesign in Februar 1990

The UltraGas® serie increase in the middle of 1990:

With the type UGC (40) and UGC (12)

1992: Further increase o the UltraGas® serie

With the type UGC (50) and UGC (60)



1993: Development of the new heat exchanger (aluFer)

Our target was to develop a heat exchanger with a **big water content** and **no aluminium on the water side**.

The result was the aluFer – tube !

1994: The first UltraGas® mit aluFer tubes was built.

In February 1994 the first boiler with aluFer – tubes was built !



The development of UltraGas®

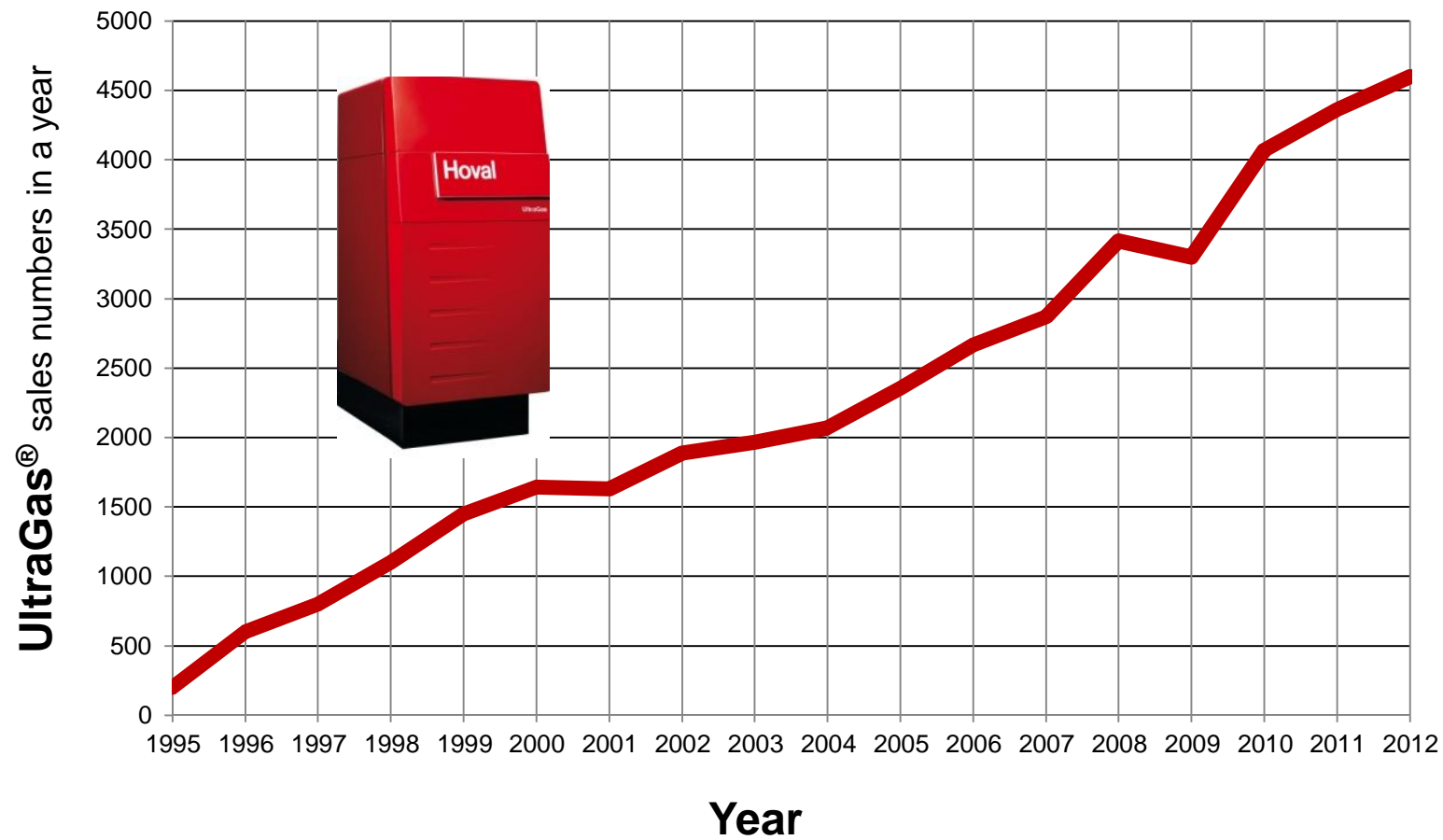
Hoval

**1995: Sales start of the first UltraGas with aluFer tubes
(UltraGas® A condens)**



The development of UltraGas®

Hoval



UltraGas® the best solution for your customer

Hoval

What are the requirements for a condensing boiler ?

- Top efficiency and cost effectiveness
- Minimum air pollution
- Quiet operation
- Compact design (small footprint)
- Simple hydraulik integration in the heating system
- Simple integration to the electrical control system

 **UltraGas®**





Reference installations

Hoval



2x UltraGas® (1440D) at Dental-Gruppe Ivoclar Vivadent
Vaduz, Liechtenstein

Reference installations

Hoval



4 UltraGas® (1000) at Flumroc (European leader in production of insulation materials in Flums, CH)

School building: J.F. Kennedy and M. Grigoletti (Italy)



Heating room with 3 x UltraGas® (2000D)



***** Kempinski Hotel Das Tirol (Kitzbühel)

Floor area (144 rooms): 20.600 m²

Wellness area: 3.600 m²

Boilers: 2 x UltraGas® (1000)

1 x CompactGas® (1000)



The highest building of the world: Burj Khalifa

Plant: **Burj Khalifa** (Burj Dubai)
Height 830 m, building costs 1 Mrd. €
517.240 m² floor area

Boilers: **9 x UltraGas® (300)** for domestic hot water

1 x UltraGas® (300) for kitchen

1 x UltraGas® (300) for laundry

Commissioning: October 2009





**Technologically superior
indoor climate control solutions**

Hoval

Thank you for your attention.