Condensing technology for added value when heating with oil

The ROTEX A1 oil condensing boiler delivers maximum efficiency with every type of heating oil. It is environmentally compatible, economical and prepared for bio-oil.

* ROTEX system consisting of:
  A1 BO 20-e, SCS 338/16/0-DB,
  RoCon control, 4 solar collectors V26P
Lower your consumption – the modern way

ROTEX oil condensing technology adds value
Selecting the right boiler for your oil heating system is a decision affecting the next 15 to 25 years. The fuel costs for your heating system over this time will be multiples of the initial investment. Fuel costs, therefore, offer you the greatest potential for savings. Only condensing technology achieves virtually complete energy utilisation. When replacing existing boilers, the ROTEX A1 achieves energy savings up to 40% thanks to its outstanding levels of efficiency. So that you can be sure that your investment will pay off, ROTEX also guarantees the boiler body for 15 years.

Saving is environmentally friendly
The ROTEX A1 defines the current state of the art in oil boiler technology. Minimal emissions, straightforward operation and maximum energy utilisation characterise the ROTEX A1 oil condensing boiler. The most advanced technology converts the fuel used into useful heat, with virtually no losses. This protects the environment and your wallet. Reduced energy consumption means not only lower heating bills, but also protection of energy resources and lower CO₂ emissions.

Be prepared for anything – ready for bio-oil
In future, an increasing proportion of bio-oil, or bio-oil constituents, will be added to conventional heating oil. The ROTEX A1 is already prepared for the combustion of all types of commercially available heating oil, including those with biogenic constituents. With the ROTEX A1, up to around 20% biogenic constituents (FAME) can be added to heating oil without impact on the operational safety, and without increased maintenance effort. The burner components have been developed to cope with the demands placed on them by bio-oil, in other words: ready for bio-oil.

ROTEX A1 – ideal as a replacement boiler in existing installations
The ROTEX A1 is ideal as a replacement for older boilers. Its excellent flexibility when updating existing systems, its light weight, compact dimensions make it the modernisation specialist.

„Our old oil fired heating system simply had to go. It didn’t take long for the new ROTEX oil condensing boiler to win us over though. It’s extremely economical, low maintenance and so flexible that it can even be combined with a solar thermal system. We added one right away and have made more savings than we ever thought possible.“
Antje and Stefan Ernst have owned their family home for 30 years
Efficiency made transparent

September 2015:
New: energy efficiency labels for heating systems
We’re familiar with these labels on fridges, televisions and other electrical appliances. From 26 September 2015, heat generators and water heaters will bear their own EU energy efficiency labels. These labels will make it easier to compare individual heating products and decide which ones to buy.

How the energy efficiency classes are determined
The product’s seasonal energy efficiency will determine its energy efficiency class. Put simply, this indicates the relationship between the total energy input and the useful heat output. The greater the proportion of renewable energy used to generate heat, the higher the efficiency class. As a result, heat pumps are usually in the top efficiency classes (A+ and above), followed by gas and oil condensing boilers, with conventional boilers bringing up the rear, as they tend to perform comparatively poorly against the relevant criteria.

Efficiency classes for products and systems
Individual heat generators will each bear a product label. The efficiency of a heating system depends not only on the heat generator, but on several components. That is why the combination or package label was introduced. This covers the heat generator plus other components such as the controller, cylinders, solar thermal systems and/or an additional heat generator. The combination label is calculated from the efficiency values of the individual appliances and devices.

Expert advice
Every building is different. Your choice of a new heating system, especially as part of modernisation, should not be based solely on the efficiency rating. Depending on the characteristics of your building, a heating system with a low efficiency rating may consume less energy than a system with a higher rating. Consequently it’s important to get expert advice and help with sizing: that’s where your ROTEX partner comes in useful.

Strong system solution: Oil condensing and solar

Excellent package label ratings
Hooking up a solar thermal system is the most effective way to reach a higher overall system efficiency class. The ROTEX Sanicube thermal store is already optimised for hooking up with a solar thermal system, and provides the ideal complement to the ROTEX A1. When linked up to a ROTEX Solaris, this system will become your own personal ‘solar heater’. The integral central heating backup and large storage volume will raise your system’s energy efficiency ratings for both domestic hot water and space heating.

Safe in the knowledge it’s ROTEX
All ROTEX products are tested and meet the criteria in the Eco-design Directive. For both individual products and packaged solutions, energy labels are a reliable indicator of efficiency class.

Perfectly matched in terms of their individual components, our complete systems provide both maximum convenience and the highest safety standards.

System diagram: A1 oil with thermal store and solar thermal

1. Oil condensing boiler with built-in electronic controller
2. Thermal store
3. Solar thermal collectors
4. Solar pump station

System efficiency with Solar:

- ROTEX system consisting of:
  - A1 BO 20-e
  - SCS 538/16/0-DJ
  - RoCon control
  - 4 solar collectors V26P

Product label
A1 BO 15-e

System efficiency with Solar:

- A
- A++
Quality is our patent remedy
The boiler body on the ROTEX A1 has been developed using entirely new, patented TWINTEC boiler technology. Advanced high performance materials were used throughout, rejecting materials suffering from corrosion entirely. The corrosion resistant stainless steel pipes which carry the heating water are directly cast into the boiler body, made of die-cast aluminium. The spherical shape of the boiler body, which is also patented, allows unrestricted condensing utilisation directly inside the boiler, without the need for an additional heat exchanger. That makes cleaning easy. The directly cooled combustion chamber also very effectively reduces the formation of nitrogen oxides (NOX).

Reduced water content for greater energy savings
When no heating is required, e.g. during the summer, your boiler runs exclusively to generate domestic hot water. The lower the weight and water content of the boiler, the less energy is required for heating. Consequently, less heat is wasted when reheating the DHW cylinder after completing the heating process. The ROTEX A1 has a very small water content (just 3 litres for the A1 BO 20-e) and thus suffers minimal cooldown losses.

A plastic pipe as a flue
As a result of the typically low flue gas temperatures involved in condensing utilisation, an economical flue pipe made of plastic is all the ROTEX A1 needs. This can be simply drawn into an existing installation shaft or an old chimney.

Excellent efficiency, prize-winning technology
ROTEX can draw on over 20 years of experience with oil condensing technology. The ROTEX A1 has been developed consistently over this period and many of its details have been optimised. This boiler has been awarded many international prizes over recent years, and deservedly so.
Advanced oil central heating

Everything under control
The digital RoCon controller meets the highest aspirations and is easy to operate. The display shows values and parameters in plain text. All operating modes and operating parameters can be set and modified easily and quickly. Important system parameters can be accessed and adapted to suit by your heating engineer. The heating water temperature is regulated subject to temperature. The controller automatically recognises summer and wintertime and switches the heating mode on and off to suit demand. It has individually adjustable timer programs for convenient control of the heating circuit and DHW generation, and can be supplemented by a room controller, which can be used conveniently to control and monitor the heating system.

Heating oil storage
In combination with the ROTEX variosafe double-walled heating oil tank, you can store oil directly adjacent to the boiler in the same room. This means that you can use your existing oil storage room for other purposes, e.g. as a hobby room, for a sauna, etc. In Germany, the Building Regulations (German State Fire Codes) permit heating oil storage of up to 5000 litres in the same room when the balanced flue ROTEX A1 oil condensing boiler is used with the ROTEX variosafe oil tank. And this is without walling off, or the use of an oil bund.

DHW at its hygienic best
The ROTEX Sanicube thermal store is an ideal supplement to the ROTEX A1 heating system. It had been conceived in accordance with the latest heating technology and water hygiene requirements. Its special design is tailored to provide the best possible water hygiene. Deposits of sludge, rust, sediments and even the growth of dangerous legionella bacteria, which can arise in large volume tanks, are prevented.

The hybrid control RoCon
It not only regulates the A1, but also manages heat store, the heart of the hybrid heating system. This overarching hybrid management system provides for the highest levels of system efficiency and optimum convenience for heating and domestic hot water. Straightforward and consistent handling of the ROTEX A1 – with intuitive menu navigation and control via your smartphone using the ROTEX App.

Heat from the sun
The straightforward ability to combine the ROTEX A1 with solar energy has already been taken into account at the development phase. The ROTEX Solaris system exploits free solar energy for DHW generation and central heating backup. When combined with the A1 oil condensing boiler, the ongoing energy costs can be reduced to approximately 51 % of those of a current standard heating system using a low temperature boiler.
Think DHW hygiene when buying a heating system

ROTEX Sanicube - the hygienic thermal store
The ROTEX thermal store is a combination of domestic hot water tank and instantaneous water heater. The heat is not stored in the domestic hot water itself, but in the clearly separated tank water. Optimum tank stratification ensures that the provision of hot water is always guaranteed.

The drinking water is contained in a high-performance heat exchanger made of durable stainless steel (INOX). Your drinking water remains perfectly hygienic.

The storage tank water is added at commissioning and serves only for thermal storage. It is not exchanged and consumed. The inner and outer walls are impact-resistant polypropylene, the space in-between is filled with highly heat insulating foam. This results in very good heat insulation values and minimum surface losses.

"When the hot water storage tank had to be replaced, I was amazed how much deposit had collected in the old unit. As a result, our installer recommended us the Sanicube from ROTEX. The water-hygiene advantages convinced me. I can now enjoy every drop again."

Sabine Hiller about her experiences using the Sanicube thermal store

Your benefits with the ROTEX Sanicube thermal store
Outstanding efficiency
• Efficient energy saving thanks to full thermal insulation made from PU rigid foam

Hygiene
• Highest level of hygiene by the separation of the storage tank water from the domestic water
• No deposits, no legionella generation

Meets your needs
• Minimum space requirement and simple installation due to compact design and low weight
• Long-life and safe as a result of the used materials plastic and stainless steel
• Low scaling
• Sophisticated innovative technology, with 25 years’ experience
• Modular system: Interconnection of several storage tanks possible for high-volume hot water demand
• Connection to the most varied of heat generators and heat sources

The first thing we need for foodstuffs is clean water
The hygienic thermal store principle:
The domestic water to be heated is conveyed and heated through a separate high-performance heat exchanger made of stainless steel. Water that is charged first is also the first to be removed (first-in first-out principle).
A perfect combination: condensing + solar

Sunny outlook
ROTEX Solaris utilises free solar energy to back up the heating system. High performance solar collectors developed and produced in-house at ROTEX can be installed in a variety of ways and offer the highest levels of energy efficiency.

Low expenditure – high yield
At peak levels, 80% of the solar energy that has been captured can be converted into usable heat. The high efficiency of ROTEX flat-plate collectors makes this possible. Solar energy and the A1 oil condensing boiler complement each other perfectly. Depending on demand, the condensing boiler contributes the necessary amount of heat to the heating system.

Stock up on solar energy with the ROTEX thermal store
ROTEX Solaris uses solar energy for domestic hot water heating and provides effective backup for central heating. Alongside solar DHW heating, solar central heating backup is integrated ready for connection on the Sanicube with 500-litre tank capacity. If heat from the sun is not employed immediately, the ROTEX thermal store can store large amounts of solar energy. Heat for DHW or central heating can be used more than a day later.

Your benefits with the ROTEX Solaris solar system
• Efficient utilisation of free solar energy for hot water and heating
• Hygienic hot water generation
• Optimum temperature stratification in the ROTEX solar thermal store increases solar use
• Perfect incorporation with the most varied of heating systems

Solar systems by ROTEX

ROTEX Solaris: 2 possibilities - always the first choice
ROTEX Solaris is available in two different variants, that meet all structural conditions and individual requirements.

1. The pressurised solar system (Solaris-P)
The pressurised solar system impresses with its simple installation and is suitable for all applications and buildings. It operates efficiently and safely at any desired length of pipes and feed height. The well-engineered structure of the ROTEX solar thermal store means that an additional plate heat exchanger is not required. A bivalency heat exchanger for pressurised solar or other heat sources is already incorporated. That makes the system simple and flexible.

2. The direct Drain-Back system (Solaris-DB)
If the constructional conditions permit, we recommend the unpressurised and direct Drain-Back system. The water in the store is supplied directly and without heat exchanger to the solar panels, heated and then stratified into the store. This considerably increases the efficiency of the solar collectors and the entire utilisation of the installation. Since the system is unpressurised, components which would otherwise be required are not necessary, such as the expansion tank, pressure relief valve, pressure gauge and heat exchanger.

The Solaris solar panels are only filled if there is enough heat from the sun and if the thermal store can absorb heat. The fully-automatic control system controls the system independently to provide optimum utilisation of the solar energy. If the sunshine is insufficient, or if the solar thermal store does not need any more heat, the feed pump switches off and the entire solar system drains into the thermal store. The addition of antifreeze agents is not required since the panel surface is not filled with water when the system is not operating. This is a further plus from the environmental perspective. The principle functions only if the connection pipes in the building and on the roof are installed with a constant gradient. If this is not possible, the pressurised solar system is the optimum alternative.

ROTEX Solaris panels - flexible assembly
The Solaris solar panels convert almost all of the shortwave solar radiation into heat through their highly selective coating. The three different solar panel sizes mean there is flexibility in adapting to roof characteristics. Since all buildings are different, there are various installation options for fitting the ROTEX flat solar panels onto the roof. The solar panels can be fitted onto the tiles (on-roof), into the roof (in-roof) or also with a special substructure onto a flat roof.

Monthly energy consumption of an average single-family house
The diagram shows the monthly energy consumption of an average single-family home. It compares two system types:
• The white bar represents the energy consumption using an old boiler.
• The grey/yellow bar shows a system with the ROTEX A1 with 4 solar panels.

- Old system
- Condensing boiler
- Use of solar energy
Technical Data

**System efficiency with Solar**
* ROTEX system consisting of A1 BO 20-e, SCS 538/16/DB, RoCon control, 4 solar collectors XLP

**Oil condensing boiler**

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>Energy efficiency class</strong></td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
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<tr>
<td><strong>Space heating (flow temperature 55 °C)</strong></td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
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<tr>
<td><strong>Space heating with integrated cold water heater</strong></td>
<td>A</td>
<td>A</td>
<td>A</td>
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</table>

**Key details**

| Rated output to DIN-EN 303 (kW) | 15 | 20 | 24 | 34 |
| Total charged weight (kg) | 588 | 594 | 357 | 593 |
| Empty weight (kg) | 88 | 94 | 57 | 93 |
| Water contents (litres) | 3 | 3 | 4.5 | 5 |
| Dimensions (W x D x H) (mm) | 790 x 790 x 1658 | 790 x 790 x 1658 | 595 x 615 x 1646 | 790 x 790 x 1658 |
| Flue gas/air intake connection | 80/125 \( \times \) 80/125 | 80/125 \( \times \) 80/125 | 80/125 \( \times \) 80/125 | 80/125 \( \times \) 80/125 |
| Controller | RoCon B1 | RoCon B1 | RoCon B1 | RoCon B1 |

**Solar flat solar panels**

<table>
<thead>
<tr>
<th>Model</th>
<th>V 21 P</th>
<th>V 26 P</th>
<th>H 26 P</th>
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<tbody>
<tr>
<td>Dimensions (W x D x H) (mm)</td>
<td>1000 x 65 x 2000</td>
<td>1300 x 65 x 2000</td>
<td>2000 x 45 x 100</td>
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<tr>
<td>Gross surface area (m²)</td>
<td>1.5</td>
<td>2.0</td>
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<tr>
<td>Water content (litres)</td>
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<td>1.7</td>
<td>2</td>
</tr>
<tr>
<td>Dimensions (W x D x H) (mm)</td>
<td>780 x 1340 x 1500</td>
<td>780 x 1380 x 1500</td>
<td>780 x 1380 x 1500</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>39</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>Manufacturer’s guarantee</td>
<td>15 years</td>
<td>15 years</td>
<td>15 years</td>
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<tr>
<td>Safety oil tank**</td>
<td>vsf 1500</td>
<td>vsf 1000</td>
<td>vsf 750</td>
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<tr>
<td>Storage capacity (litres)</td>
<td>1500 - 7500</td>
<td>1000 - 10000</td>
<td>750 - 7500</td>
</tr>
<tr>
<td>Overall height (mm)</td>
<td>1500</td>
<td>1700</td>
<td>750</td>
</tr>
<tr>
<td>Dimensions (W x D x H) (mm)</td>
<td>780 x 1340 x 1500</td>
<td>780 x 1380 x 1500</td>
<td>780 x 1380 x 1500</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>39</td>
<td>29</td>
<td>29</td>
</tr>
</tbody>
</table>

**Accessories can be found in the current ROTEX pricelist. Please check with your heating contractor. Information in printed materials subject to correction and technical modification. From 26 September 2015, energy efficiency labels and current product datasheets can be obtained using the Energy Label Generator at www.rotex-heating.com.**
What makes ROTEX different?
We offer individual solutions for optimum living and working that are straightforward, intelligent, and futureproof.

ROTEX is a manufacturer and supplier of complete innovative and environmentally responsible heating systems – building on decades of experience. Since 1973, ROTEX has stood for innovation and know-how in the field of heat generation, storage and distribution. In the development of products for our high grade and perfectly matched components we focus on user benefits.

The ROTEX product range extends from heat pumps, condensing boilers for oil and gas, solar thermal systems and thermal stores, not forgetting underfloor heating, heating oil tanks and rainwater tanks, right up to a comprehensive installation system for all sanitary and heating equipment. Innovative systems that facilitate the optimum use of conventional and alternative fuel types in both modernisation and new build projects. ROTEX products stand for unique cost efficiency with maximum environmental compatibility and the highest levels of flexibility.

ROTEX Heating Systems GmbH is a wholly owned subsidiary of Daikin Europe NV, making it a member of the DAIKIN Group, the world's leading manufacturer and supplier of products for heating, ventilation and climate control. Our combined competence generates optimum product solutions to meet the highest user aspirations.