

**DEFRO**  
heat



# PURE HEAT

electric boilers

catalogue 2021

## OUR HISTORY

DEFRO is a company with family traditions and decades of experience in processing of steel components. Currently DEFRO is an unparalleled Polish brand offering products across the Europe. We are one of the biggest employers in the region, who not only manufactures the equipment, but also has own laboratory and design office. Modern equipment resources with huge storage facilities are one of the successes of the company. DEFRO equipment not only achieves the highest quality and safety, but also meets the restrictive standards.

Currently, DEFRO includes the following brands:

- Defro Heat
- Defro Home
- Defro Air
- Defro Garden



Manufactured  
in Poland



**Robert Dziubela**  
CEO



**Hubert Dziubela**  
Member of the board



To address the expectations of our customers, we introduce new electric boilers to our offer - DBE OPTIMA.

Nowadays heating of the house is one of the key aspects of its operation and comfort of the residents. With development of modern processes, there is available more and more various types of supply for our homes with heat. Currently, this subject is so broad that choice of the suitable central heating system or upgrading of the already existing system is a great challenge for the user.

Considering the increasing consciousness of society with respect to comfort of use of the equipment intended for central heating, domestic heating water and environmental protection, more and more people decides to choose electrical heating.



## Green heat source

Such type of heating is the greenest and safest solution because there is no hazardous gases or flue gas polluting the ambient air.

There are many solutions using electrical heating available on the market, among which electric boiler is worth your attention. This is one of the cheapest solutions regarding investment costs because it does not require chimney or dedicated ventilation and costs of the boiler are low.

## Financing

Considering that you can count on financing from such programmes as “the Clean Air” or option to cooperate with photovoltaics systems, it makes that this solution is one of the most attractive.

Therefore, our company, based on long experience in the heating industry, decided to meet the expectations of customers and create the electric boiler ensuring reliable heating for many years



## PROS



The DBE OPTIMA electrical boiler is an advanced heating device, ensuring service-free and safe operation. Boiler operates without emission of flue gas, what makes it one of the safest equipment dedicated for the central heating or domestic heating water systems.

Does not emit any pollutants or gases hazardous to the environment. The assembly is relatively simple and does not require high financial efforts. The boiler can be operated as a primary heating source, particularly in homes with good thermal insulation and floor heating operating on low-temperature parameters and may become the best option to choose.

It may also be operated as a secondary heat source for solid fuel, condensing boiler, fireplace or even heat pump in the more severe winter conditions. Boiler efficiency (99.5%) allows quick obtaining of the required temperature in the room. Electric boilers from DEFRO are ideal solution for cooperation with PV system. The solutions implemented in the boilers allow increasing the auto-consumption level, what considerably shortens the return on investment time for the photovoltaic system.

Full control of boiler from the mobile app allows controlling the boiler functions from the smartphone.



## COMFORT

- Use of room controller ensures high comfort of use
- Optional control using the internet application (wifi module)
- Optional operation of dhw thanks to external package



## COMPATIBILITY

- Can operate as a main or alternative heat source cooperating with boiler fired with solid fuel, chimney, condensing boiler or heat pump
- Ease of replacement of solid fuel boiler at small amount of labour and money
- It is possible to adapt the boiler power to the demands



## ECOLOGY

- Ideal and cost-efficient solution for building with high-energy efficiency index
- Safe and green heat source - no noxious gases or flue gas is emitted by the equipment
- Cooperation with photovoltaic system



## ECONOMY

- Low investment costs because it is not necessary to construct a chimney, dedicated ventilation, gas service line or a place for fuel storage
- Investment costs can be further reduced due to funding from the Clean Air programme
- Weekly programmer helps to optimize the costs of energy



## QUALITY WARRANTY

- Due to reliable design and high quality of components the DBE Optima boiler can be reliably operated for many years
- All boilers are subject to complex quality control to maintain high standards

# COOPERATION

## We follow the trends

Growing popularity of the photovoltaics systems in Poland made that we are one of the leading countries on the European market. According to the latest report issued by the Institute for Renewable Energy, we occupy fourth positions in the UE in increase in new powers of the PV systems.

Majority of systems installed in the households operates in the on-grid mode what means that the connection with energy supplier is permanent and excess energy production is returned to the grid. Unfortunately, an energy seller collects a “commission” for storage. For systems not exceeding 10 kW it is 20% what practically means that we lose part of our energy and therefore return on investment time for our PV panels increases. Generally, it is almost impossible to use 100% of energy from photovoltaics systems.



# WITH PV SYSTEM

## Take full advantage of your PV system!

To change it and avoid losing 20% of our production, it is required to increase instantaneous consumption of electricity in our home. This can be achieved using e.g., electric boiler increasing the level of auto-consumption when it is used for heating purposes.

The Optima DBE boiler cooperates with PV system and connecting it with an invert what allows us increasing electricity consumption for the central heating or domestic heating water purposes when the production is at the highest levels, and programming system for energy consumption metering ensures additional control over the boiler and settings of the given kW values that should be used by the equipment. Our boilers are advanced, simple and comfort devices that may also be controlled using room controller or dedicated application. Boiler operation via the smartphone makes it very user-friendly.



## Take care of clean air

The governmental Clean Air programme has been launched to efficiently fight against the smog by decrease in the dust and pollution emission to the atmosphere and improvement of the energy efficiency and increase the proportion of use of the renewable energy sources in the single-family buildings.

The programme is planned to 2029 and it has a budget of 103 billion PLN.

The programme is aimed at the owners of the already existing buildings. The funding covers replacement of heat source and building energy retrofit.

Projects covered by funding:

- replacement of old, ineffective heat sources,
- purchase and installation of new heat sources,
- assembly and upgrade of central heating and domestic hot water systems,
- installation of mechanical ventilation with heat recovery,
- installation of renewable energy sources,
- replacement of window and door joinery.

Applications in electronic form can be submitted to the voivodeship funds for environmental protection and water management. More information about the programme is you may find on:

<https://czystepowietrze.gov.pl/>



# eModul APPLICATION



## Control the electric boiler as you want

Remote management of electric boiler operation becomes a standard solution because it is easy, convenient and ensures versatility and practicalness translating also into economical aspect of the heating system. The eModule app designed for remote management of heating and cooling has all of these features. Its versatility allows management of operation of various types of controllers. eModule can be used to control and edit operating parameters of the electric boiler.

## Mobile app for boiler control

The eModul application is an ideal solution for people living intensively, who often work during different hours and do not have time for household chores. It has been known for some time that edition of parameters of the heating equipment operation depending on your activities has a significant influence on decrease in the heating bills. Using this application you may perform the same operations both at home and in the office and all that is being done to achieve maximum comfort and efficiency of operation with the lowest possible energy consumption.

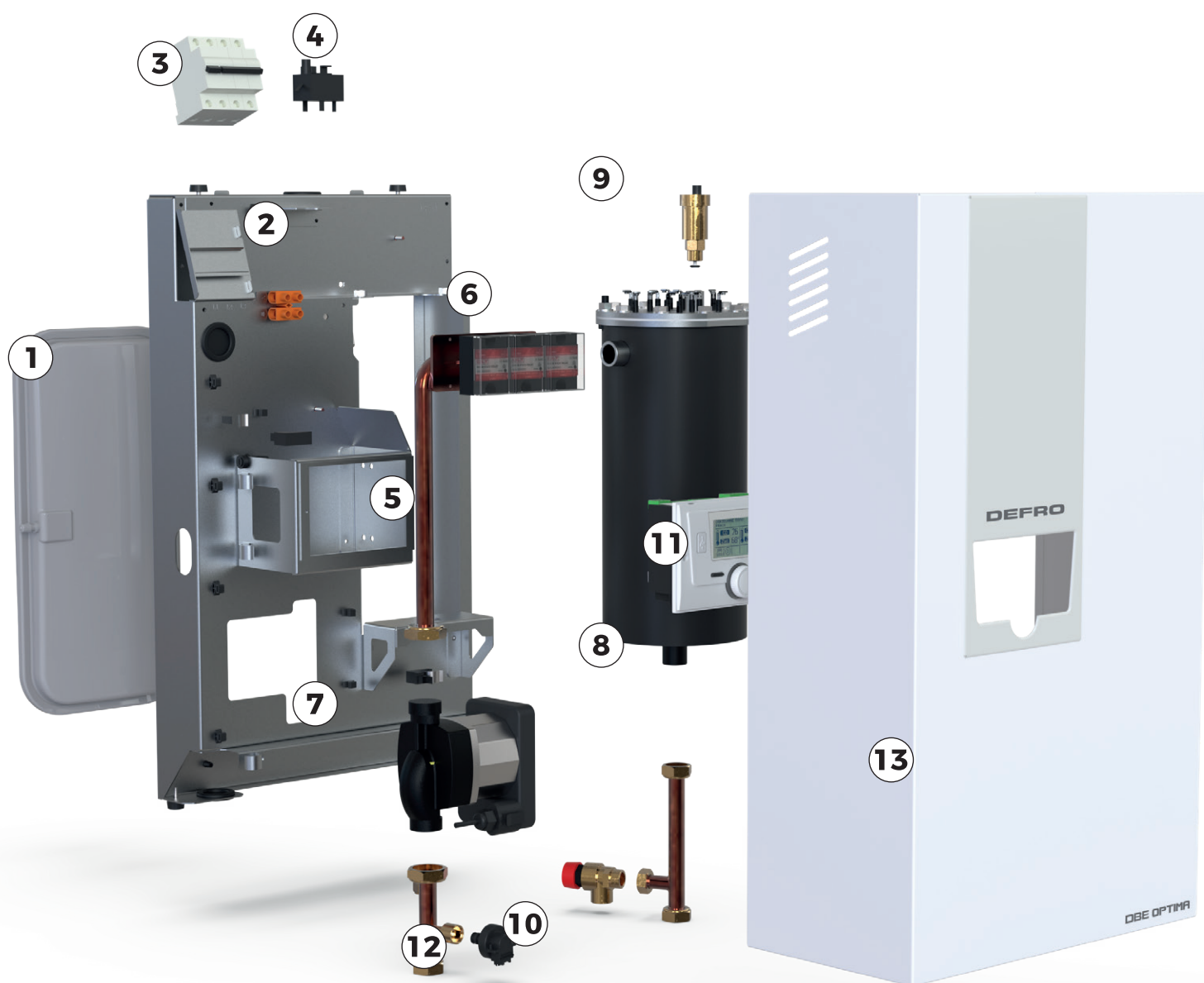
Using the schedules of equipment operation, you may change the temperature during the day in various time periods using your laptop, tablet or smartphone from anywhere in the world. Using eModul application, you may decrease the temperature if you forgot to do this before leaving to the work or going on holidays.



# TECHNOLOGY

1. Built-in expansion vessel
2. Mounting plate
3. Modular disconnecter
4. STB thermal protection of boiler
5. Copper connecting pipes
6. SSR relays
7. Circulating pump
8. Heat exchanger made of high-grade stainless steel
9. Automatic air-vent
10. Safety valve
11. Intuitive controller
12. Pressure switch
13. Housing protected with a durable powder paint





# ADVANTAGES OF DEFRO DBE OPTIMA BOILERS:

- safe and environmentally friendly
- daily-weekly boiler operation programmer
- optional Wifi control
- optional cooperation with dhw heat exchanger
- boiler operating range from 8 to 24kW
- cooperation with photovoltaic system
- servicing of mixing valve and additional central heating pump
- programmer for electricity consumption

- operation in opened and closed central heating systems
- ideal for operation with floor and radiator heating
- antifreeze system
- antistop system
- advanced system for boiler components cooling
- operating range from 5 to 80°C
- ideal for cooperation with other heat source (heat pump, gas boiler, solid-fuel and fireplace)

# CONTROLLERS



**i-2 Plus**

**Functions:**

- control of two mixing valves,
- control of DHW pump,
- option to control parameters of the heating equipment thanks to OpenTherm + communication in version 4.0,
- weather compensated control and weekly control,
- two configurable voltage-free outputs,
- two configurable voltage outputs,
- cooperation with two two-state room controllers,
- boiler co-operation with a room controller with RS communication,
- option to connect ST-505 or WIFI module,
- possibility of a software update via the USB port.



**i-3 Plus**

**Functions:**

- control of three mixing valves,
- control of DHW pump,
- two configurable outputs 0-10V,
- option to control parameters of the heating equipment thanks to OpenTherm + communication in version 4.0,
- weather compensated control and weekly control,
- two configurable voltage-free outputs,
- two configurable voltage outputs,
- cooperation with three two-state room controllers,
- boiler co-operation with a room controller with RS communication,
- option to connect ST-505 or WIFI module,
- possibility of a software update via the USB port.



**Wifi- DEFRO ST-5060 RS**

**Functions:**

- remote control of operation of pre-plumbed panels for thermostatic valves
- edition of set temperatures for each zone
- option to define weekly schedule
- preview of history of temperatures for each zone
- e-mail notifications about alarms and alerts
- version for mobile devices for download from Google Play



**ST-292 v3**

**Functions:**

- two-state regulator,
- room temperature control,
- weekly heating plan,
- day/night programme,
- manual programme,
- OptimumStart function - selection of optimum time for boiler start-up to achieve thermal comfort to heat the room up to the set temperature for a previously set time,
- heating/cooling function,
- momentary display backlight,
- built-in room sensor.



**ST-292 v2**

**Functions:**

- two-state regulator;
- wireless communication;
- room temperature control;
- weekly heating plan;
- day/night programme;
- manual programme;
- OptimumStart function - selection of optimum time for boiler start-up to achieve thermal comfort to heat the room up to the set temperature for a previously set time;
- heating/cooling function;
- momentary display backlight;
- built-in room sensor;



**ST-294 v2**

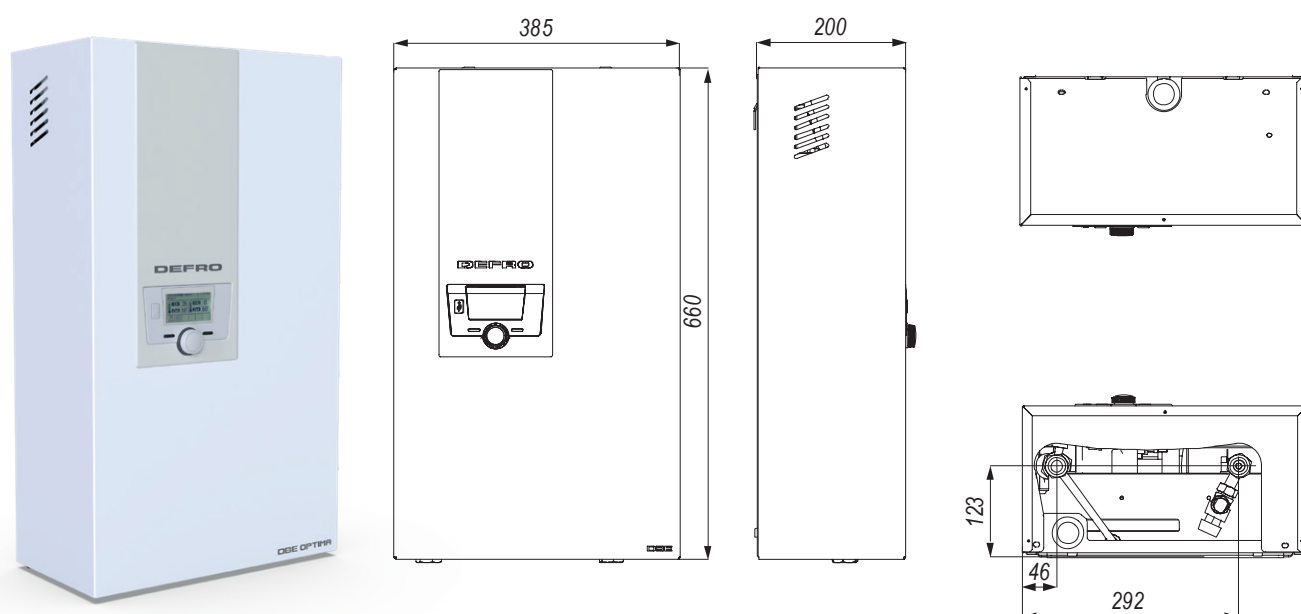
**Functions:**

- two-state regulator;
- control of room temperature +/- with 0.1 C deg. accuracy
- hysteresis
- wireless communication

# PRODUCT CODES

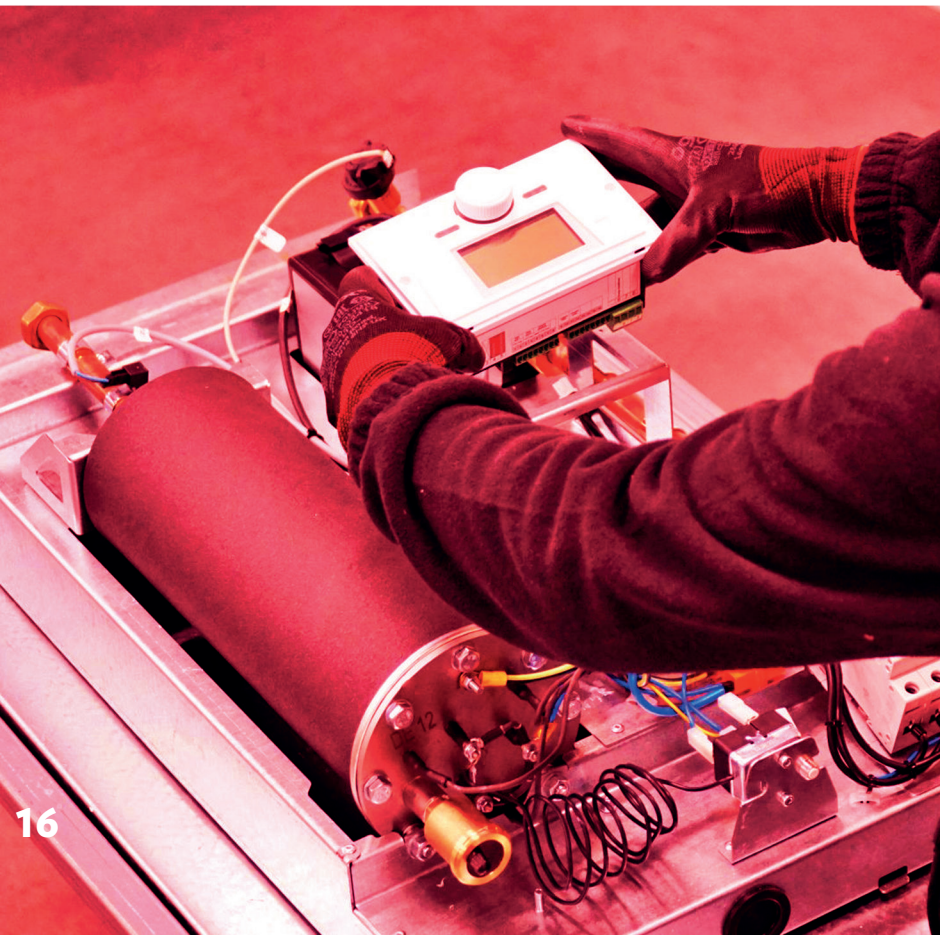
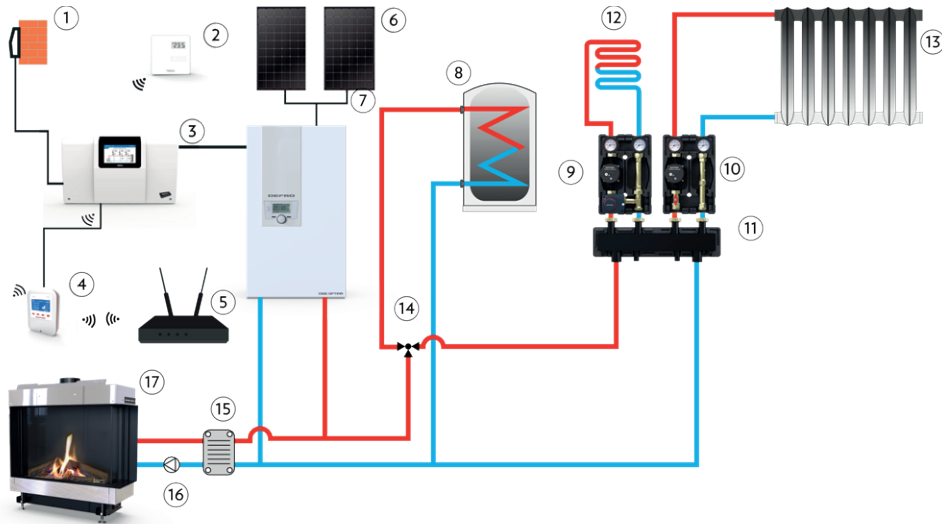
| Index       | Name                      | Description                                   |
|-------------|---------------------------|---|
| KCE-DBE-8   | Electric boiler DBE 8 kW  | DBE OPTIMA 2,7/5,4/8,1                        |
| KCE-DBE-12  | Electric boiler DBE 12 kW | DBE OPTIMA 4/8/12                             |
| KCE-DBE-16  | Electric boiler DBE 16 kW | DBE OPTIMA 5,4/10,8/16,2                      |
| KCE-DBE-24  | Electric boiler DBE 24 kW | DBE OPTIMA 8/16/24                            |
| E-ZRS-234-G | ZRS 234 valve             | Switching valve to dhw                        |
| WIFIRSINT   | Defro Controller WiFi RS  | Defro Controller WiFi RS                      |
| 557317      | Temperature sensor KTY    | Water temperature sensor in the dhw container |

# DIMENSIONS



# TECHNICAL DATA

| Parameter                                     | unit                 | DEFRO DBE OPTIMA  |              |               |               |
|---|----------------------|-------------------|--------------|---------------|---------------|
|   |                      | 2,7/5,4/8,1       | 4,0/8,0/12,0 | 5,4/10,8/16,2 | 8,0/16,0/24,0 |
| Rated power of one phase (single heater)      | kW                   | 2,7               | 4,0          | 5,4           | 8,0           |
| Rated power of three phases (all heaters)     | kW                   | 8,1               | 12,0         | 16,2          | 24,0          |
| Supply  | single-phase network | 1 × 230 V / 50 Hz |              | -             |               |
|   | three-phase network  | 3 × 400 V / 50 Hz |              |               |               |
| Fuses   | single-phase network | 1 × 40            | 1 × 63       | -             |               |
|   | three-phase network  | 3 × 16            | 3 × 20       | 3 × 25        | 3 × 40        |
| Nominal power consumption                     | single-phase network | 1 × 35,2          | 1 × 52,2     | -             |               |
|   | three-phase network  | 3 × 11,6          | 3 × 17,4     | 3 × 23,1      | 3 × 34,8      |
| Minimum cross-section                         | single-phase network | 3 × 10,0          | 3 × 10,0     | -             |               |
|   | three-phase network  | 5 × 2,5           | 5 × 4,0      | 5 × 4,0       | 5 × 10,0      |
| Nominal power consumption                     | A                    | 3 × 11,6          | 3 × 17,4     | 3 × 23,1      | 3 × 29,0      |
| Maximum allowable impedance of supply network | Ω                    | -                 | 0,27         | 0,27          | 0,13          |
| Max. permissible work pressure                | Mpa (bar)            | 0,15 (1,5)        |              |               |               |
| Capacity of diaphragm vessel                  | l                    | 6                 | 6            | 6             | 6             |
| STB setting                                   | °C                   | 90                |              |               |               |
| Setting of boiler safety valve                | Mpa (bar)            | 0,3 (3,0)         |              |               |               |
| Boiler weight                                 | kg                   | 27                | 27           | 28            | 28            |



## Boilers tailored to your needs

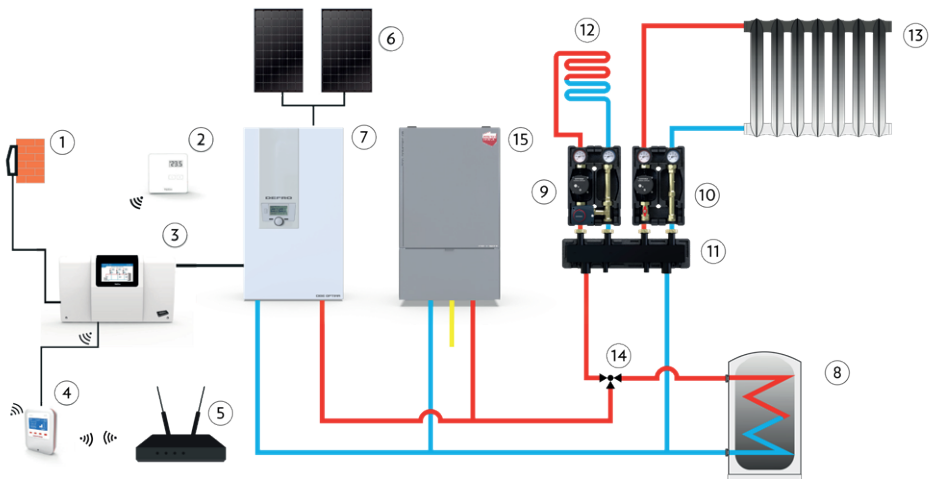
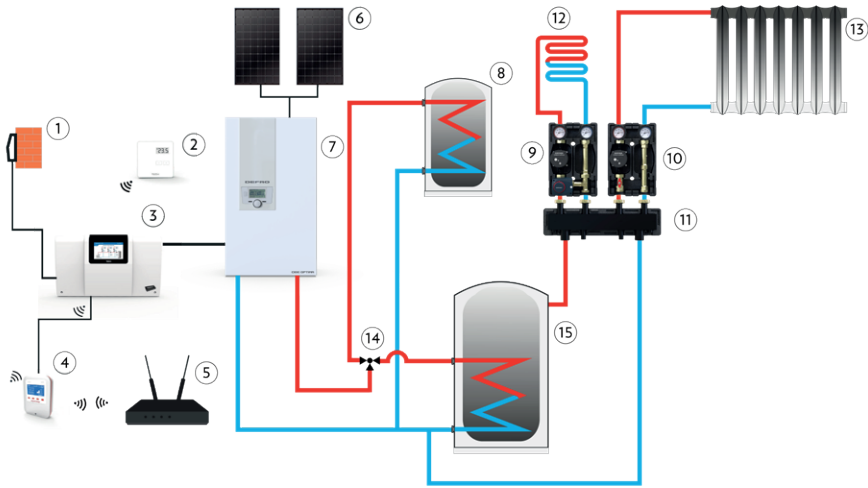
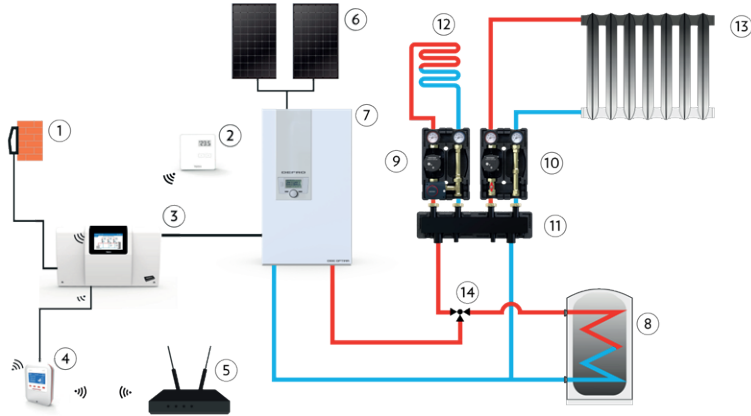
Can operate as a main or alternative heat source cooperating with boiler fired with solid fuel, chimney, condensing boiler or heat pump.

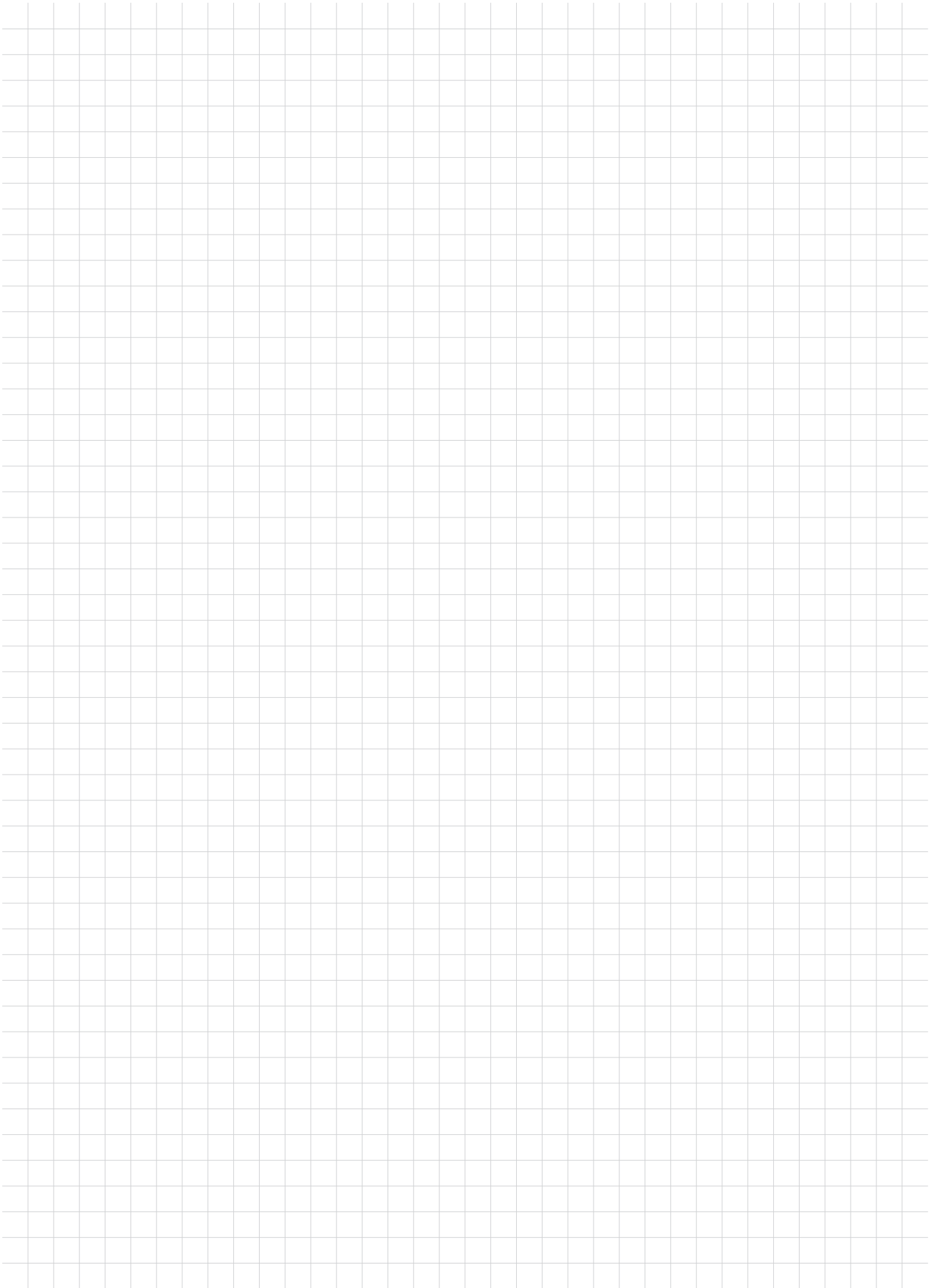
The wide range of boiler power easily allows adapting the boiler to our needs.

| Model           | Series of types (kW) |
|-----------------|----------------------|
| DBE OPTIMA 8kW  | 2,7/5,4/8,1          |
| DBE OPTIMA 12kW | 4/8/12               |
| DBE OPTIMA 16kW | 5,4/10,8/16,2        |
| DBE OPTIMA 24kW | 8/16/24              |



# EXEMPLARY DIAGRAMS







# CHECK OUR BRANDS

We invite you to check our offer.

## **DEFRO** heat

- Heat pumps
- Gas fired boilers
- Solid fuels fired boilers
- Piping components

## **DEFRO** home

- Fireplace inserts
- Gas fireplaces
- Dry stoves
- Accumulation

## **DEFRO** air

- Air handling units
- Air distribution systems

## **DEFRO** garden

- Garden barbecues
- Furnaces

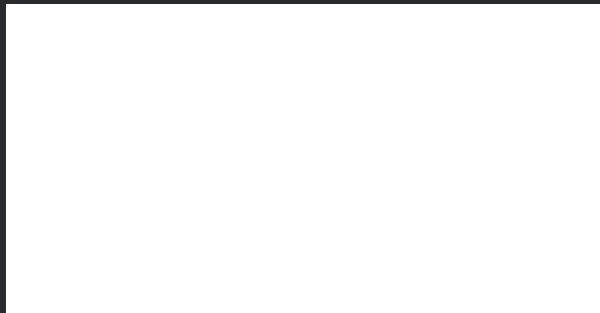


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