

# DEFRO<sup>®</sup>

heating technology

A series of horizontal stripes in red and grey, spanning the width of the page.

user manual

wall-mounted, condensing gas boiler

DEFRO DCG COMFORT 25

heat-only boiler – 1F ☐

combination boiler – 2F ☐

**DEKLARACJA ZGODNOŚCI WE  
DECLARATION OF CONFORMITY EC**

**no. 100/A-4/03/2021**

**DEFRO Spółka z ograniczoną odpowiedzialnością Spółka komandytowa**

00-403 Warszawa, ul. Solec 24/253  
Zakład produkcyjny:  
26-067 Strawczyn, Ruda Strawczyńska 103A

**DEKLARUJE / DECLARES**

z pełną odpowiedzialnością, że produkt / *with all responsibility, that the product*

**kocioł gazowy/ gas boiler  
(typ/type)**

**DEFRO DCG COMFORT 25 1F**

**DEFRO DCG COMFORT 25 2F**

**typ urządzenia: B23, B33, C13, C33, C43, C53, C63, C83, C93**

**został zaprojektowany, wyprodukowany i wprowadzony na rynek zgodnie z następującymi dyrektywami:**

*has been designed, manufactured and placed on the market in conformity with directives:*

**GAR 2016/426/EC**

**Boiler Efficiency Directive 92/42/EC**

**Electromagnetic Compatibility Directive 2014/30/EC**

**Low-voltage Directive 2014/35/EC**

**Ecodesign Directive 2009/125/EC**

**Energy Labelling Directive 2017/1369/EC**

**and the following harmonized standards:**

*and that the following relevant Standards:*

*PN-EN 15502-2-1+A1*

dokumentacja techniczna / technical documentation

**Wyrób oznaczono znakiem:**

*Product has been marked:*



Ta deklaracja zgodności traci swą ważność, jeżeli w urządzeniu wprowadzono zmiany, zostało przebudowane bez naszej zgody lub jest użytkowane niezgodnie z instrukcją obsługi. Niniejsza deklaracja musi być przekazana wraz z urządzeniem w przypadku odstąpienia własności innej osobie.

*This Declaration of Conformity becomes invalid if any changes have been made to the device, if its construction has been changed without our permission or if the device is used not in accordance with the operating manual. This Declaration shall be handed over to a new owner along with the title of ownership of the device.*

**Urządzenie jest wykonywane zgodnie z dokumentacją techniczną przechowywaną przez:**

*Device has been manufactured according to technical documentation kept by:*

**DEFRO Spółka z ograniczoną odpowiedzialnością Sp. k., Zakład produkcyjny: 26-067 Strawczyn, Ruda Strawczyńska 103a.**

**Imię i nazwisko osoby upoważnionej do przygotowania dokumentacji technicznej: Mariusz Dziubela**

*Name of the person authorized to compile the technical documentation: Mariusz Dziubela*

**Imię i nazwisko oraz podpis osoby upoważnionej do sporządzenia deklaracji zgodności w imieniu producenta: Robert Dziubela**

*Name and signature of the person authorized to compile a declaration of conformity on behalf of the manufacturer: Robert Dziubela*

**Dwie ostatnie cyfry roku, w którym oznakowanie zostało naniesione: 21**

*Two last digits of the year of marking: 21*

**Warszawa, 25.03.2021**

**miejsce i data wystawienia**

*place and date of issue.*

**Robert Dziubela**  
prezes zarządu / CEO

## Dear Customer,

We would like to inform you that we make every efforts to offer products of quality fulfilling the most restrictive standards and warranting operational safety. All devices are produced in accordance with the requirements of relevant EU directives and have CE safety mark confirmed by the Declaration of Conformity EC.



We appreciate all your comments and proposals regarding our level of service. We appreciate your comments and proposals regarding our devices and the level of service provided by our Partners and Technical Support and Service.

DEFRO Sp. z o.o. Sp. K

## Dear Customer,

We would like to thank you for choosing the high quality DEFRO product which will ensure your comfort and operational reliability.

As our customers, you can always count on the help of the DEFRO Service Centre, which is ready to ensure the continuous efficiency of your equipment.


Please note that in order to use the equipment safely and efficiently, it is crucial to get familiar with the following directions.


- ➔ Read and follow this Operating Manual - useful remarks concerning the proper operation of the equipment can be found there.
- ➔ Determine whether all parts have been delivered or the equipment has been not damaged during transport.
- ➔ Check data on the rating plate against the warranty card.
- ➔ Check whether connections to the system are in compliance with the recommendations of this manual and corresponding national regulations before the start-up.

Basic usage rules are to be obeyed while using the equipment. It is forbidden to remove the cover during the operation of the equipment.

DEFRO Service Centre or Authorized DEFRO Service should be always contacted when any intervention is necessary because only these parties have original spare parts and are properly trained within the scope of installation and operation of DEFRO boilers.

For your safety and equipment use convenience please get acquainted with this manual and send back the copy (scan or photo) of the correctly filled Warranty Card to the following address:

 DEFRO Sp. z o.o. Sp. k - Centrum Serwisowe  
Ruda Strawczyńska 103a  
26-067 Strawczyn

 serwis@defro.pl

By sending back your Warranty Card, you will be registered in our DEFRO products users database and we will be able to provide you quick and professional technical support.

If you do not send back a correctly filled in Warranty Card and the equipment quality and completeness receipt within the period of up to two weeks after the date of installation but no longer than within six months, after purchasing, **the warranty will become invalid!** This results in delays with repairs and the necessity of **covering costs** of service and travelling expenses.

Thank you for understanding.  
Yours sincerely,

DEFRO Sp. z o.o. Sp. k

## Table of contents

1. INFORMATION.....	6
2. BASIC SAFETY RULES .....	6
2.1. Safety warnings .....	6
2.2. Warnings related to operation .....	7
3. INTENDED USE .....	7
4. TECHNICAL CHARACTERISTIC .....	7
4.1.1. Protective equipment .....	11
5. SYSTEM .....	11
6. TRANSPORTATION AND STORAGE .....	12
6.1. Housing removal .....	12
6.2. Access to control panel .....	12
6.3. Access to the controller and its connectors .....	12
6.4. Working environment .....	12
6.4.1. Gas service line.....	13
6.4.2. Electrical service line.....	13
6.5. Installation of boiler on the wall.....	13
6.6. Connection to the gas system.....	13
6.7. Hydraulic system.....	13
6.7.1. Connection to the central heating system .....	13
6.7.2. Characteristics of the installed pump .....	14
6.7.3. Additional expansion vessel.....	14
6.7.4. Connection of tap water .....	14
6.7.5. Condensate discharge .....	14
6.8. Installation to the flue .....	14
6.8.1. Installation using co-axial pipe .....	15
6.8.2. Installation using two-branched pipes.....	15
6.8.3. Connection of additional equipment.....	15
7. BOILER START-UP.....	16
7.1. Filling the system with water .....	16
7.2. Emptying the water from the boiler .....	16
7.3. Checklist before the start-up .....	16
7.4. Start-up procedure .....	16
7.5. Adjustment and conversion to the other gas.....	16
7.6. Completing the installation .....	17
8. OPERATION.....	18
8.1. Control panel.....	18
8.2. Start-up .....	18
8.3. Operation mode selection .....	18
8.4. Enabling hot water function.....	18
8.5. Enabling central heating function .....	19
8.6. Boiler shutdown .....	19
8.7. Current status .....	19
8.7.1. Normal operating mode.....	19
8.7.2. Central heating and domestic hot water modes enabled .....	19
8.7.3. Central heating and domestic hot water modes enabled and the boiler operates for the central heating purposes.....	19
8.8. Signalling the emergency conditions .....	19
8.8.1. Lock.....	20
8.8.2. Error .....	20
8.8.3. Caution.....	20
8.9. Heat exchanger venting (dAir) .....	20
8.10. Display backlight .....	20
8.11. Quick access setting.....	21
8.12. Messages removal.....	21
8.13. System test .....	21
8.14. User menu .....	21
8.14.1. User settings menu .....	21
8.14.2. Information menu .....	22
8.15. Total boiler shutdown.....	22
9. MAINTENANCE AND CLEANING BY THE USER.....	22
10. EMERGENCY PROCEDURES .....	22
10.1. When the gas odour is stated .....	22
10.2. Flue gas escape.....	22
10.3. Carbon monoxide escape .....	22

11. THE END OF OPERATION .....	22
12. PERIODICAL INSPECTION .....	22
13. TROUBLESHOOTING .....	23
13.1. Protection against freezing .....	23
14. DISPOSAL AFTER THE LIFETIME PERIOD .....	23
15. PRODUCT WARRANTY TERMS AND CONDITIONS .....	23
15.1. Terms and conditions of "48h service" warranty .....	25
16. WARRANTY CARD .....	27

## 1. INFORMATION

The operating manual is an integral and essential part of the product and must be forwarded to the user also in case when the property is transmitted. User should carefully read the manual and save it for the future because all remarks included there are important guidelines concerning safety during installation, usage and maintenance.

Installation of the equipment must be carried out in accordance with the mandatory standards in the country of destination, according to guidelines of the manufacturer and by qualified personnel. Improper installation of the device can be a reason for personal injuries and damage to property for which the manufacturer is not liable.

The equipment can be used only for the purpose it was explicitly intended. Any other use should be treated as inappropriate and in consequence as dangerous.

In case of error during installation, usage or maintenance works caused by non-observance of the legislation, regulations in force or instructions contained in this manual (or others, delivered by the manufacturer) the manufacturer rejects any contractual or non-contractual liability for resulting damages and the warranty for the device becomes void.

All illustrations, pictures and photos are only indicative.

### Versions of the publication

Due to continuous improvement of the product, DEFRO reserves the right to update this publication without prior notice.

The content of this document is a property of DEFRO. Any copying, duplicating, publishing of content of this document without the prior written consent of DEFRO is forbidden.

### Manual storage and browsing its contents

We recommend taking care of this manual and store it in an easily and quickly available location. If this manual has been lost, damaged or destroyed you should request a copy in the sales outlet or directly from the Manufacturer providing identification data of the product. All the most important information included in the operating manual are marked with "bold" and have symbols pointing out the user's attention to hazards that can be present during the operation of the gas boiler. Symbols used in the text are explained below:



#### **Danger!**

*A direct threat to life and health! Non-compliance with the recommendations marked in this way and misuse may result in death or major injuries.*



#### **Danger!**

*Danger from electrical voltage! Incorrect installation and incorrect electrical connections may cause danger to life by electric shock.*



#### **Note!**

*Warning symbol indicating that you should read carefully and understand the given information, to which it relates. Non-compliance with these recommendations may result in major damage to the equipment and create a hazard for the user or the environment.*



#### **Danger!**

*Warning symbol indicating hazard to health resulting from the action of high temperature! Non-compliance with the recommendations distinguished in this way may cause a fire or burns.*



#### **Hint!**

*Informative symbol. Useful information and hints are marked in this way.*

## 2. BASIC SAFETY RULES

### 2.1. SAFETY WARNINGS



- ➔ The national and local provisions should be met.
- ➔ Equipment should be installed in compliance with the legal standards applicable in the given location, region or country.
- ➔ The equipment should be used by a person (including children) of impaired physical, sensory, mental capabilities and by persons without experience and required knowledge provided that such operation is not carried out under their supervision or after proper instruction by a person responsible for their safety.
- ➔ You should always observe the guidelines given in the operating manual to ensure the correct use of the equipment and to prevent accidents.
- ➔ Operation and adjustment should be carried out by adults. Errors and incorrect setting can cause hazardous situations and/or incorrect operation.
- ➔ Before any operations the user (or any person operating the equipment) should read and understand the whole contents of this manual.
- ➔ Equipment should be used only as intended. Each other use is considered as misuse and hazardous as a consequence.
- ➔ In case of disturbances in operation, the equipment can be restarted only when the occurred problem has been removed and the equipment is brought back to its original condition.
- ➔ The user is fully responsible for misuse of the product and relieves DEFRO from any civil and criminal liability.



- ➔ All types of modifications or replacement of equipment parts with non-original components or without authorization may present a risk for the user and relieves DEFRO from warranty services and any civil and criminal liability.
- ➔ It is forbidden to tamper with the sealed components of the boiler!
- ➔ Incorrect installation or maintenance (incompatible with contents of this manual), can cause injuries of people, animals or property damage. Then DEFRO shall be relieved from the warranty services and any civil or criminal liability.
- ➔ Part of the equipment surface is very hot. You should avoid direct contact with such components.
- ➔ Keep children away from the equipment when it is operating because each hot surface can cause burns.

## 2.2. WARNINGS RELATED TO OPERATION



- ➔ Shut down the equipment in case of failure or incorrect operation.
- ➔ Fuel used in the system should correspond to the information given on the rating plate.
- ➔ Equipment should be installed in rooms with fire protection and equipped with all required components such as supply (with air) and flue gas discharge.
- ➔ The equipment should be stored in the rooms free from moisture and they cannot be exposed to adverse effects of the weather.
- ➔ The equipment consumes as much air as it is required for the combustion process.
- ➔ Do not touch the boiler with wet or moist parts of the body and/or barefooted.
- ➔ Disconnect the equipment from the electric grid before the cleaning.
- ➔ Pay attention to regular maintenance and service of the equipment by qualified personnel during the operation.

## ADDITIONAL INFORMATION



- ➔ In case of any problems, you should contact the sales outlet or qualified personnel authorized by DEFRO. Request original spare parts if the repair is necessary.
- ➔ Use only fuel with properties compatible with the recommendations of this user manual.
- ➔ Periodically check and clean the flue gas discharge hoses (connecting piece to the flue).
- ➔ Store this manual carefully because it should be available for a whole period of equipment operation. In case of the sale of giving the equipment to the other user, you should always make sure whether the product has the manual enclosed.
- ➔ Request a new copy from an authorized sales outlet in DEFRO company if it has been lost.

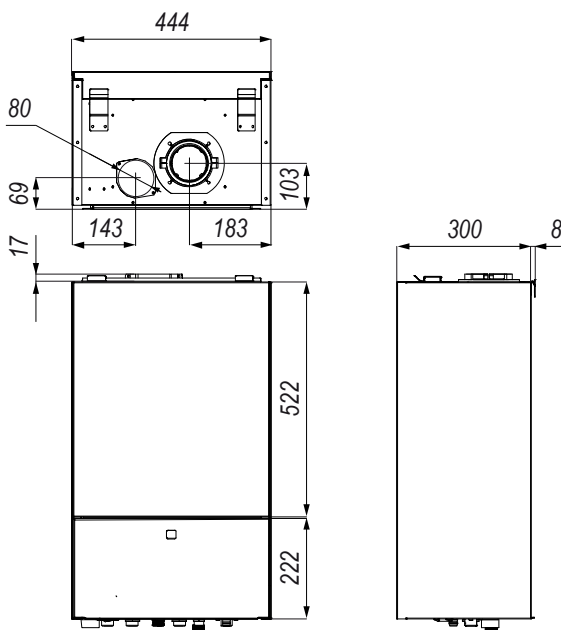
## 3. INTENDED USE

A gas boiler is intended for the combustion of natural (G20, G27, G2.350) and liquefied (G30, G31) gas for heating of water in two separate systems: central heating and tap water (including this equipped with domestic hot water storage vessel). The boiler can be operated only in a closed system of the central heating system.

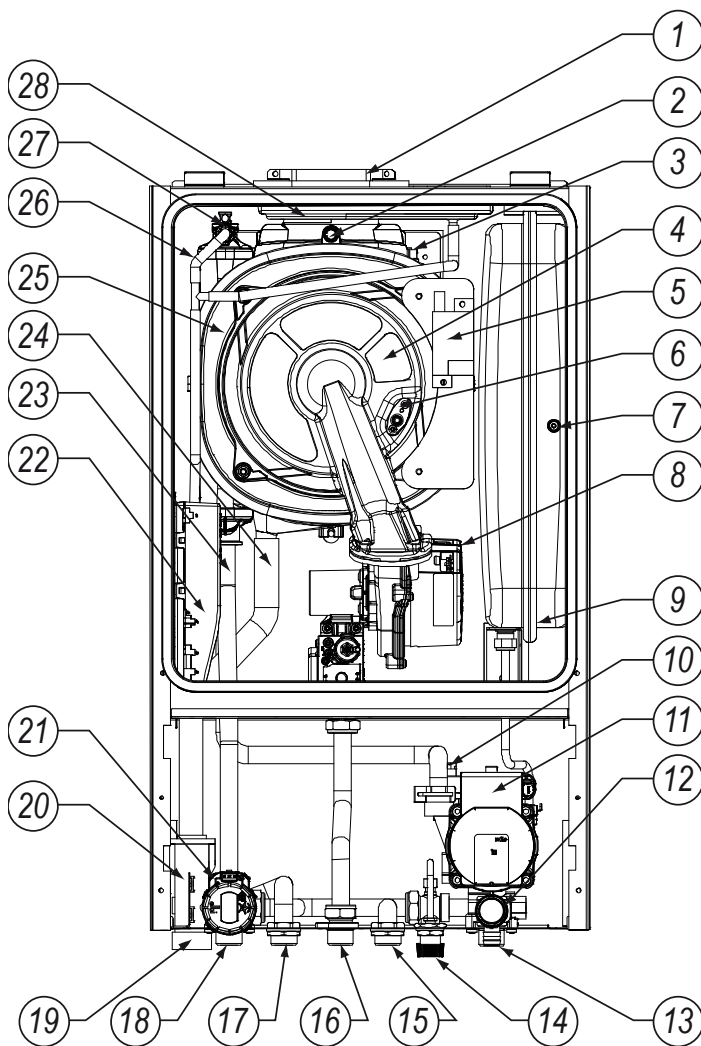
Gas boiler can be connected multiple times.

## 4. TECHNICAL CHARACTERISTIC

Gas boiler operates as a heat source for heating up the water in the central heating system, and it can preheat the tap water in the combination version.



Picture 1 Dimensions of the gas boiler DEFRO DCG COM-FORT 25 1F and 2 F.

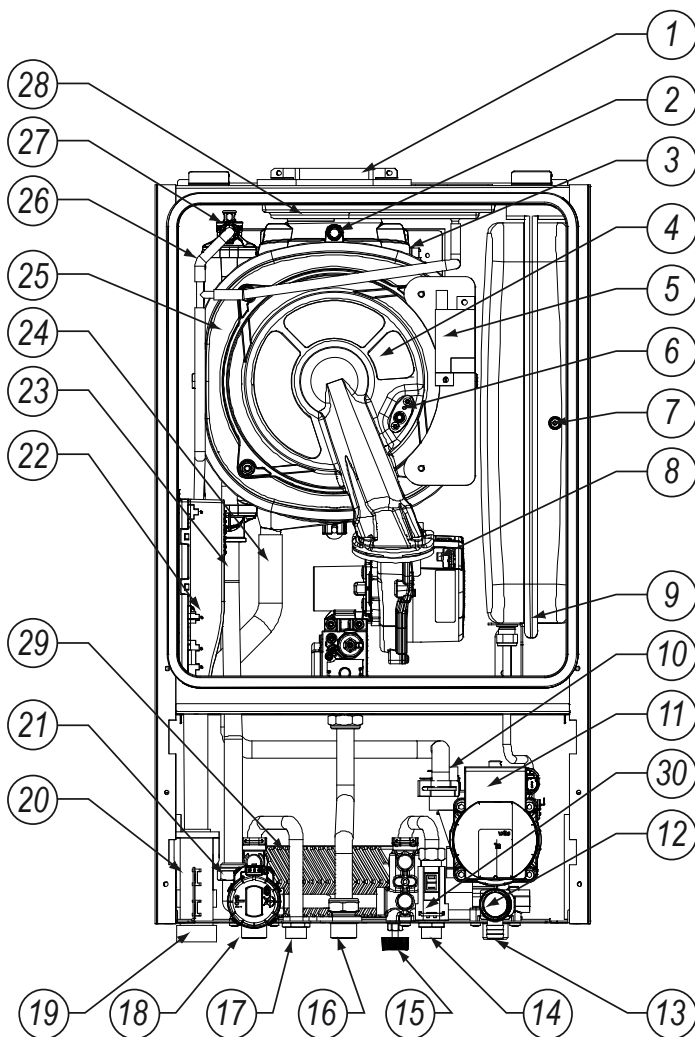


Picture 2. Internal design of the heat-only gas boiler DEFRO DCG COMFORT 25 1F.

*Designation:*

- 1 – flue adapter,
- 2 – flue gas temperature sensor,
- 3 – thermal protection of the heat exchanger,
- 4 – burner,
- 5 – ignitor electrode module,
- 6 – ignitor electrode,
- 7 – valve of expansion vessel,
- 8 – fan integrated with the nozzle and gas valve,
- 9 – expansion vessel 10 l,
- 10 – binary pressure sensor,
- 11 – PWM pump,
- 12 – pressure safety valve,
- 13 – return connector from the central heating system,
- 14 – valve and  $\Phi \frac{1}{2}$ " connector for system filling,
- 15 – domestic hot water return connector,
- 16 – gas connector  $\Phi \frac{3}{4}$ ",
- 17 – domestic hot water supply connector,
- 18 –  $\Phi \frac{3}{4}$ " connector of the central heating system supply,
- 19 – fixture trap cleaning hole,
- 20 – condensate fixture trap,
- 21 – central heating - domestic hot water switching valve,
- 22 – boiler controller,
- 23 – tubular water temperature sensor, installed also on return and supply hose of the central heating system,
- 24 – condensate discharge pipe,
- 25 – heat exchanger,
- 26 – condensate discharge system,
- 27 – heat exchanger air vent,
- 28 – condensate drip tray.

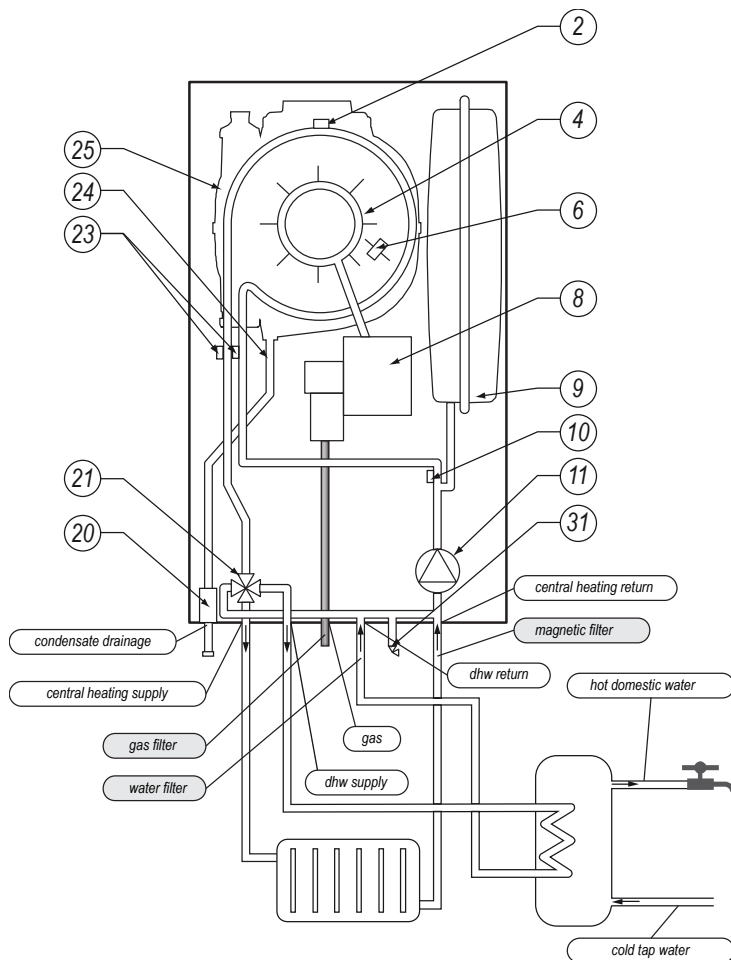




Picture 3. Internal design of the combination gas boiler DE-FRO DCG 25 2F.

*Designation:*

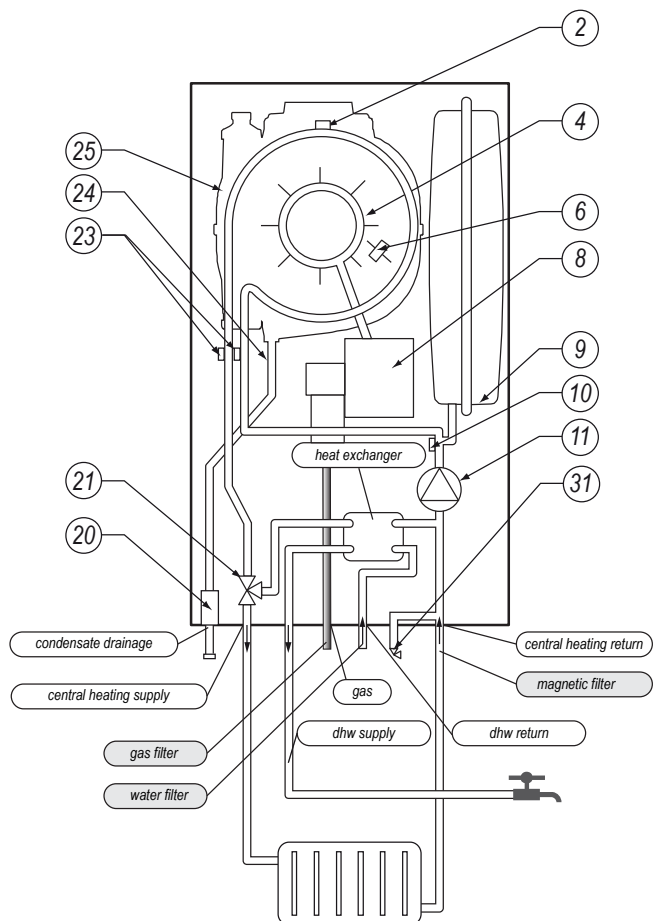
- 1 – flue adapter,
- 2 – flue gas temperature sensor,
- 3 – thermal protection of the heat exchanger,
- 4 – burner,
- 5 – ignitor electrode module,
- 6 – ignitor electrode,
- 7 – valve of expansion vessel,
- 8 – fan integrated with the nozzle and gas valve,
- 9 – expansion vessel 10 l,
- 10 – binary pressure sensor,
- 11 – PWM pump,
- 12 – pressure safety valve,
- 13 – return connector from the central heating system,
- 14 – connector for domestic hot water return and system filling,
- 15 – connector for system filling,
- 16 – gas connector  $\Phi \frac{3}{4}$ ",
- 17 – domestic hot water supply connector,
- 18 –  $\Phi \frac{3}{4}$ " connector of the central heating system supply,
- 19 – fixture trap cleaning hole,
- 20 – condensate fixture trap,
- 21 – central heating - domestic hot water switching valve,
- 22 – boiler controller,
- 23 – tubular water temperature sensor, installed also on return and supply hose of the central heating system,
- 24 – condensate discharge pipe,
- 25 – heat exchanger,
- 26 – condensate discharge system,
- 27 – heat exchanger air vent,
- 28 – condensate drip tray,
- 29 – plate heat exchanger,
- 30 – domestic hot water flow sensor



Picture 4 Schematic diagram of the heat-only gas boiler DEFRO DCG COMFORT 25 1F.

Designation:

- 2 – flue gas temperature sensor,
- 4 – burner,
- 6 – ignitor electrode,
- 8 – fan integrated with the nozzle and gas valve,
- 9 – expansion vessel 10 l,
- 10 – binary pressure sensor,
- 11 – PWM pump,
- 20 – condensate fixture trap,
- 21 – central heating - domestic hot water switching valve,
- 23 – tubular water temperature sensor, installed also on return and supply hose of the central heating system,
- 24 – condensate discharge pipe,
- 25 – heat exchanger,
- 31 – discharge valve.

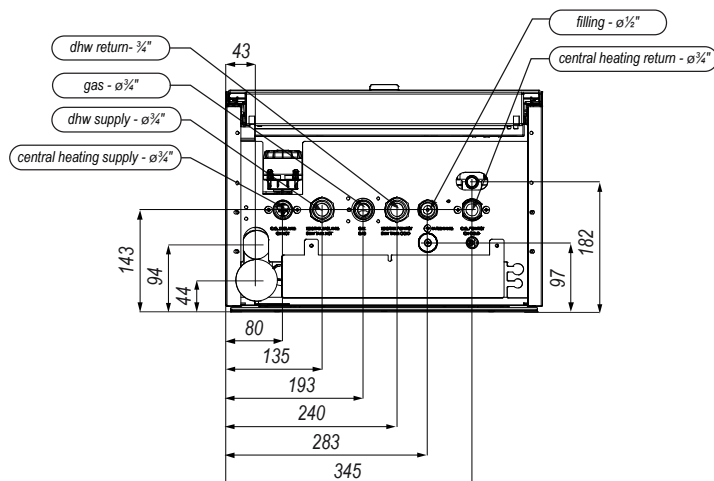


Picture 5 Schematic diagram of the combination gas boiler DEFRO DCG COMFORT 25 2F.

Designation:

- 2 – flue gas temperature sensor,
- 4 – burner,
- 6 – ignitor electrode,
- 8 – fan integrated with the nozzle and gas valve,
- 9 – expansion vessel 10 l,
- 10 – binary pressure sensor,
- 11 – PWM pump,
- 20 – condensate fixture trap,
- 21 – central heating - domestic hot water switching valve,
- 23 – tubular water temperature sensor, installed also on return and supply hose of the central heating system,
- 24 – condensate discharge pipe,
- 25 – heat exchanger,
- 31 – discharge valve.

Picture 6 Arrangement of connectors of the boiler DEFRO DCG COMFORT 25 1F.



Picture 7 Arrangement of connectors of the boiler DEFRO DCG COMFORT 25 2F.

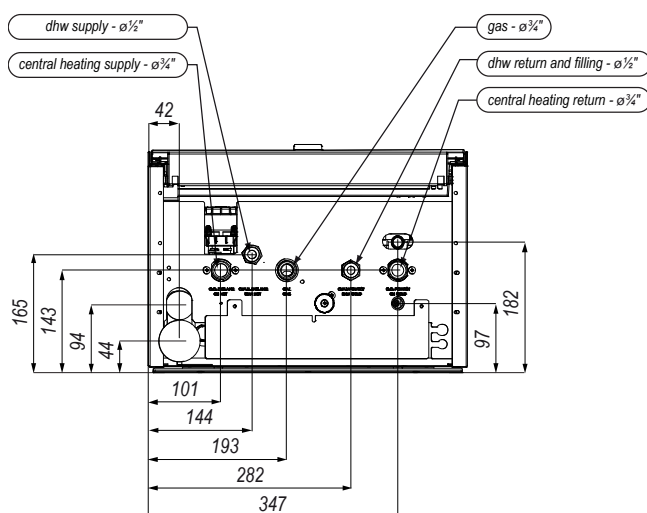


Table 1. Technical data of DEFRO DCG COMFORT 2F boiler.

Parameter	unit of measure	value
Rated thermal output for return/supply water temperature 60/80 °C	kW	22,3
Maximum heat load for the central heating and domestic hot water function	kW	24,0
Flow of domestic hot water (ΔT 30°)	l/min	11
Heating period of domestic hot water (ΔT 30°)	s	30

#### 4.1.1. PROTECTIVE EQUIPMENT

- ➔ Gas anti-outflow protection,
- ➔ Protection against exceeding of max. operating temperature in the heating water system,
- ➔ Protection against exceeding the upper limit temperature of the heating water,
- ➔ Protection against the increase of water pressure - mechanical,
- ➔ Protection against drop in water pressure,
- ➔ Protection against excessive heating of water,
- ➔ Protection of boiler against freezing,
- ➔ Protection against pump jamming,
- ➔ Supervision over the correctness of fan operation. Fan failure is recognized when the actual speed of the fan differs from this expected by the boiler controller.
- ➔ Protection against exceeding the upper temperature of flue gas (115 °C).

- ⚠ If the boiler repeatedly shutdowns due to triggering of any of the protections, then it is required to call the Authorized DEFRO Service to determine the cause.
- ⚠ It is forbidden to make arbitrary modifications in the boiler protection systems.

#### 5. SYSTEM



**It is forbidden to destroy or remove the seals on the structural components. Only qualified and authorized fitter and manufacturer service personnel are authorized to perform modifications of the sealed parts.**

Installation of the gas boiler, adjustment and switching should be performed by qualified personnel. All assembly operations should be performed in accordance with the applicable national and local regulations within the scope of fire protection, requirements of gas distributor and local authorities.

Water and gas system, flue gas handling system should be in compliance with the Regulation of the Minister of Infrastructure of 12.04.2002. (Journal of Laws of 2002, no. 75, item 690) with all subsequent acts amending this regulation if the boiler is installed in the Republic of Poland.

The installation process consists of several steps and their order is very important:

- ➔ suspension of boiler on the wall,
- ➔ installation of external probes,
- ➔ boiler connection to the hydraulic systems,
- ➔ boiler connection to the gas system,
- ➔ installation of flue pipes and air ducts.

Obtain all necessary consents from the appropriate authorities before the installation: Regional gas company, chimney sweeping company and building administration.

Avoid stresses in the executed system to limit the generation of noise during the operation of the system.

After installation of the heating system, it should be immediately notified to the relevant chimney sweeping company, which will provide necessary information related to further operations, which should be performed in the system (e.g. routine measurements, cleaning).

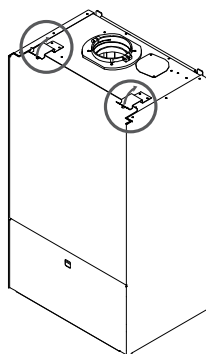
Execution of reconfiguration by refitting to another type of gas should be performed by authorized manufacturer service.

Ensure that the fitter installs the filters, marked with grey background on pictures 4 and 5 (page 10) in the given locations of the system.

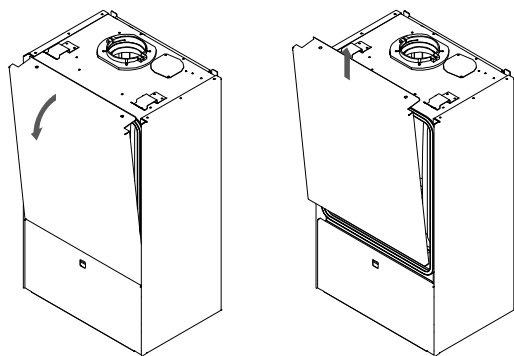
## 6. TRANSPORTATION AND STORAGE

Gas boiler in the packing material should be transported in the vertical position using a special trolley.

### 6.1. HOUSING REMOVAL



Pull up both locks of the front cover, located on the upper wall of the boiler, at the same time. The cover should deflect and get free from the locks.



Deflect the cover slightly, then lift it up, to remove it from the locking gap. Remove cover in this position

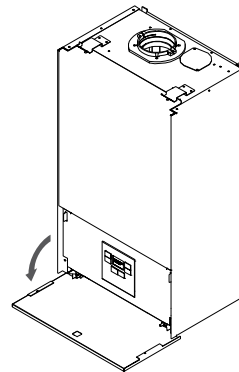


**Front cover rebounds after the release of the locks!**

**The locks should be lifted only until the cover is released. Excessive deflection may result in permanent deformation!**

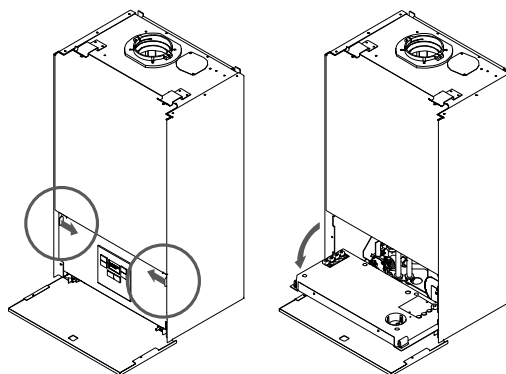
Due to the elasticity of the gasket and soundproofing filling, the cover during installation should be firmly pressed, particularly in the upper part, to ensure that it is properly locked by the catches.

### 6.2. ACCESS TO CONTROL PANEL



The Control panel is located under the bottom flap, which should be pulled using an opening in its upper part and deflect it by 90 degrees.

### 6.3. ACCESS TO THE CONTROLLER AND ITS CONNECTORS



Grab both catches on the sides of the controller enclosure and pull it inwards. Deflect cover panel by approx. 90 degrees after releasing the lock.



**Do not lean on and do not load the cover after opening!**

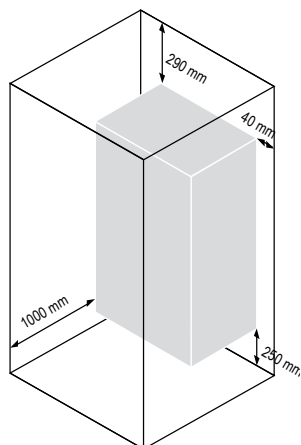
### 6.4. WORKING ENVIRONMENT

Location for the boiler with its surroundings should be properly prepared before the installation of the boiler to ensure that standards and provisions related to the installation and operation of the gas equipment are met. In particular, it is required to meet the requirements of the Regulation of the Minister of Infrastructure of 12 April 2002 (Journal of Laws no. 75, item 690 as amended). Familiarise with the following sections related to the connectors.

The room, where the boiler is to be installed, should meet the following conditions:

- ➔ have a ventilation system in compliance with the applicable regulations,
- ➔ maintain the temperature above 6 °C to prevent freezing of water,
- ➔ be free from the dust and aggressive gases,
- ➔ if bathtub or shower with pool are located in the room, where the boiler is to be installed, then it is required to proceed in conformance with the requirements of PN-HD 60364-7-701,
- ➔ have suitable height and internal volume,

- ➔ connection to sewage system for a condensate discharged from the boiler should be located near the boiler installation location.



Picture 8. Recommended dimensions for a free space around the installed boiler.

The following conditions should be taken into consideration during the selection of the location for boiler installation:

- ➔ national standards,
- ➔ equipment overall dimensions,
- ➔ connectors arrangement: gas, hydraulic and electric,
- ➔ access to pipes: flue pipe and air duct,
- ➔ stability and sturdiness of the wall,
- ➔ maintaining the vertical position of the boiler with an inclination not exceeding 1.5°.

Ensure sufficient space around the boiler, which will facilitate the execution of all fitting operations.

If the boiler is installed on the wall or near the walls susceptible to heat, then they should be properly insulated, in accordance with the regulations applicable for the boiler installation location.

#### 6.4.1. GAS SERVICE LINE

Gas service line, executed in conformance with the requirements and regulations of the country, where the boiler is to be installed, should be located near the gas boiler installation location. The service line with the whole system should consist in:

- ➔ connector led from the gas pipeline,
- ➔ main tap,
- ➔ distribution inlet,
- ➔ cabinet with a gas meter,
- ➔ riser,
- ➔ utility ducts, directed to the gas equipment.

Use the pressure regulator if the pressure of a gas supplying the boiler is too high. The installation may be performed only by an authorized fitter and the regulator should be sealed.



**Gas service line should be made according to the applicable standards.**

#### 6.4.2. ELECTRICAL SERVICE LINE

The electrical system of the gas boiler is intended for supply with the mains voltage 230 V/50 Hz. The room, where the boiler is installed, should be equipped with 230 V/50 Hz electrical wiring system, made in TN-C or TN-S system (with a protective conductor or PEN conductor) in accordance with the regulations applicable within this scope. The electrical wiring system (regardless of the type of the executed system) should be terminated with a plug socket equipped with protective contact. The plug socket should be located at a safe distance from the heat emission sources.



**Use of the socket without a connected protective terminal may cause electrocution.**

**All connections to the electrical system should be made only by an electrician holding appropriate licenses.**

**The user should not remove the electronic controller covers and tamper or make any modifications to the electrical connections.**

### 6.5. INSTALLATION OF BOILER ON THE WALL

- ➔ Determine locations of openings for screw anchors applying the bracket to the wall.
- ➔ Drill the holes with a drill bit  $\varnothing 8$  mm,
- ➔ Insert screw anchors  $\varnothing 8$  mm into drilled holes,
- ➔ Fix the handle using screws  $\varnothing 6$  mm.
- ➔ Lift the boiler and hang it on the bracket fixed to the wall,
- ➔ Check the position of the boiler; it should not deviate from the verticality by more than 1.5°,
- ➔ Ensure that the rear side of the boiler is as parallel to the wall as possible and put washers in the rear part if necessary.

### 6.6. CONNECTION TO THE GAS SYSTEM



**Boiler connection to the gas system should be in compliance with the applicable regulations.**

**Shut off the gas inflow using the main valve before commencing the installation works.**

**Before installation make sure that the gas meter has suitable throughput, also in case when the other equipment is drawing the gas.**

**During installation make sure to avoid getting dirt (dust, water and others) into the gas duct. Install the gas filter.**

**Install gas shut-off valve for the boiler.**

If not stated otherwise by the local regulations, then gas ducts should be led outside the wall. It is indicated to install a filter, stopping the possible contaminants from the gas system, on the gas supply duct. Check tightness after installation.

### 6.7. HYDRAULIC SYSTEM

The boiler is ready for operation in the closed circuit of the central heating hydraulic system.



**If preparation of the hydraulic connector requires welding, it should be executed before the installation of the boiler.**

**Boiler hydraulic system (of central heating and domestic hot water system) should be executed according to the applicable standards and regulations. All the national and local provisions should be met!**

#### 6.7.1. Connection to the central heating system



**The boiler is equipped as a standard with a safety valve installed on the supply side of the heating system.**



**Apply suitable regulations and standards applicable in the destination country if the boiler is installed in the other country than Poland.**



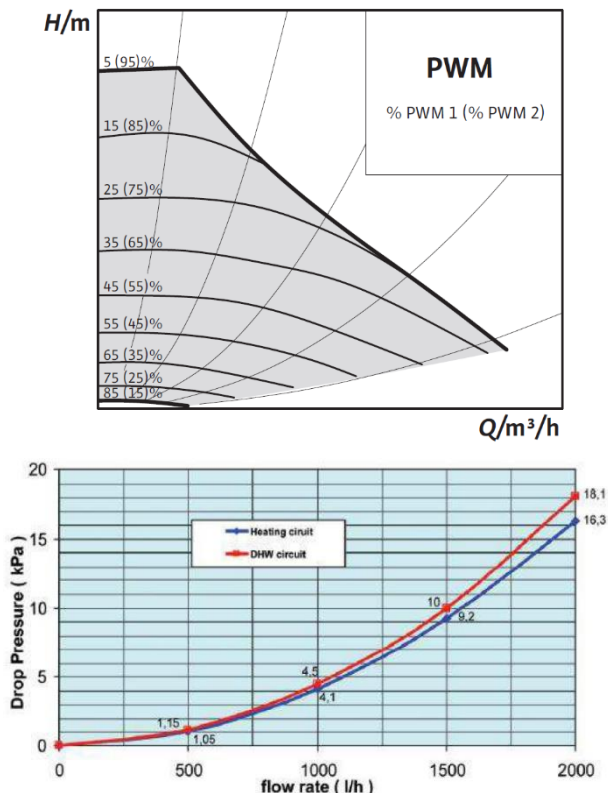
**It is recommended to use protective fixtures, a so-called safety group, consisting of the safety valve, pressure gauge and venting safety device.**



- ➔ Install a water filter on the water return of the central heating system (water filter is not part of the standard equipment of the boiler).
- ➔ Tighten the central heating supply and return connectors using installation fixtures.
- ➔ Flush the central heating system
- ➔ Install shut-off valves, allowing dismantling the boiler without discharging the water from the system, between the boiler and the central heating system.
- ➔ If there is a temperature controller associated with the boiler installed in any room, then you should not install thermostatic valves on the heaters in this room.
- ➔ It is recommended to install a tube or a hose discharging the water from the safety valve to the drain. Lack of system discharging the water from the safety valve may cause flooding of the room, for which the boiler manufacturer shall not be liable.
- ➔ When the installation is completed it is required to fill the heating system with water, vent the central heating system with a boiler and check the tightness of boiler connections with the central heating.

### 6.7.2. CHARACTERISTICS OF THE INSTALLED PUMP

The pump installed in the boiler has stepless speed adjustment with maximum delivery head  $H = 7$  m at  $Q = 0$  m<sup>3</sup>/h and is adapted for any heating system. The below picture presents the characteristics of pressure as a function of flow rate.



Picture 9. Characteristics of the installed pump.

### 6.7.3. ADDITIONAL EXPANSION VESSEL

The boiler is equipped with an expansion vessel of 10 litres capacity. If water volume in the system exceeds 125 litres of system height exceeds 5 metres, then it is required to install an additional expansion vessel, which capacity should be selected acc. to the below table.

Table 2. List of capacities of the additional expansion vessel.

pressure bar (MPa)	Capacity of the expansion vessel based on the capacity of the system							
	100	125	150	175	200	250	300	> 300
0,5 (0,05)	4,8	6,0	7,2	8,4	9,6	12,0	14,4	× 0,048
1,0 (0,10)	7,0	10,0	12,0	14,0	16,0	20,0	24,0	× 0,080
1,5 (0,15)	13,3	16,6	20,0	23,3	26,6	33,3	39,9	× 0,133

Data given in the table refer to the following conditions: safety valve 3 bar (0,3 MPa), average water temperature 70 °C, supply temperature 80 °C, return temperature 60 °C, system filling pressure is lower of the same as pre-loaded pressure of the expansion vessel.

### 6.7.4. CONNECTION OF TAP WATER



**Connection of the tap water to the gas boiler should be in compliance with the applicable regulations.**

**Operation of the tap water container without correctly operating safety valve is forbidden and may be a cause of failure hazardous to the health or life.**

- ➔ It is recommended to install shut off valves in the tap water system facilitating performing the service operations.
- ➔ Domestic water storage vessel should be operated with the safety valve installed with an initial opening pressure  $p_{otw} = 6$  bar (0,6 MPa) and appropriate flow capacity.
- ➔ Connect tube or hose, discharging the water after triggering of the valve, to the safety valve.
- ➔ Fill the system with water and check the tightness of the system after connection.

### 6.7.5. CONDENSATE DISCHARGE

Condensate generated during operation of the gas boiler should be discharged in a way ensuring observance of the following conditions:

- ➔ discharging system should be resistant to its action,
- ➔ system service line should not be blocked and its flow capacity must always be ensured.
- ➔ vertical stove pipes should be installed with 3° slope (approx. 52 mm per one meter of pipe length).

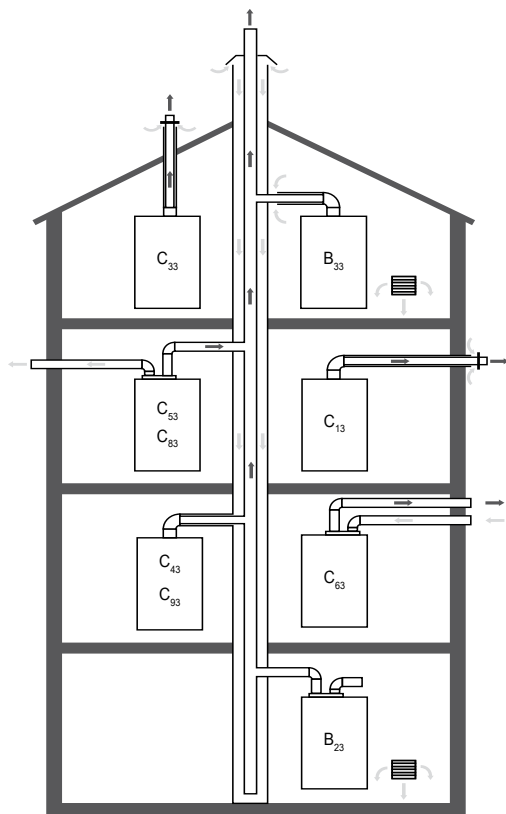
Depending on local regulations it may be necessary to install the condensate neutralisation system.

### 6.8. INSTALLATION TO THE FLUE

The boiler is adapted for connection with (co-axial) direct vent pipe or with separate ducts using appropriate couplings.

Gas boiler can be installed in one of the following configurations:

- ➔ Air intake for combustion from the room:
  - ➔ B<sub>23</sub> – flue gas outlet connected to the smoke flue, the air is drawn from the room using separate duct connected to the boiler.
  - ➔ B<sub>33</sub> – flue gas outlet connected to the smoke flue with coaxial duct, whose air duct draws the air from the room.
- ➔ Air intake from outside:
  - ➔ C<sub>43</sub> – connection using one co-axial direct vent pipe to co-axial direct vent system
  - ➔ C<sub>53</sub> – connection with a separate flue pipe to the smoke flue, combustion air is supplied by a separate vertical air duct from outside.
  - ➔ C<sub>63</sub> – flue gas exhaust with a vertical duct through the wall to outside of the building. Air intake by vertical air duct through the wall of the building (to 20 kW) or from a flue with co-axial direct vent system.
  - ➔ C<sub>13</sub> – flue gas discharge and air intake through the wall of the building (only for boilers of power up to 20 kW). Implemented by two separated pipes or one co-axial pipe.
  - ➔ C<sub>33</sub> – connection to co-axial direct vent pipe.



Picture 10 Classification of methods for flue gas extraction and delivery of air for combustion in the gas boilers



**C<sub>13</sub>, C<sub>33</sub>** – Ends for two-branched outlet should be arranged inside a square of side 50 cm.

**C<sub>63</sub>, C<sub>53</sub>** – Ends for air suction and flue gas extraction should not be located on the opposite walls of the building.

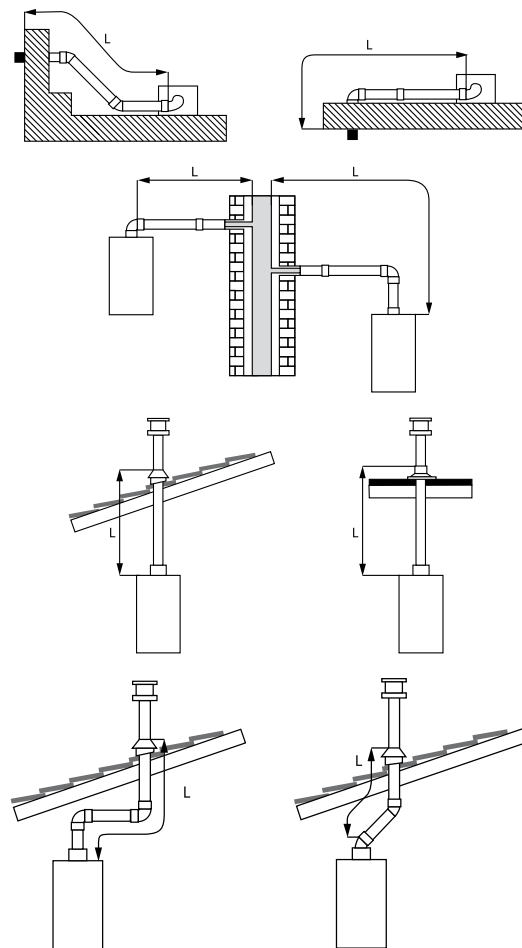
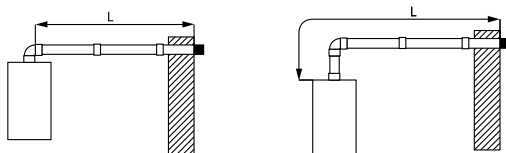
**C<sub>43</sub>, C<sub>83</sub>** – Flue or smoke flue should be properly adapted, also for the flue gas containing the condensate.

**C<sub>63</sub>** – Flue pipes should be resistant to temperatures over 100°C, and pipe termination should be made in accordance with the standard **EN-1856-1**.

#### 6.8.1. INSTALLATION USING CO-AXIAL PIPE

If the flue gas extraction and combustion air intake are installed in the same co-axial pipe, then please note the following rules:

- ➔ Outlet-aspirating duct should protrude by min. 18 mm from the wall.
- ➔ Installation of elbow 90° results in a reduction of total allowable length of the pipe by 1 meter.
- ➔ Installation of elbow 45° results in a reduction of total allowable length of the pipe by 0.5 meter.
- ➔ First elbow on the boiler is not taken into consideration.
- ➔ Vertically led pipes should be fixed to the wall using brackets arranged in approx. 1-meter distance.
- ➔ Preferably avoid vertical sections, and if they are used, then you should consider a minimum slope of 5 cm per 1 meter of length directed towards the boiler.



Picture 11. Determination of length of the flue pipe.

The length of a co-axial pipe should not exceed the following values:

- ➔ B<sub>33</sub>:  
L = 15 m for Φ 80/125
- ➔ C<sub>13</sub>, C<sub>33</sub>, C<sub>43</sub>, C<sub>93</sub>:  
L = 10 m for Φ 60/100  
L = 15 m for Φ 80/125

#### 6.8.2. INSTALLATION USING TWO-BRANCHED PIPES

Use of separate pipes for extraction of flue gas and air intake requires the installation of a special branched outlet on the boiler.

The following should be taken into consideration for the determination of the length of the duct:

- ➔ Installation of elbow 90° decreases its total length by 0.5 meter,
- ➔ Installation of elbow 45° decreases the total length of the duct by 0.25 meter,
- ➔ First elbow on the boiler is not taken into consideration.

The maximum length of the ducts L<sub>1</sub> - air duct and L<sub>2</sub> - flue pipe:

- ➔ B<sub>33</sub>:  
L<sub>1</sub> = 0 m, L<sub>2</sub> = 65 m for Φ80-Φ80
- ➔ C<sub>13</sub>, C<sub>33</sub>, C<sub>43</sub>, C<sub>93</sub>:  
L<sub>1</sub> = 15 m, L<sub>2</sub> = 60 m for Φ80-Φ80 and rigid hose  
L<sub>1</sub> = 10 m, L<sub>2</sub> = 30 m for Φ80-Φ50 and rigid hose  
L<sub>1</sub> = 10 m, L<sub>2</sub> = 30 m for Φ80-Φ50 and flexible hose
- ➔ C<sub>53</sub>, C<sub>83</sub>:  
L<sub>1</sub> = 15 m, L<sub>2</sub> = 60 m for Φ80-Φ80 and rigid hose

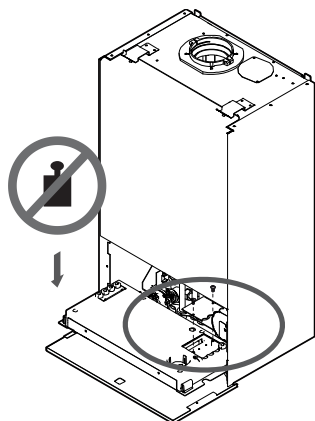
#### 6.8.3. CONNECTION OF ADDITIONAL EQUIPMENT

The boiler can be equipped with additional sensors, while the number of sensors depends on the boiler variant:

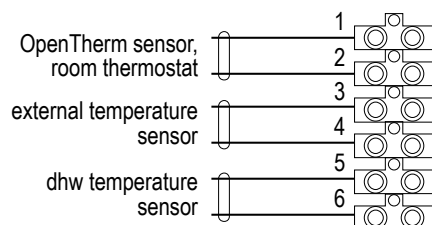
- ➔ Room thermostat

- ➔ External temperature sensor
- ➔ Water temperature sensor for the domestic hot water container

Location of sensors connector and arrangement of its terminals is presented on the following pictures.



Picture 12. Disassembly of the recess cover for connection of the external sensors.



Picture 13. Arrangement of sensor terminals and their markings.

## 7. BOILER START-UP



**First start-up after installation may be performed only by the qualified employee with appropriate authorizations.**

A boiler start-up procedure should be performed in one of the following cases:

- ➔ First start-up after installation
- ➔ Start-up after a longer period of standstill
- ➔ Start-up after each event, which required re-starting (failure of the system, removal of boiler failure etc.)

### 7.1. FILLING THE SYSTEM WITH WATER

Before installation make sure that the central heating system is correctly filled with water, which should be clean, clear and without any additives. The water unit should be filled with water only when it is cooled down.

Water quality has a fundamental impact on the durability of the water unit and the whole central heating system. The Water should have the following parameters:

- ➔ pH reaction:
  - ➔  $8,0 \div 9,5$  – in the system made of steel and cast-iron;
  - ➔  $8,0 \div 9,0$  – in systems made of copper and steel/copper materials;

### 7.5. ADJUSTMENT AND CONVERSION TO THE OTHER GAS



**Adjustment and conversion to the other gas can be performed only by the Authorized DEFRO Service.**

**The label with boiler data for the currently used gas should be always placed on the boiler!**

- ➔  $8,0 \div 8,5$  – in systems with aluminium heaters;
- ➔ total hardness  $< 20$  °f,
- ➔ free oxygen content  $< 0,1$  mg/l, recommended  $< 0,05$  mg/l,
- ➔ chloride content  $< 60$  mg/l.

Fill the system with water before boiler start-up. This operation should be carried out slowly to ensure the removal of the air from the system.

Open straight-through valve on signalling pipe for several seconds to check if the system is completely filled with water. Continuous, non-interrupted water outflow indicates that the system is filled completely and correctly. Possible refilling the water in the system should take place during breaks in boiler operation.



**Refilling the water in the system is only a consequence of losses by evaporation. Other losses e.g.: system leaks are not allowed, may cause the formation of boiler scale, what may cause permanent damage to the system and boiler.**

### 7.2. EMPTYING THE WATER FROM THE BOILER

- ➔ Switch off the controller if the boiler has been already started.
- ➔ Switch off the boiler supply.
- ➔ Close the gas inflow.
- ➔ If the boiler has been previously started and water temperature exceeds  $40^{\circ}\text{C}$  - wait until it drops below this value.
- ➔ Open the installed discharge valve.
- ➔ Open the heaters vent valves.
- ➔ Discharge the water from the boiler system.

### 7.3. Checklist before the start-up

- ➔ Check if the gas type corresponds to the data given on the boiler rating plate.
- ➔ Check boiler gas system.
- ➔ Check boiler hydraulic system.
- ➔ Check flue gas discharge circuit and boiler air intake system.
- ➔ Check the value of the hydraulic pressure in the heating system ( $0,10 - 0,15$  MPa).
- ➔ Check correctness of the connections with all external components (thermostats, probes etc.).

### 7.4. START-UP PROCEDURE

1. Open main gas valve.
2. Open gas tap on the boiler.
3. Open front panel.
4. Check gas supply pressure at the gas valve's pressure connector.
5. Check the tightness of gas connections in the boiler downstream of the gas valve.
6. Check the tightness of the gas pipes with the valve at the test pressure not exceeding 60 mbar (0,006 MPa).
7. Vent the gas supply pipe unscrewing the pressure connector on the gas valve until the air from the system is completely removed.
8. Check the filling of the trap and fill it with water if necessary.
9. Check the tightness of the hydraulic system and if there are no losses.
10. Check tightness and correctness of connections of the flue gas system.
11. Switch on the electric supply of the boiler.



The brand-new boiler has operating parameters in compliance with the type of gas given on the rating plate. Depending on the type of the gas and length of the flue-air system the boiler should be adjusted in compliance with the parameters given in table **Błąd! Nie można odnaleźć źródła odwołania..** For intermediate lengths of the flue-air pipe, you should assume proportional values.

If the boiler should be supplied with the other type of gas then it should be converted. This operation should be performed only by Authorized DEFRO Service. The Conversion should be performed as given below:

- ➔ Determine the required fan speeds using table **Błąd! Nie można odnaleźć źródła odwołania.** based on the flue-air pipe and type of gas: maximum central heating and domestic hot water, minimum central heating and ignition:
- ➔ Set in the controller the speeds calculated in the previous step,
- ➔ adjust the gas valve in a way ensuring that the measured CO<sub>2</sub> content in the flue gas for a minimum and maximum power corresponds to the values for a new gas given in table **Błąd! Nie można odnaleźć źródła odwołania..**

It is required to stick one of the rating plates delivered with the boiler, containing information on the currently used gas, after the conversion.

Table 3. Adjustment parameters of the boiler DEFRO DCG COMFORT 25 2F and 1F.

Parameter		unit	Gas type				
			2E(G20)	2Lw(G27)	2Ls(G2.350)	3P(G31)	3B/P(G30)
Length of the flue-air pipe ø 60/100 mm equal to 1 m							
Maximum rotational speed of the fan for a central heating		rpm	11500	11500	11500	10800	10800
Maximum rotational speed of the fan for a domestic hot water			11500	11500	11500	10800	10800
Minimum rotational speed of the fan for central heating			2500	2600	2600	2500	2500
Ignition rotational speed of the fan			3750	3750	3750	3750	3750
Length of the flue-air pipeø 60/100 mm equal to 12 m							
Maximum rotational speed of the fan for a central heating		rpm	11700	12500	12650	11500	11100
Maximum rotational speed of the fan for a domestic hot water			11700	12500	12650	11500	11100
Minimum rotational speed of the fan for central heating and domestic hot water			2600	2800	2650	2700	2700
Ignition rotational speed of the fan			3750	3750	3750	3750	3750
CO2 content in flue gas							
Minimum load for central heating and domestic hot water	CO2	%	8,5	8,5	8,2	10	10,2
Maximum load for domestic hot water	CO2	%	9,0	9	8,6	10,5	10,8

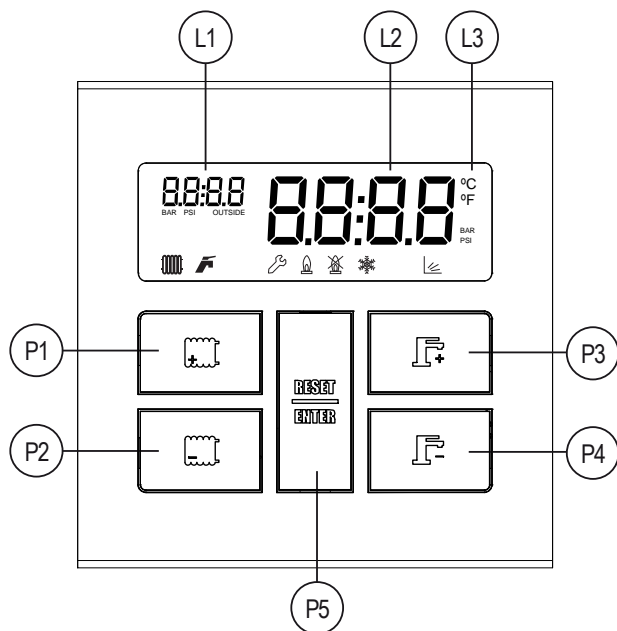
## 7.6. COMPLETING THE INSTALLATION

After the installation and start-up of the boiler, the fitter should instruct the User on the operation of the boiler with its protective equipment and provide the User with the operating manual.

## 8. OPERATION

Observe warnings displayed on the boiler control panel during operation.

### 8.1. CONTROL PANEL



#### Display fields

Screen designation	Description
L1	Field displaying temperature from the outside sensor (if enabled).
L2	Current values: water temperature in central heating or domestic hot water, pressure error number.
L3	Units of the L2 field: temperature can be displayed in C or F.

#### Icons



The icon indicates that central heating has been enabled. Diode flashing indicates heat demand in the central heating system and operation of the boiler in accordance with this demand.



The icon indicates that domestic hot water mode has been enabled. Diode flashing indicates heat demand in the domestic hot water mode and operation in accordance with this demand.



Signalling of the need to perform boiler inspection



Signalling of boiler operation (burner operation)



Signalling that it is impossible to start the boiler, boiler in lock mode.



Signalling that anti-freeze protection has been enabled.



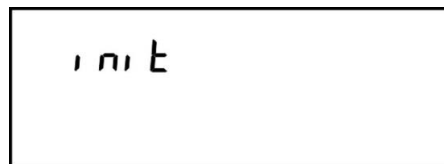
Signalling that boiler operates acc. to the indications of the outside sensor.

## Buttons

Button	Function	Description
P1	Return, Increase (+)	Increase of set temperature for central heating (when central heating is activated). Menu: Exit from menu (return to the previous menu) or clearing of value of the edited parameter.
P2	Return, Decrease (-)	Decrease of set temperature for central heating (when central heating is activated). Menu: Exit from menu (return to the previous menu) or clearing of value of the edited parameter.
P3	Increase (+)	Increase of set temperature for domestic hot water (when domestic hot water is activated). Menu: Choice of next menu item or increase of the value of the edited parameter.
P4	Decrease (-)	Decrease of set temperature for domestic hot water (when domestic hot water is activated). Menu: Choice of the previous menu item or decrease of the value of the edited parameter.
P5	Menu, selection, Clearing	Enter to main menu or clearing of boiler lock error by pressing the button for min. 3 seconds. Menu: Choice of item/parameter in the menu or saving the modified value in the menu

### 8.2. START-UP

After start-up of the boiler, the display will show „init“ text until the data transfer process related to the boiler condition to the control panel is not completed.



Data transport completion results in switching to the normal operating mode of the panel and the display will show information related to the current condition of the boiler.

In case of a failure of the communication connection the panel will indicate a connection error in a form of the message „no CONN“.



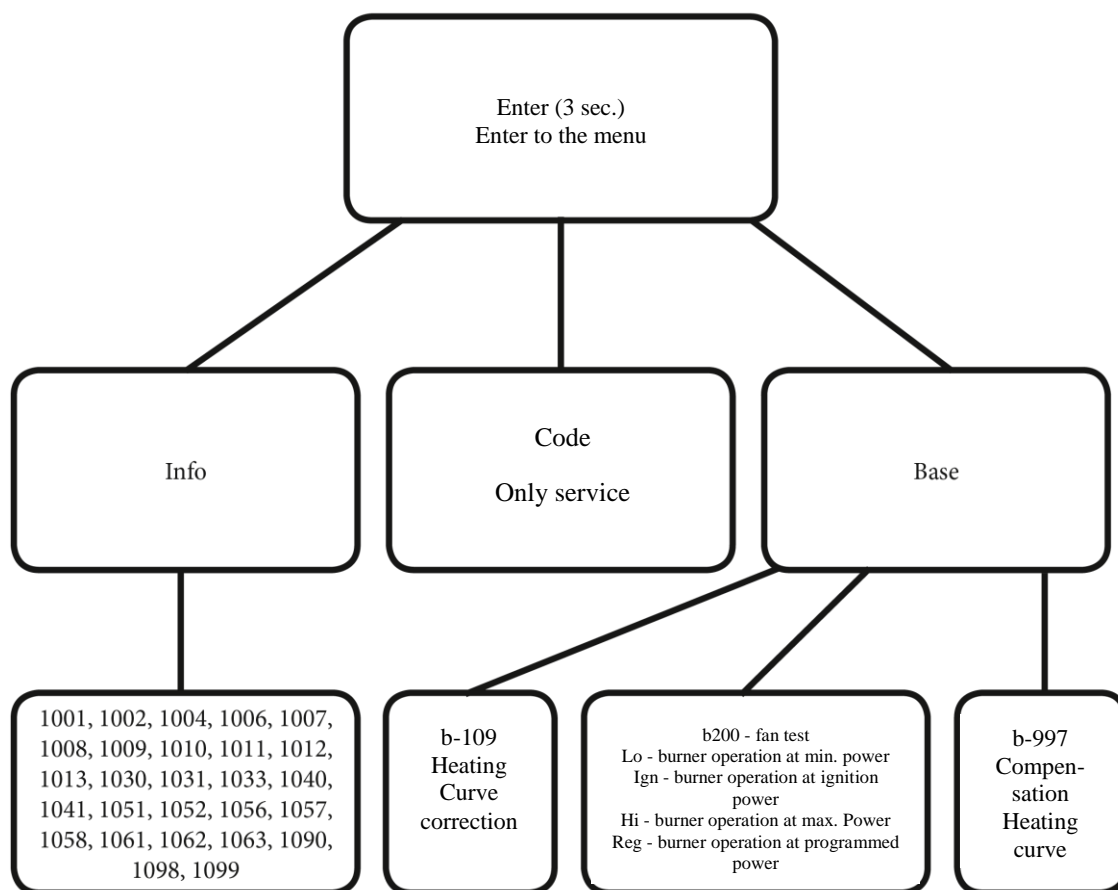
### 8.3. OPERATION MODE SELECTION

The boiler can operate under the following operating modes:

- ➔ **OFF** – boiler does not operate, but the controller with control panel is enabled, also additional functions such as anti-freeze function are enabled,
- ➔ **c.w.u.** – boiler preheats only domestic hot water
- ➔ **c.o.** – boiler preheats only water supplying the central heating system,
- ➔ **c.w.u. + c.o.** – boiler heats the domestic hot water and supplies the central heating system.

### 8.4. ENABLING HOT WATER FUNCTION

The **domestic hot water (c.w.u.)** mode is enabled automatically if, using **P3** and **P4** buttons, you set the temperature higher than the minimum **domestic hot water** temperature. Activation of the **domestic hot water (c.w.u.)** function is confirmed by a tap icon on the display.



Decreasing the **domestic hot water (c.w.u.)** temperature below the minimum temperature results in disabling the domestic hot water function and displaying the **OFF** text instead of the set temperature.

## 8.5. ENABLING CENTRAL HEATING FUNCTION

The **central heating (c.o.)** mode is enabled automatically if, using **P1** and **P2** buttons, you set the temperature higher than the minimum **central heating** temperature. Activation of this function is confirmed by a heater icon on the display.

Decrease of the **central heating** temperature below the minimum temperature deactivates the **central heating** function, what is indicated by the **OFF** text in a place of a set temperature.

## 8.6. BOILER SHUTDOWN

The boiler is shutdown by decreasing the temp. below the minimum value for **the central heating and domestic hot water (OFF)**.

## 8.7. CURRENT STATUS

Correct operation of the boiler is signalled by displaying the current status with information on the currently performed operations.

### 8.7.1. NORMAL OPERATING MODE

Field with large digits on the display contains water supply temperature in the system, when the boiler is in standby mode (no demands for heating) or when it operates for heat demand in the **central heating** system. When the equipment is heating the water for the purposes of the **domestic hot water** system then the temperature of domestic hot water is displayed. Small digits on the display indicate value of pressure in the **central heating** system and/or temperature of external weather compensation sensor (if present).

### 8.7.2. CENTRAL HEATING AND DOMESTIC HOT WATER MODES ENABLED

Heater and tap icon confirms that **central heating** and **domestic hot water functions** are enabled. If these icons are not flashing it indicates that the boiler is in idle mode - it means that it does not heat the water for any of these systems.



### 8.7.3. CENTRAL HEATING AND DOMESTIC HOT WATER MODES ENABLED AND THE BOILER OPERATES FOR THE CENTRAL HEATING PURPOSES

Flashing heater icon indicates that the boiler is operating for the purposes of the central heating system, therefore it displays water supply temperature for the central heating system. The tap icon (**domestic hot water**) is lit but it is not flashing.



## 8.8. SIGNALLING THE EMERGENCY CONDITIONS

In the case of emergency, messages belonging to one of the three categories may appear on the screen:

- Lock (**Loc**)
- Error (**Err**)

- Warning (AttE)

The field with large digits will contain a number of the given event. Optionally, it may display text information with the number (depending on the type of error/lock).

Table 4. Optional messages for errors and warning events.

Number	Error	Description
1	Ignition error	Three failed ignition attempts
4	Boiler lock time exceeded	The controller at least 20 hours in the lock
5	No fan revolutions	The fan is not rotating for more than 60 seconds
6	Low fan revolutions	The fan had lower rotations then set values more than 60 seconds
7	High fan revolutions	The fan had higher rotations then set values more than 60 seconds
15	Max. boiler temp. exceeded	Thermal protection of the boiler triggered
16	Max. flue gas temp. exceeded	Max. value of flue gas temp. exceeded
20	Burner extinguishing error	The flame does not extinguish 10 seconds after closing the main valve
21	Flame before ignition	Flame before ignition
22	Too many failed ignition attempts	Loss of flame during ignition, three (3) times during one ignition
105	Max. supply temp. exceeded	Supply temp. has value above the allowable value for the given period of time
114	Flame occurrence error	Flame detected in the condition without heating demand
115	Low water pressure	Low pressure, below the set value
119	Return temp. sensor open	Return temp. sensor not connected
120	Supply temp. sensor open	Supply temp. sensor not connected
122	DHW temp. sensor open	Domestic hot water temp. sensor not connected
123	Flue gas temp. sensor open	Flue gas temp. sensor not connected
125	Ext. temp. sensor open	Ext. temp. sensor not connected
126	Return temp. sensor shorted	Return temp. sensor shorted
127	Supply temp. sensor shorted	Supply temp. sensor shorted
129	DHW temp. sensor shorted	Domestic hot water temp. sensor shorted
130	Flue gas temp. sensor shorted	Flue gas temp. sensor shorted
132	Ext. temp. sensor shorted	Ext. temp. sensor shorted
133	Supply error	Supply frequency error
134	Reset button error	Reset button used too many times during a short period
135	Incorrect polarity of supply conductors	Phase and neutral conductor connected inversely
136	Heat exchanger temp. sensor – lock	Heat exchanger temp. exceeded 90°C
155	WD configuration error	
162	Low water pressure	Sudden leak from the system below the set pressure
165	Low supply voltage	Low supply voltage for a time longer than 60 seconds

166	High supply voltage	Too high supply voltage for a time longer than 60 seconds
168	Flue gas temp. exceeded	Flue gas temp. exceeded the allowable max. temp.
204	Ext. temp. sensor error	Sensor not connected/shorted
205	System temp. sensor error	Sensor not connected/shorted
206	Heat exchanger protection – burner lock	Heat exchanger protection function locks the implementation of the request by the burner

### 8.8.1. LOCK

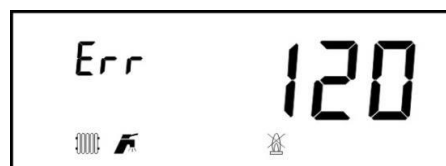
The following picture presents a view of the display during a lock. No flame icon indicates that the boiler is not operating due to event with number 6, with additional messages Loc in the small digits field. Restart the equipment by pressing the button P5.

If the lock message appears after the reset then you should reset it once again. The controller will be locked if three successive reset attempts are failed. Contact Authorized DEFRO Service.



### 8.8.2. ERROR

Text „Err” with a number is displayed. No flame icon signals that the boiler is not operating. Contact the manufacturer's service providing a name of displayed error. The boiler will return to normal operation after removal of cause of the error.



### 8.8.3. CAUTION

Text „AttE” with a number is displayed. The device is not locked but it may have limited functionality, depending on type of the warning.



### 8.9. HEAT EXCHANGER VENTING (DAIR)

When the venting function is active it will display information: 'dAir'. This function may be disabled by pressing together P2 + P4 buttons and holding them for at least 3 seconds.

### 8.10. DISPLAY BACKLIGHT

The display will be darkened (decrease of illumination level) automatically after 4 minutes of inactivity of the user. The display will be re-activated after pressing one of the buttons or the action of the user will be required, e.g. if the service is required or system test is in progress.

After suspension, lock or warning the screen backlight will flash to notify the user. Flashing frequency depends on the type of the error.

Error type	Flashing frequency
Lock	2 Hz (0.5 sec. interval)
Error	1 Hz (1 sec. interval)
Caution	0,67 Hz (1.5 sec. interval)

### 8.11. QUICK ACCESS SETTING

Settings of a temperature for central heating and domestic hot water may be performed on the main screen:

- ➡ Pressing **P1** and/or **P2** button allows changing the required central heating temperature (heater icon should flash in the edit mode).
- ➡ Pressing **P3** and/or **P4** button allows changing the required domestic hot water temperature (tap icon should flash in the edit mode).

Boiler operation in central heating and/or domestic hot water mode can be stopped by selecting **OFF** option. To restart operation of in central heating and/or domestic hot water mode it is required to set the required temperature, which will be automatically saved, when the temperature edit mode disappears, that is when the new value will be confirmed with the **P5** button, no button will be pressed for 5 seconds or the switch to temperature value setting for the other mode occurs.

⚠ Edit and set the temperature for some central heating or domestic hot water configurations is impossible. When compensation of the external temperature is active then temperature settings is determined by the controller, therefore it cannot be set by the user, but the calculated value is displayed on the screen.

⚠ Quick temperature setting is locked if the system test is active, and temperature setting buttons are used to change the test, what facilitates work of the fitter during installation of the boiler.

### 8.12. MESSAGES REMOVAL

If the boiler controller is in the lock mode then pressing **P5** (Enter/Reset) button for the given time causes that the lock message will be deleted and the controller will switch to the restart mode. After system initialization the device should be restarted and switched to normal operating mode. Error information should disappear after the restart.

### 8.13. SYSTEM TEST

System test can be started in the following cases:

- ➡ programming the boiler operating mode by the fitter,
- ➡ checking the flue gas discharge system by the chimneysweep,
- ➡ checking the correctness of boiler operation by the user.

System test may be activated from the user level (0.000), selecting parameter **200** (press Enter for 3 seconds → Base → **b200**). Equipment operation in test mode is signalled on the screen by 'tES' message with a type of the test given.

Type of test can be changed using one of the buttons: **P1**, **P2**, **P3** or **P4**. Quick access to set temperatures is not active during the test.

Test	Description
OFF	System test enabled
FAN	Fan test (rotational speed set)
Lo	Boiler test with low power
Ign	Boiler test with ignition power
Hi	Boiler test with high power
REg	Boiler test with high limited power
Stb	STB protection triggering test (only for fitter)
LCO1	Low water level shut-off test 1 (only for fitter)
LCO2	Low water level shut-off test 2 (only for fitter)

⚠ The system test is finished automatically, after the specified time.

### 8.14. USER MENU

User menu is displayed after a short pressing of the **P5** key. The menu contains a list of the other menus, including these available for the user and for the fitter.

The menu is navigated using **P3** and **P4** buttons, while the item is selected by **P5** button. Exit from the given item or return to the main menu is made using **P1** or **P2** button.

Change of selected parameter is possible when its value flashes; and the value is changed by pressing **P3** and **P4** buttons. Select **P5** button to confirm the modifications. Exit from the edition of these parameters without saving of changes possible by the use of the **P1** and **P2** buttons

No response of the user for at least 4 seconds results in exit from the menu and edited value will not be saved.

#### 8.14.1. USER SETTINGS MENU

Num-ber	Description
<b>b109</b>	Correction of the weather curve, temp. set for central heating
<b>b200</b>	System test. Starting the systems test is limited to the tests available for the user. Performing the other tests, such as e.g. LWCO, is possible from the fitter or higher level.
<b>b997</b>	Heating curve selection
<b>b998</b>	Access code on fitter level
<b>b999</b>	Access code on manufacturer level

### 8.14.2. INFORMATION MENU

The menu contains information available on the user's level about current condition of the equipment.

Number	Description
i001	Supply temperature
i002	Central heating temperature
i004	Outside temperature
i006	Flue gas temperature
i007	Return temperature
i008	Ionization/flame current in $\mu\text{A}$
i009	Main pump status - enabled, disabled
i010	Central heating pump status - enabled, disabled
i011	Domestic hot water pump status - enabled, disabled
i012	Central heating temperature currently set
i013	Condition of the room thermostat input - open, closed
i030	Boiler status
i031	Error number
i033	Central heating pressure value
i040	Current rotational speed of the fan in rpm $\times 10$
i041	Rotational speed of the fan during ignition in rpm $\times 10$
i056	Total operation time of the boiler in central heating mode in h $\times 10$
i057	Total operation time of the boiler in domestic hot water mode in h $\times 10$
i058	Total operation time of the boiler in the number of days
i059	Interval between the suspensions - 1: Minute, 2: hour, 3: days, 4: weeks
i060	Interval between the locks: 1: minute, 2: hour, 3: days, 4: weeks
i061	Instantaneous turbine speed (value used for measurement of the parameter 1062) – rpm
i062	Water flow in litres per minute
i063	Voltage 0-10V of input in Volts
i090	The remaining number of days to the inspection (negative value means that the deadline has been exceeded)
i098	900MN – group name
i099	900MN CRC (software version)

### 8.15. TOTAL BOILER SHUTDOWN

To shutdown the boiler you should first close the fuel supply turning off the gas valve and then disconnect the power supply taking the plug out of the supply socket.

## 9. MAINTENANCE AND CLEANING BY THE USER

- ➔ Cleaning of water filter before the heating season
- ➔ Inspection and cleaning of the water filter during the season to state the lower flow.
- ➔ Refilling the water in the central heating system
- ➔ Venting the system and boiler
- ➔ Keeping the boiler housing clean using water with a mild detergent
- ➔ Inspection of flow capacity of the condensate discharge system and unblocking it during operation.

## 10. EMERGENCY PROCEDURES

### 10.1. WHEN THE GAS ODOUR IS STATED

Leaking gas may cause an explosion, therefore if you notice its presence in the room or building, you should observe the following procedures:

- ➔ Avoid formation of the sparks and flames: do not use matches, lighters, do not activate the electrical receivers, do not use phone, bell,
- ➔ Close the main gas valve,
- ➔ Open doors and windows,
- ➔ Warn all residents and leave the building,
- ➔ Prevent access of members of the public into the building,
- ➔ Notify the appropriate services: fire department, police and gas emergency service.

### 10.2. FLUE GAS ESCAPE

Flue gas escape is another possible hazard to life. If you notice damage to the flue system or the presence of flue gas odour:

- ➔ Disconnect the device supply
- ➔ Open doors and windows
- ➔ Warn all residents and leave the building,
- ➔ Prevent access of members of the public into the building,
- ➔ Notify the authorized fitter company to remove the defect.

### 10.3. CARBON MONOXIDE ESCAPE

Carbon monoxide is a toxic, colorless gas formed during incomplete combustion of such fuels as oil, gas or solid fuels. The occurrence of carbon monoxide is a result of defect or leaks in the system.

Given the impossibility to detect the presence of this hazardous gas you should:

- ➔ Perform inspections of the system and its maintenance by authorized companies on a regular basis
- ➔ Install CO sensors, signalling the presence of carbon monoxide with alarm

If you detect the presence of the carbon monoxide you should follow the below recommendations:

- ➔ Warn the other residents and immediately leave the building,
- ➔ Notify the authorized fitter company to remove the defect.

## 11. THE END OF OPERATION

It is recommended to shutdown the boiler completely and clean the equipment after each heating season.

## 12. PERIODICAL INSPECTION

After each heating season, but at least once a year, the boiler should be subject to periodic inspection, which may be performed only by the qualified personnel or Authorized DEFRO Service.

Inspection performed by the Authorized DEFRO Service during the warranty period is obligatory and is an indispensable condition to consider possible warranty claims.

## 13. TROUBLESHOOTING

Cause	Removal method
<b>Too low temperature of central heating system</b>	
<i>No power supply</i>	<ul style="list-style-type: none"> <li>➡ Check whether the boiler is connected to the supply socket</li> <li>➡ Check if the voltage is present in the system, switch on the fuse or main switch intended for supply of the system.</li> </ul>
<i>Too low central heating temperature has been set</i>	➡ Increase temperature for central heating mode on the boiler control panel (chapter 6.5)
<i>No fuel</i>	<ul style="list-style-type: none"> <li>➡ Check the condition of gas valve and set in opening position</li> <li>➡ Check whether the fuel is inside the system</li> </ul>
<b>Too high temperature of central heating system</b>	
<i>Too high central heating temperature has been set</i>	➡ Decrease temperature for central heating mode on boiler control panel (chapter 6.5)
<b>Lack of domestic hot water</b>	
<i>No power supply</i>	<ul style="list-style-type: none"> <li>➡ Check whether the boiler is connected to the supply socket</li> <li>➡ Check if the voltage is present in the system, switch on the fuse or main switch intended for supply of the system.</li> </ul>
<i>Too low domestic hot water temperature has been set</i>	➡ Increase temperature for domestic hot water mode on boiler control panel (chapter 6.4)
<i>No fuel</i>	<ul style="list-style-type: none"> <li>➡ Check condition of gas valve and set in opening position</li> <li>➡ Check whether the fuel is inside the system</li> </ul>
<b>Too high domestic hot water temperature</b>	
<i>Too high domestic hot water temperature has been set</i>	➡ Decrease temperature for domestic hot water mode on boiler control panel (chapter 6.4)
<b>Error message on the controller panel</b>	
<i>Loc message</i>	➡ Reset the boiler controller (chapter 8.8.1)
<i>Err message</i>	➡ Identify the error number and contact the manufacturer's service
<i>Atte message</i>	➡ If this message persists, it is required to contact the manufacturer service to restore functionality of the boiler

### 13.1. PROTECTION AGAINST FREEZING

If the boiler is not used during the winter or if the temperature may drop below 0 °C, then it is required to protect the boiler with the system against freezing of water. Emptying of the whole system is not recommended. It is recommended to mix the water in the system with a suitable solution protecting against freezing e.g. propylene glycol. Boiler controller has the continuously active function protecting against freezing, which controls the burner and pump to avoid decrease in water temperature in the system below 4 °C. Therefore, it is not recommended to shutdown the power of the boiler completely, particularly in a case when there is a risk of water freezing inside the boiler system.

### 14. DISPOSAL AFTER THE LIFETIME PERIOD

Before scrapping the device it is required to disconnect all components subject to selective collection of waste electronic and electric equipment for disposal purposes. These components include an electronic controller, motors of pumps, fans and other electric and electronic equipment with cables. Collection point should be specified by the municipal or commune authorities.

The other components of the boiler are made of material neutral for the environment and are subject to normal waste collection, mainly as steel scrap. After boiler end-of-life it is required to dismantle the parts connected with screws by their removal while the welded joints should be cut. Precautions and safety measures should be taken during the dismantling of the equipment by use of the proper hand and

mechanical tools and personal protective equipment (gloves, working clothes, apron, goggles etc.).

### 15. PRODUCT WARRANTY TERMS AND CONDITIONS

- Placing warranty statement, which contents corresponds to the provisions of this document, the Guarantor - manufacturer of the product - DEFRO Spółka z ograniczoną odpowiedzialnością Sp. k. with seat in Warsaw, 00-403 Warszawa, ul. Solec 24/253, entered in the Register of Entrepreneurs of the National Court Register by the District Court in Warsaw for the capital city of Warsaw, XII Commercial Division of the National Register of Entrepreneur under the number KRS 0000620901, NIP: 9591968493, REGON: 363378898, production plant: Ruda Strawczyńska 103 A, 26-067 Strawczyn provides the Purchaser with a warranty for products sold on terms and conditions specified below.
- The warranty refers to a condensation gas-fire boiler ..... with serial number ..... (subject of agreement - condensation gas-fire boiler) under the condition that the product has been fully paid. Due to the appropriate, proven and unified sales standards the warranty covers only a product purchased in the authorized retail outlets of the Guarantor or authorized distributors. A full list of the authorized companies is available at [www.defro.pl](http://www.defro.pl).
- When the total price is fully paid and the Purchaser gets the product, he/she will receive also a Warranty Card. If the warranty card is missing the Purchaser should immediately contact the Seller to obtain this document, while its lack has no influence on validity

and period of the warranty, but it can have an influence on correct, timely processing of obligations resulting from this warranty by the Guarantor, after meeting the requirements.

- 4) In order to allow efficient operation of the Guarantor, the Purchaser shall, immediately after receiving the product, send back a copy (scan or photo) of the correctly filled Warranty Card to the Guarantor (Ruda Strawczyńska 103a, 26-067 Strawczyn or email: serwis@defro.pl). The correctly filled Warranty Card has a date, stamp and signatures in the designated locations.
- 5) Along with the warranty terms and conditions and Warranty Card, the Purchaser shall receive also a user manual for the product, with specified boiler operating conditions, methods of its assembly and parameters related to the chimney, fuel and boiler water.
- 6) The Guarantor guarantees that the equipment works correctly provided that all conditions specified in the Operating Manual have been met, especially with respect to parameters applying to fuel, connection to gas, water and chimney system. The Warranty covers the product used as intended and in accordance with the information given in the user manual. The Guarantor shall not be liable for the effects of normal wear and tear of the product.
- 7) The Warranty is effective within the Republic of Poland for a period of two (2) years. The warranty period starts from the date when the product has been issued to the customer.
- 8) During the warranty period, the Guarantor ensures free of charge repairs - removal of physical defect of the product within:
  - a) fourteen (14) days from notification, if the removal of the defect does not require replacement of structural components of the product;
  - b) thirty (30) days from notification, if the removal of the defect does require replacement of structural components of the product;
  - c) Subject to subpara. 3 and 4 of this warranty terms and conditions.

If the defective product has been replaced with a new one or major repairs has been made after considering the warranty claim, then the warranty period shall start again from the moment of delivery of replaced or repaired product. If only a part belonging to the claimed product is replaced, then the warranty period for this part shall start again. In other cases, the warranty period is prolonged by a period when the operation of the product was impossible due to filed claim.

- 9) Notification of a need to remove the physical defect within the scope of the warranty repair (warranty claim) shall be made by the Purchaser immediately after stating the occurrence of such physical defect, but no later than fourteen (14) days from the date of detecting the defect.
- 10) Any fault is to be registered with the Guarantor (Ruda Strawczyńska 103a, 26-067 Strawczyn) by sending a complaint sheet contained in this operating manual, filled in and stamped by an authorized point of sale or authorized distributor. The warranty claim should include:
  - a) type, size of the equipment, serial number, number of contractor starting the equipment (data are given on the rating plate),
  - b) date and location of purchase,
  - c) brief description of damage,
  - d) detailed address and phone number of the Purchaser.
- 11) The Guarantor shall not be liable for exceeding the dates, mentioned in subpara. 9 above, if the Guarantor or his/her representative will be ready to remove the defect within the date agreed with the Purchaser and will not be able to perform the repair due to causes not attributable to the Guarantor (e.g. lack of required access to the equipment, lack of electrical power, force majeure, absence of the Purchaser etc.).
- 12) If the Guarantor, being on standby to remove the defect, will not be able two times to perform the warranty repair due to reasons attributable to the Purchaser, it shall be considered that the Purchaser resigned a claim given in the warranty notification. Another notification for the same defect in this mode is impossible.

- 13) If the claimed defect cannot be removed, and after three warranty repairs the product is still defective, but it can be operated, then the Purchaser has a right to:
  - a) reduce product price proportionally to the loss of functional value of the product,
  - b) replacement of the defective product with the product without any defects.
- 14) It is allowed to replace the product if the Guarantor states that its repair is impossible.
- 15) The Guarantor shall not be liable for the fitness of the product for use by the Purchaser, including an incorrect selection of the product for the size of the heated spaces (e.g. installation of the equipment with too small or too big power in relation to the demands). It is recommended to select the equipment in cooperation with the design office or the Guarantor. The Guarantor shall not be liable for loss of data stored in the equipment and for economic losses and lost profits.
- 16) The guarantor will refuse realization of Purchaser's claims resulting from this document in the case when:
  - a) damages are the result of water freezing inside the equipment
  - b) breaching or breaking of the seals will be stated,
  - c) damages are result of impurities in gas, water or air
  - d) it will be impossible to identify the product (that is conformity of the submitted product with the document describing the product, amended or illegible documents);
  - e) damages are a result of incorrect transport performed or ordered by the Purchaser,
  - f) the product has been modified, including arbitrary replacement of the individual components with non-original, used parts etc., repairs outside the Authorized DEFRO Services etc.
  - g) damages are mechanical, chemical, thermal and are not caused by defects in material and workmanship;
  - h) damages relate to wear and tear components: gaskets, washers, insulating pads, fuses etc.,
  - i) damages resulting from product usage inconsistently with the operating manual, that is especially when the incorrect operation of the equipment is a result of: contamination of gas or supply with inappropriate gas, lack of sufficient chimney draught or incorrectly selected power of the equipment,
  - j) notified defects are irrelevant and have no impact on the product value in use
  - k) water in the central heating system has been refilled when the equipment was hot.
- 17) The warranty does not cover:
  - a) scaling of boiler components;
  - b) damages caused by connected equipment, equipment or accessories other than recommended by the Guarantor;
  - c) damages caused by external events, i.a. action of force majeure;
  - d) damages caused by incorrect voltage;
  - e) damages caused by animals;
  - f) damages caused by incorrect filling of the system.
- 18) Warranty repairs, approved by the Guarantor, are performed free of charge. The Guarantor may charge the costs related to the warranty claim only if the claim is not considered, if the circumstances mentioned in subpara. 17 and 18 above have been stated.
- 19) The guarantee claim may be considered only if:
  - a) the time-limits mentioned in this document are kept;
  - b) the other warranty terms and conditions are met;
  - c) presentation of product proof of purchase - that is an invoice or fiscal receipt, the other proof of purchase, in compliance with the regulations;
- 20) Installation of the equipment may be performed only by the fitter with general licenses for installation, but it requires his/her entry and stamp in the Warranty Card.



- 21) First Start-Up of the equipment and all repairs and operations exceeding the scope of User operations described in the user manual, can be performed only by the Authorized DEFRO Service trained by the Guarantor.
- 22) First start-up is free of charge. Scope of First Start-up covers starting the boiler with adjustment of operating parameters. It does not cover the installation of the additional sensors and controllers in the system, such as: external sensor, room controller, mixing valve controller.
- 23) The warranty repair is performed in the location where the product is operated. If the notification relates to part of the product, including electric equipment/electronic regulator, fan etc., then the given part should be sent to the Guarantor at his/her expense. Return of the defective equipment is a condition to accept the claim and free of charge replacement of the device. Not returning the above-mentioned part within seven (7) working days will be subject to not accept the claim and to charge its costs to buyer.
- 24) Provisions of this document shall not limit, in any way, the rights resulting from the claim filed based on the statutory guarantee. The warranty does not affect the other claims of the Purchaser to which he/she is entitled pursuant to the provisions of law - including those related to non-compliance with the agreement. The purchaser can exercise powers from the statutory warranty regardless of powers resulting from the guarantee. If the Purchaser exercises the warranty rights, then the period for exercise the warranty rights shall be suspended as of a day when the defect has been notified. This period shall continue from date of Guarantor's refusal to execute the obligations resulting from the warranty or ineffective elapse of time for their performance.
- 25) For matters not covered with this document and the Warranty Card the provisions of the Civil Code art. 577-581 shall apply.

#### 15.1. TERMS AND CONDITIONS OF "48H SERVICE" WARRANTY

- 1) "48h service" covers the heating equipment manufactured by DEFRO Sp. z o.o. Sp. k.
- 2) Complaints are to be made at a retail outlet or directly at the Company's e-mail: e-mail: serwis@defro.pl, serwis@defro.pl, or by a letter to company's address.
- 3) The condition to accept the claim is sending the proof of purchase and correct filling of the warranty card with the claim document.
- 4) "48h service" warrants that DEFRO Sp. z o.o. Sp. k. will make every effort to ensure that the time required to remove the defects preventing/making seriously difficult use of the DEFRO heating equipment will not exceed two (2) working days from date of notification about the claim.
- 5) Defects removal time may be prolonged for reasons beyond the control of DEFRO Sp. z o.o. Sp. k., including among others: necessity to replace the structural components, lack of spare parts from the supplier, adverse weather conditions, force majeure.
- 6) Failure to meet this repair period shall not be a reason for any claims by the customers towards DEFRO Sp. z o.o. Sp. k. and Authorized DEFRO Service.
- 7) To facilitate contact with service, service hotline for Customers has been set up: 509 702 720 and 509 577 900. If you call on these numbers, you will receive the necessary information and help with any service issue.

***Please be advised that possible replacement of the component, claimed by the User, with the one in good working order is not equivalent to acceptance of the warranty claims by DEFRO and does not end the claim handling procedure. DEFRO reserves the right to charge the User with the costs of replacement/repair of the component, within sixty (60) days from date of removal of the defect, in a case when the component has been stated, as a result of the expert's report prepared after the repair, as damaged by the factors not attributable to the manufacturer (e.g. short circuit in the electrical wiring system, overvoltage, flooding, mechanical damages not visible with a naked eye, etc.), and which damages cannot be assessed by the service performing the repair during such repair in the boiler operation location. DEFRO shall issue an***

***invoice for replacement/repair of the subject components with a report attached. At the same time, we inform that non-payment for the invoice covering the above-mentioned costs within fourteen (14) days after issuing shall result in irrevocable loss of warranty for the operated equipment and such information will be entered in our computer supervision system over the equipment within the warranty period. The date when the bank account given on this invoice is credited shall be considered as a day of payment.***



In accordance with the terms and conditions stated herein we provide a warranty for the central heating gas boiler

DEFRO DCG COMFORT 25

type ..... operated in accordance with the operating manual.

Equipment manufacturing number\* .....

Gas type\*\* .....

User (surname and first name)\*\* .....

Address (street, city, postal code)\*\* .....

tel. .... e-mail\*\* .....

Sales date

Installation date

Start-up date

.....  
(stamp and signature of the seller)

.....  
(stamp and signature of the fitter)

.....  
(stamp and signature of the company starting the boiler)

The user confirms that:

- the equipment has been delivered complete;
- there was no defects during the start-up performed by the service company,
- received User and Installation Manual with the Warranty Card filled in;
- has been familiarized with the operation and maintenance of the equipment.
- undertakes to operate the equipment acc. to the recommendations given in the user manual

.....  
city and data


.....  
User signature

\* to be filled by the manufacturer

\*\* to be filled by the User

*The Customer and installation and service company agree, with a handwritten signature, to process their personal data for the needs of service records acc. to art. 6, section 1, letter a of the general data protection regulation of 27 April 2016 (OJ EU L 119, 04.05.2016).*



		THE PRODUCT DATA SHEET ACC. TO THE COMMISSION REGULATION (EU) NO. 813/2013 and 811/2013			
Contact data:		DEFRO Spółka z ograniczoną odpowiedzialnością Spółka komandytowa 00-403 Warszawa ul. Solec 24/253 Zakład Produkcyjny 26-067 Strawczyn Ruda Strawczyńska 103A			
Model:			DCG COMFORT 25		
Condensing boiler			YES		
Low-temperature boiler			NO		
B1 type boiler			NO		
Cogeneration space heater			NO		
Combination heater			YES		
Energy efficiency class			A		
Parameter		symbol	unit of measure	value	
Rated heat output		$P_{rated}$	kW	22	
at rated heat output and high-temperature regime (G20) (*)		$P_4$	kW	22,7	
at 30 % of rated heat output and low-temperature regime (**)		$P_1$	kW	7,6	
Seasonal energy efficiency for space heating		$\eta_s$	%	90,8	
at rated heat output and high-temperature regime (*)		$\eta_4$	%	86,6	
at 30 % of rated heat output and low-temperature regime (**)		$\eta_1$	%	96,5	
Auxiliary electricity consumption					
at full load		$el_{max}$	kW	0,100	
at part load		$el_{min}$	kW	0,026	
in standby mode		$P_{SB}$	kW	0,006	
Other items					
Standby heat loss		$P_{stby}$	kW	0,0489	
Ignition burner power consumption		$P_{ign}$	kW	-	
Emission of nitrogen oxides		$NO_x$	mg/kWh	24,9	
Declared load profile		L			
Daily electricity consumption		$Q_{elec}$	kWh	0,121	
Energy efficiency of water preheating		$\eta_{wh}$	%	86	
Daily fuel consumption		$Q_{fuel}$	kWh	22,51	

(\*) In high-temperature regime, the temperature of return water on the heater inlet is 60 °C, and supply water on outlet 80 °C.

(\*\*) Low temperature means 30 °C for condensation boilers and 37 °C for low-temperature boilers, in the case of the other heaters it means a temperature of return water 50 °C (on heater inlet).





service hotline

call us:

509 702 720  
509 577 900

**WWW.DEFRO.pl**

**DEFRO<sup>®</sup>**  
heating technology

DEFRO Spółka z ograniczoną odpowiedzialnością Spółka komandytowa  
00-403 Warszawa, ul. Solec 24/253

Manufacturing facility:

Ruda Strawczyńska 103 A

26-067 Strawczyn

tel.: 41 303 80 85, [biuro@defro.pl](mailto:biuro@defro.pl)

NIP 9591968493